ITTO PROJECT PD 85/01 REV.2 (I)

STRATEGIES FOR THE DEVELOPMENT OF SUSTAINABLE WOOD-BASED INDUSTRIES IN INDONESIA

Final Report - Study C

International Market Analysis

Sub-Studies

C1 Analysis of International Markets, Prices, Substitution and Competition

C2 Trade Trends, Barriers and Competitiveness of Indonesian Hardwood Products

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ABREVIATIONS AND ACRONYMS

AAC	Annual Allowable Cut
AD	Air-dried
ad hoc	Lat. To this
Ad valorem	Lat. In proportion to the estimated value of the goods taxed
AFTA	ASEAN Free Trade Area
APEC	Asia-Pacific Economic Cooperation
APKI	Indonesian Pulp and Paper Association
APKINDO	Indonesian Wood panel Association
ASEAN	Association of South East Asian Nations
ASMINDO	Indonesian Furniture & Handicraft Association
ATL	Accelerated Tariff Liberalization
b.ft	Board feet
BAPLAN	Planning Agency of the Ministry of Forestry
BDV	Brussels Definition of Value
Bill.	Billion
BJC	Builder's Joinery and Carpentry
BPS	Statistics Bureau
BRIK	Forestry Industry Revitalisation Body
C	Coniferous
C&I	Criteria and Indicators
CBD	Convention on Biological Diversity
CE	**C**onformité **E**uropéenne
CEPT	Common Effective Preferential Tariff
CESERF	Center for Social and Economic Research on Forestry
Cf.	Confer, compare
CGI	Consultative Group on Indonesia
CIF	Cost, insurance, freight

CIFOR	Centre for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
cm^3	Cubic centimeter
CMS	Constant Market Share
CNF	Cost and Freight
COC	Chain of custody
COMTRADE	United Nations Statistical Division's Database on International Trade
CPL	Continuous pressure laminate
Cum	Cubic meter
den	Density
DEPHUT	Ministry of Forestry
DEPPERINDAG	Ministry of Trade and Industry (MITI)
DfID	Department for International Development (UK)
DIY	Do-it-yourself
DRC	Domestic Resource Cost
DRCR	Domestic Resource Cost Ratio
EC	European Commission
e.g.	For example
EN	European Harmonized Standards
EU	European Union
EC	European Commission
Etc.	Lat. Et cetera
EUR	Euro, the common European currency
EVSL	Early Voluntary Sectoral Liberalization
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Database
FLEGT	Forest Law Enforcement, Governance and Trade
FOB	Free on board
FOEX	Finnish Options Exchange
FSC	Forest Stewardship Council
Ft	foot
FTAA	Free Trade Area of the Americas
FUP	Furniture parts
G	Gram
G8	Group of Eight (leading economies)
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
Glulam	Glue-laminated lumber
GOI	Government of Indonesia
GSP	Generalized System of Preferences
GPa	Giga-Pascal
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
Ha	Hectare
HDF	High density fiberboard
HPL	high-pressure laminate
HS	Harmonised System
IBRA	Indonesian Bank Restructuring Agency
IDR	Indonesian rupiah
i.e.	Lat. id est
IFRG	International Furniture Research Group
IMF	International Monetary Fund
Indo	Indonesian
IPB	Bogor Agricultural University
ISWA	Indonesian Sawmill and Woodworking Association
ITC	International Trade Centre
ITTO	International Tropical Timber Organization
IWPA	International Wood Products Association

JAS	Japan Agricultural Standards
KD	Kiln-dried
Kg	Kilogram
Kraft	Bleached sulphate wood pulp
LBWP	Low basis weight paper
LCA	Life cycle analysis
LEI	Indonesian Ecolabeling Institute
LPL	Low-pressure laminate
LPM	Low-pressure melamine
LVL	Laminated veneer lumber
M^3	Cubic meter
MC	Moisture content
MDF	Medium density fiberboard
MEA	Multi-lateral environmental agreement
MFN	Most-favored nation
MHP	Mixed hardwood pulp
Mill.	Mill.
MIT	Ministry of Trade and Industry
Mm	millimetre
Mm sq, mm^2	Square millimetre
MoF	Ministry of Forestry
MoU	Memorandum of Understanding
Mpa	Mega-Pascal
MT	Metric ton
MTCC	Malaysian Timber Certification Council
MUV	Monetary Unit Value
N	Newton
NC	Non-coniferous
n.e.s.	Not elsewhere specified
NGO	Non-Governmental Organization
NIC	Newly-industrialized country
NORSCAN	Nordic and Canadian pulp producers' stock inventory
Nr.	Number
NTM	Non-tariff measure
OECD	Organization for Economic Co-operation and Development
OBM	Original brand manufacturing
ODM	Original design manufacturing
OEM	Original equipment manufacturing
OSB	Oriented strand board
OWF	Other wooden furniture (miscellaneous)
PCR	Private cost ratio
%	Per cent
PCA	The Philippine Coconut Authority
Per se	Lat. by itself
P.O.C.	Part of China
PPM	Production and processing method
PPP	Public-private Partnership
PR	Puerto Rico
PROPENAS	National Development Program
PVC	Polyvinyl chloride
Q	Quarter of a year
R&D	Research and development
RCAI	Revealed Comparative Advantage Index
RFCO	Registered Foreign Certification Office
RIIA	Royal Institute of International Affairs
Rp	Indonesian rupiah
SBR	Seats of bamboo, rattan, etc.

SFM	Sustainable forest management
SPS	Sanitary and Phyto-sanitary Measures (a WTO Agreement)
SPWP	Secondary Processed Wood Products
SWF	Seats with wooden frames
T	Ton
TBT	Technical Barriers to Trade (a WTO Agreement)
TLS	Timber Licensing Scheme
TNC	The Nature Conservancy
TRAINS	Trade Analysis and Information System, of UNCTAD
TTJ	Timber Trades Journal
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organization
USA, U.S., US	United States of America
USD, US$, $	United States Dollar
USDA	United States Department of Agriculture
USVI	U.S. Virgin Islands
UV	Ultraviolet
Vice versa	Lat. the other way around
WALHI	Indonesian Forum on the Environment
WBF	Wooden Bedroom Furniture
WDF	Wooden doors and frames
WPF	Wooden picture frames
WSSD	World Summit for Sustainable Development
WTK	Wooden tableware and kitchenware
WTO	World Trade Organization
WWF	World Wide Fund for Nature
Yr.	year
3D, 3-D	Three-dimensional

EXECUTIVE SUMMARY

Structure and concentration of Indonesian wood product exports were evaluated to identify the position of each market share of the products exported to the world market. It was concluded that plywood was the dominant single export product. Indonesian secondary wood products had, however, a significant share in Indonesian exports of wood products (more than 40%). The price competitiveness of Indonesian wood products was relatively high but still the majority of the products tended to lose market share (in individual markets) over time despite growing total exports.

International market analysis

Key findings:

1. A global mega-trend in the 1990s was that exports of primary processed wood products from tropical forest declined, while exports of further processed products mushroomed. International trade of value-added wood products, and especially furniture liberalized, thereby increasing the import component of consumption, and creating more export opportunities for developing countries. International trade in furniture, BJC and profiled wood reached a total value of $33.7 bill. in 2000, up by 27% from 1996.
2. Indonesia is a significant supplier of many tropical forest industry products to diverse foreign markets. Based on COMTRADE data for 1998-2003 period, however, Indonesia has been losing market shares in many product categories, and mainly to China, in the recent years.
3. The biggest export values (and market shares in world imports – see brackets) were recorded in: tropical plywood – excluding blockboard & other laminated panels - $1523 mill (37,4%), chemical wood pulp $866 mill. (7,1%), ”other” wooden furniture $677 mill. (5,9%), sawn hardwood $523 mill. (9,3%), wooden seats $267 mill. (3,6%), wooden bedroom furniture $200 mill. (4,6%), rattan & bamboo seats $169 mill. (48%), profiled hardwood/mouldings $167 mill. (14,8%), assembled parquet, concrete shuttering, other BJC $144 mill. (4,4%), wooden doors & frames $120 mill. (7,5%), carvings $60 mill. (5,3%).
4. Indonesia ranked No. 1 as the source of tropical plywood and rattan and bamboo seats, and No. 2 in sawn hardwood, mouldings/profiled wood, and also in carvings and wooden doors. In other products Indonesia was usually among the 5-10 leading suppliers.

5. International market prices for most commodity products have remained depressed since the late-1990s, aided by the shock correction by the Asian economic crisis, and subsequent devaluation of the South-East Asian currencies, including rupiah.
6. Around 30-50% lower prices are recorded for Indonesia's and Malaysia's exports in 2001, compared to 1997 (FOB-basis researched by ITTO). A gradual recovery took place in 2002, and Q1-Q2/2004 showed some faster price hikes due to freight increases and physical constraints of supply.
7. Price comparisons on importer side showed that in most products, Indonesian exporters received lower than average prices for their products. US dollar-denominated price discounts tended to be the widest in labour-intensive products like carvings, doors and wooden bedroom and "other" furniture. On the contrary, Indo tropical plywood seems to have secured a price premium over competitors.
8. Exchange rate fluctuation has been an important catalyst for Indonesia's exports. During 1997, rupiah's fall fattened the profit margins of foreign currency-priced exports. This was most visible in wood pulp exports, where production costs were cut to almost one third, while international market price (Dollar & Euro denominated) remained firm.

Competition and substitution

Key findings:

1. Indonesian products still rarely compete on the highest market segments (prime products) because of quality constraints and insufficient product innovation. Value-added plywoods are an exception, as Indonesia has been able to meet the stricter quality requirements e.g. in the Japanese market. Wood carvings are a product group where Indonesian products are placed in the high-quality end of the market, but fetch only heavily discounted prices.
2. Between 1998 and 2002, Indonesia had been able to increase market share only in sawn hardwood, chemical wood pulp, wooden bedroom furniture and "other" wooden furniture. In other products it lost market shares, notably in profiled hardwood/mouldings (down 11.2%-points) and in tropical plywood (-7.4%-points). Market shares had slid downwards in all the other products.
3. Indonesia's deliveries of the studied nine forest product groups increased by $653 mill. over the period 1998-2002. Indonesia was not able to optimally keep pace with the booming trade, as its market shares typically fell at the same time.

4. The fast-growing export delivery from China was the single most important factor behind Indonesia's loss of market shares. China's market shares had risen particularly in the following products: wooden bedroom furniture (up 21.5%-points), wooden carvings (+15.1%-points), "other" wooden furniture (+12.7%-points), wooden seats, (+9.4%-points), profiled hardwood/mouldings (+8.8%-points), tropical plywood (+4.6%-points). It should not, however, be misinterpreted as the sole reason for Indonesia's falling trade performance.
5. Product substitution has been most frequently reported for Indonesian plywood by MDF (drawer backs), OSB, softwood plywood (structural plywood), and gypsum panels for ceilings. In Japan, packaging plywood has been losing ground to OSB. On wood material substitution, some plantation wood species have potential to push the natural tropical wood products "off-the-curve" into maturity and decline in their product life cycles.
6. The closest competitors of Indonesia come from within the South-East Asian region and China. Wood species and products offered tend to be similar, and international buyers treat the region as one supply base (particularly in furniture). Substitution happens easily between supplier countries on price versus quality reasons, and between products that serve the same end-uses (plywood losing ground to other panels), and between utility species (e.g. ramin vs. rubberwood). Engineered wood products and new processing methods can cause substitution.

Raw material situation

The production costs of Indonesian wood products tend to escalate as a result of log price increases (problems with availability and access) and other financial burdens such as those stemming from the economic reforms taken since 1998. Especially the new emerging levies at district levels and oil subsidy reduction have a role to play. The increase in log prices is mainly due to high competitive use of logs by wood industries oriented for exports. It has been exacerbated by the more frequent local log supply shortages and illegal log exports.

Key findings:

1. Plantation woods mature in many countries in Asia-Pacific to fill the deficits in the availability of wood from natural forests, and in fact are seen to supply most of any incremental wood usage in the future. Indonesia should try to embark on this trend, since

at least mediocre wood properties can be achieved from many plantation woods, and there is ample potential for overcoming the more serious quality handicaps through immediate improvements in wood drying, jointing and edge-gluing technologies, and wood preservation and finishing of products.

2. Efficient harvesting and low mill-gate price of plantation wood will prevail in primary processing; together with low labor cost it confers initial competitive advantage to producer countries. Part of the gains from lower raw material costs will be passed to the final consumer as inexpensive products, and this will increase the competitiveness of the wood products in the market and probably reduce the rate of substitution of wood by synthetic materials. In absolute and relative terms profit margins at the producer side will decline further, what calls for more domestic further processing to better capture net value added.

The above factors suggest that the existing marketing strategies for wood products should be adjusted to current realities and future development trends. The log export ban policy may well support the price competitiveness of Indonesian wood products, but it comes with side effects such as persistent structural oversupply, and a dampened product image unless logs originate from sustainable forestry. The effect of harder price competition and relatively high tariffs for some products suggest that wood products industry should strive at a processing technology upgrade to meet the challenges on the availability of logs, and to acquire maximum benefits of economies of scale (in primary processing) and increase processing efficiency. The growing environmental concerns suggest that log supply should depend - without exceptions - on sustainable forestry, verified with certification and communicated through labeling.

Free trade vs. tariff and non-tariff barriers

Theoretically, trade liberalization expands the volume of economic activity, and especially that of trade. Many studies lend support to one of the basic assumptions of trade liberalization, that most of the consumers (predominantly in industrialized countries) will enjoy lower prices, what contributes to higher welfare. This benefit is partly shadowed by the fact that sometimes producer country consumers may not gain at all. The producer country welfare may even have a tendency of going down instead of increasing.

There is no clear mechanism of compensation from those who gain to those who suffer, what underlines the problematic of equal sharing of benefits and revenues of liberalizing world trade. Regional trade agreements (with tariff reductions) do have similar volume enhancing and price reducing impacts, but to a lesser degree and less consistently.

On Indonesia's case, it is likely that opening up makes the exporters more vulnerable to the harsh realities of the competitive international markets, including competitive imports to Indonesia. On the other hand, trade liberalization may open up new opportunities if the country manages its resource more sustainably and establishes competitive production factors.

Key findings:

1. Tariff barriers have been in general lowered, and the trade liberalization's pros and cons are largely on hand for Indonesia. On the contrary, non-tariff measures have been increasing, affecting Indonesian exporters significantly e.g. through FLEGT initiative and certification demands. NTMs more severe for developing country exporters, who aim at the markets of the developed countries, than *vise versa.* This is especially true for developing countries trying to enter the "rich" markets (Canada, EU, Japan and USA).
2. GOI has imposed log export ban for the time being. Primary and further processing industries enjoy cheaper prices of wood raw material than they would under foreign competition, so the government loses a relative share of revenue (royalty). This policy may help maintaining the inefficiency of primary and further wood processing industries, and should be reconsidered.
3. Import tariffs on especially plywood and some other products tend to be relatively high in some major importing countries. There have also been intensifying campaigns on environmental issues in major importing countries (EU and USA) asserting that the wood products traded must be made of raw material legal and come from sustainably managed forests. Demands for certification of forest management, chain-of-custody and legality will not be met without additional costs.
4. Under free market mechanism of logs (no export ban or no export tax), Indonesia's sawnwood industry would work profitably. Alternatively, imposition of export tax as much as 10% on logs would increase the profitability of sawnwood industry up to 14%. The higher the export tax on logs, the higher the profitability of the sawnwood exporters.

5. The profitability of plywood industry will be negative under free market mechanism. If 10% export tax is set on logs, it results in the profitability of plywood industry improving by 28%, but still remaining in red. This implies that the plywood industry needs domestic price protection of logs, unless it undergoes a major restructuring.

Indonesia's competitiveness

Based on the dynamics of the development in Indonesia's wood industries since the 1980s, one can say that its position reflected comparative advantages. But these have a limited lasting (as long as low-cost resources existed widely in the country) - and not yet anything of a kind of dynamic competitive advantage that should be its target – is in sight.

Key findings:

1. Measurement of Indonesia's competitive advantages in forest products in the international trade through indicators like private cost ratio (PCR), revealed comparative advantage index (RCAI), and constant market share (CMS) gave somewhat contradicting results. PCR showed that sawnwood had a better competitive advantage than plywood or mouldings. RCAI results indicated that plywood enjoyed of a great competitive advantage, even though RCAI of plywood declined between 1997-2001. Sawnwood was less competitive in the world markets, but its RCAI clearly improved over the years 1997-2001.
2. In the case of secondary processed wood products bamboo/etc seats/chairs, wood carvings, "other" wood furniture, and wooden bedroom furniture all showed a high and increasing RCAI. Their results indicate ever-improving competitive advantages in the world markets.
3. CMS analysis of plywood export growth to ten major importing countries implied mixed reasons for Indonesia's success. Plywood export growth in 1998-2001 was attributed to real competitiveness just in three countries, Canada, France, and the UK. Indonesia's plywood export growth to China in 1998-2001, was mainly (94.15%) caused by general increase in import demand, and just a small 5.85% part of its export growth was attributed to competitiveness. Additionally, CMS analysis concluded that sawnwood export growth

in 1998-2001 to ten major importing countries was principally attributed to its competitiveness in just five countries.

Key issues for policy consultations

The following key questions for policy-making were collected from the two sub-studies and discussed during the project work. Reflections of the analysis are suggested as tentative answers.

Issues from international trade perspective:

1. Does the international market pose limitations to Indonesia's forest products exports? *Less from the quantitative point of view, but more from the qualitative point of view. Markets (demand) keep growing and Indonesia appears quite price-competitive, but the promising trade opportunities are inhibited by more stringent environmental and legality requirements.*
2. Does Indonesia explore new markets actively enough or have some countries or niches gone unattended for? *Indonesian industry appears to be a passive price and order taker and does not very proactively explore new markets, or adjust products to diverse exports.*
3. Is the present structure of exports economically optimal, i.e. does the raw material get routed competitively to the industry that has the best wood paying capability for it, provides high value added on it, and generates "enough" of foreign exchange of it? *Roundwood market is a captive one, where competition and dynamism has been eliminated. Industry branches are not working transparently, so wood paying capability and profitability levels do not unfold easily.*
4. Is the present structure of exports sustainable, i.e. operates profitably, shares revenue for societal benefit, provides employment, and not to the detriment of the environment? *By definition and through empirical evidence, it is not sustainable.*
5. Is Indonesia a price taker or an active market developer with enhanced power thanks to its high market shares? *Indonesia still holds a strong influence in plywood trade, but in general it lacks concerted market development efforts in most of the other products.*
6. Should there prevail stronger policy and economic incentives to support secondary processing and higher value-added products? *Generally the answer is yes, but one should*

not ignore the adverse impacts on primary processing and the challenge to develop secondary/tertiary processing. Benefits would outweigh problems in the long term.

7. Should Indonesia seek to transfer from natural tropical wood into plantations-based exports? *It will be inevitably compelled to do so, but still the returns on the most valuable tropical wood that can be sustainably harvested should be maximized. Processing and products need adjustment during the transfer onto the low-cost plantation wood segment of the markets.*

Issues from competitiveness and trade policy perspetive:

1. Is Indonesia's loss of market shares an indication of eroding competitiveness or just reflection of China's emerging role as "the factory of the world"? *Both, as Indonesia's labor productivity is probably falling further behind that of China, Vietnam, etc. Indonesia has few means to complement such a loss, as its raw material base is breaking.*
2. Is Indonesia losing ground in the international trade foremost due to resource constraints, environmental image, or product quality (standards)? *The order seems correct, but all are inter-twined and solution must address all of these hindrances.*
3. Are Indonesia's exporting procedures and exporters as prone to illegality as perceived in the international markets? *Yes (but generalizations are to be avoided): the Report on Trade Discrepancies is a warning signal and would call for immediate action. In addition, there are reportedly escalating port handling fees that can not be justified. Inefficiency, red tape and corruption are often mutually reinforcing.*
4. Has Indonesia adapted its export products and industries sufficiently to become more competitive in the international markets (is there still room for "organic" improvement without major industry restructuring)? *Product adjustment and product placement is rarely done, so room to do so in the future is vacant.*
5. What are the key tariff and non-tariff measures and other market access hurdles that steer Indonesia's role as exporter and source of imports? *There are less gains achievable from lowering of tariffs (much of the liberalization has been done), but NTMs will continue to evolve, as Indonesia's experiences with the recent CITES-listing of ramin and importer boycotts in Europe would implicate.*
6. What is the optimal blend of export taxes, fiscal incentives and other measures for allocating efficiently wood products with different degrees of value-added between domestic and export markets? *Experiences from most countries would indicate a free*

market mechanism leading to the greatest efficiency. A key question is whether GOI has the courage to allow it, and what type of buffers are needed to iron-out imperfections.

7. How can Indonesia make a balanced choice of policies between log export ban, exports with a tax regulation, and unregulated trade under the on-going trade liberalization processes? *Economic impact assessments with appropriate sensitivity analyses, would prepare ground for such an endeavor: long-term consistent policy guidance has to be chosen instead of ad hoc measures.*

Recommended strategies of study C

The overriding **goal** of a new trade/market-based strategy for the Indonesian wood-based industries could be defined as follows.

"To help Indonesian wood-based industries adapt to the changing economic, societal and environmental conditions of the trading community in abroad and domestically, and operate profitably based on flexibility, increasing net value-added, and undistorted competition."

A strategy comparison matrix was used to evaluate three alternative strategies against a benchmark (*Status quo*). The proposed alternative was defined as **"Undistorted Free Market"**, whereby only **the smallest necessary (safeguarding) measures under the WTO / AFTA trade regimes would be applied to guide trade**. The possibility of trade-distorting interventions by the government would be barred. As the most liberal alternative, this strategy will initially stir resistance among many policy-makers. But it would also guarantee the clearest recipe for change, and importantly, it would work in two ways, i.e. **bring market-driven development to both exports and imports**. If implemented in conjunction with the option two **(lending support to value-added exports)**, it would have a better chance of succeeding the scrutiny and steer Indonesian industry on a more sustainable path.

Guiding principles of change

Simple guiding principles are proposed for steering the change in order to achieve the goal of strategy development and implement the actual recommended strategy. From the trade/market perspective, the essential guiding principles would include:

1. Legality (throughout the forest products value chain, from the forest to the markets)
2. Equal ability to compete (clear trading rules and non-captive market structures)
3. Transparency (access to market intelligence and accurate trade reporting)
4. Accountability (free markets reward efficiency, but penalize inefficiency)

Strategy steps for achieving a more remunerative positioning of Indonesia in the international markets

A break-away from status quo:

1. GOI should decide whether it wants to continue pursuing centrally-planned industry restructuring, where failure is on hand already.
2. Evaluate options: rely fully on market forces, or aim at central/local government controlled restructuring by fostering domestic demand, or supporting value-added processing for exports.
3. Choose supporting action: decisions to maintain, modify or remove Indonesia's trade restrictions and export taxes on wood commodities.
4. Admit and re-evaluate the failure of incentives for plantation establishment, and debt restructuring.

Permanent change of course:

1. Intensify marketing, product placement and distribution channel participation in order to find more remunerative markets and new trade opportunities.
2. Reduce existing export industry capacity to reflect resource constraints, re-train exporting community away from mass-market supply (export diversification and gradual downscaling).
3. Consolidate the fittest exporting companies into stronger and fewer players; enhance integration and alliances.
4. Create long term strategy and incentives to move away from primary processed wood product exports to that of secondary processed products ("earn more with less").
5. Re-orient part of export flows towards domestic market, which is coming under intensifying foreign competition, partly supplied by products manufactured abroad of illegal logs from Indonesia.
6. Guide the industry towards plantation-based raw material supply and mixed raw material stock to optimize remaining resource, and if feasible, import the deficit.

Strategy steps for achieving competitiveness and consistent trade policy

A break-away from status quo:

1. Indonesia should abandon its historic specialization in international trade on the basis of primary resource endowment (labor, raw material, energy) – as this reflects a static approach. Instead it should accept competitive advantage as a dynamic target, relating to the set of institutions and economic policies supportive of sufficient rate of economic growth – motto: national prosperity is created, not inherited.
2. There are three transitions to be made: (i) from traditional specialization to factor-driven competitiveness, (ii) to investment-driven competitiveness, and (iii) innovation-driven competitiveness.
3. Consider phasing out log export ban and opening the domestic log market to legal external competition (industry enters free competition for logs).
4. Adopt a new company taxation and investment policy, which would encourage further processing before exports.
5. Embark more determinedly on forest certification and verification on legal origin of wood to shrug off the reputation of "environmental plunder" from Indonesia. This requires improving the capacity to **verify and control** legality and sustainability of wood flow in trade (chain-of-custody certification, log tracking, etc.).

Permanent change of course:

1. Carry out company audits and set screening criteria for a radical forest industry consolidation to escape "sunset industry" image: allow the weak links crack.
2. Strengthen industry associations and industry discipline to firm export prices in sectors where Indonesia is influential, but avoid market manipulation of the past.
3. Eradicate corruption in the wood supply chain and related tampering of trade documentation. Reduce red tape, streamline inefficient export procedures and services.
4. Establish a new body or strengthen an existing one to assume the task of being a transparent, third-party accredited verification body for **legality**. This is an urgent task.
5. Supporting action: apply for maximum support (technical, financial) from the EU and other trading partners willing to help implementing better forest law enforcement, governance and trade initiatives (under FLEGT umbrella).

6. Embark on foreign joint ventures, investments and transfer of technology and know-how to save the fittest part of the industry, and "import sustainability" if needed.

Supporting policy package

Without the creation of innovative support mechanisms and unbiased financial incentives, the agenda for income creation from, and sustainable use of, forests will be difficult to realize. Enabling economic environment, cultivation of competitive and entrepreneurial attitude and careful addressing of structural weaknesses, could be the center pillars for enhancing the production capability and competitiveness of wood product exporters.

The government policy framework should ideally ensure the following:

1. Consistent policy for supporting **sustainable and legal** raw material procurement and further processing instead of regulating it by complex rules and ad hoc restrictions.
2. Catalytic tax concessions or similar fiscal incentives to facilitate restructuring (to be phased out upon self-sufficient industry).
3. Consistent, transparent and predictable import and export regulations.
4. Rationalization of import tariffs on raw materials and equipment.
5. Improvement of transportation, communication and information infrastructure.
6. Strengthening of supporting institutional infrastructure for industries (associations, research & development institutes, education and training, export promotion offices, standardization, certification and labeling, verification body of legality, etc.).

The private sector should always assume the primary actor's role in putting the policies into a maximal use. Government's role in supporting export marketing tends to be more subtle, and private sector cannot be made dependent on it.

1 INTRODUCTION

1.1 Purpose of the report

Sustainable forest management is a cornerstone of the ITTO Yokohama Action Plan, and the Government of Indonesia has placed a high priority on achieving conditions where international trade in tropical wood products originates from sustainably managed forests only. This ITTO project PD 85/01 Rev.2 (I) was conceived as a result of the recommendations of the IX Consultative Group on Indonesia (CGI) Meeting in 2000. The project also takes into account the recommendations of the ITTO Technical Mission to Indonesia (2001). Its aim is to assist the government in finding mechanisms and criteria for downsizing and restructuring Indonesia's wood-based industries in order to balance supply and demand from the local industry and to improve the competitiveness in the sector.

The three outputs for accomplishing such a challenging task are shortly summarised in the following:

- Output A: Log Supply Capacity: six sub-studies to assess the log supply capacity in terms of current and future trends, logging costs in production and plantation forests, and including current regulations and domestic log markets and imports,
- Output B: Wood-Based Industry: three sub-studies to assess the cost structures, efficiency and policy options of the wood-based industry, and
- Output C: International Market Analysis: two sub-studies including trends in the world markets for selected products, Indonesian exports and imports, its competitiveness and tariff and non-tariff barriers affecting trade performance.

This is the Final Report by Study Group C under the said Project. The two sub-studies were the following:

Study C1: Analysis of International Markets, Prices, Substitution & Competition

Purpose: To assess the developments in the international markets (market developments, prices, competition and substitution) as the competitive environment for Indonesian wood products.

Study C2: Trade Trends, Barriers and Competitiveness of Indonesian Hardwood Products

Purpose: To analyze Indonesia's wood product trade trends, trade barriers, comparative and competitive advantages of Indonesia, implications of trade policies and trade liberalization on industries, and to assess the impact of export taxes and other measures on demand for Indonesian wood products and government revenue.

The Consultant Team comprised: Mr. Jukka Tissari (International Consultant C1 & C2), Mr. Satria Astana (Advisor, Main Author C2), Dr. John FoEh (National Consultant, C1) and Mr. Iman Santoso (Advisor, C1). The Team would like to acknowledge its gratitude to Dr. Thomas R. Waggener (International Consultant, Study Group A) and Dr. Khamurudin Mohd Noor (International Consultant, Study Group B) for their valuable contributions. Moreover, the work would not have been possible without the steering and advise from Dr. Agus Sarsito, Director of CESERF, Dr. Doddy S. Sukadri, Project Co-ordinator, and Dr. Hariyatno Dwiprabowo, Special Advisor. Finally, all the support staff at Project Office is warmly thanked for their dedicated assistance.

1.2 Background

Indonesia is biologically, culturally, and geographically diverse. It controls a wealth of natural resources, particularly oil, gas, and timber and is now facing many challenges in capitalizing on these to bring prosperity to the average person. In the case of forestry sector incomes, the best potential has been reaped already. Current political events are going to dictate how Indonesia is going to succeed in adjusting its forestry sector into a new role in the national economy. The biggest step towards achieving this goal has to do with stability. The current level of stability (or in a sense the lack of it) makes economic improvement very difficult for the time being. Political turmoil in recent years has left the government weak, corrupt and disorganized. The lack of effective government regulation has translated into unchecked exploitation and destruction of Indonesia's natural resources, particularly in the forest products sector. (Impact assessment…, 2004)

Over the past decades, the utilization of natural production forests has undoubtedly supported the national economy, especially in increasing foreign exchange, employment, value added, and economic growth. In year 2001, export value of forest products, of which majority was

harvested from natural production forest accounted for US$ 4,445 bill. (BAPLAN, 2002; DEPPERINDAG, 2003). Of this amount, processed wood products accounted for 98.2%, while logs and non-timber forest products made up only 1.5% and 0.2% respectively. In the same year, total value of non-oil exports accounted for US$ 43,685 bill. (DEPPERINDAG, 2003). Of this amount, forest products exports contributed 10.2%, or ranking third of national exports after electronics and textiles exports which contributed of 14.8% and 17.5%, respectively.

Although forestry contributes only a small part of total gross domestic product (GDP), it generates large numbers of jobs in harvesting, primary processing and secondary processing enterprises and is of great importance to small-holder livelihoods and the informal economy (Table 1.1).

Table 1.1 GDP by Industrial origin (% distribution)

Industrial origin	2000
Agriculture, livestock, forestry and fisheries	16.6
of which forestry	1.6
Manufacturing industry	26.4
of which wood and wood products	1.0
of which paper and paper products	1.1

Source: BPS

The decentralization euphoria in Indonesia has brought about duplication of authority. This shows up in overlaps between the central and local governments, conflicting rules, weak enforcement of regulations, avoidance of payment of legitimate fees and royalties, etc. These factors have all resulted in high costs, lower economic efficiency, corruption, and ultimately have weakened the wood product's international competitiveness.

The decline in monitoring capacity by central government and an ineffective enforcement of the basic concession regulations has lead to weak economic or regulatory incentives for obeying the central authority. This hinders the functioning of normal market-based structures in the country. These should work better as a prerequisite for economic efficiency in harvesting, production and markets. Systematic collection and transparency of data on the wood-based sectors has weakened, resulting in a broader inaccuracy, which cannot serve for either policy or operational decision-making.

1.3 Challenges in the forestry and wood sector

In order to depict broadly the framework of dynamic market conditions, under which the wood processing companies from the tropical countries operate and compete, it is worthwhile to generalize some of the market drivers that shape up the rules of the survival game in the globalized world markets (Table 1.2). The compilation is rough and non-exhaustive in the sense that industries adjust to the given conditions differently in various market segments and product sectors. But enough of common threads can be identified for pulling the table together, and drawing some examples to support it.

Table 1.2 Logic of market drivers in tropical wood products

Traditional end-uses	1. Sawnwood, plywood for construction 2. Builder's joinery and carpentry 3. Low-cost furniture
Market drivers	1. Rainforest & social concerns (sustainability, responsibility) 2. Consumer fashion: light-colored woods have dominated for long 3. Synthetic (aluminium, steel, PVC), natural (fiber plants, agro-waste) substitutes 4. Substitution between wood species (temperate hardwoods, fast-growing plantation woods, softwoods) 5. Consolidation and globalization of (mainly) northern forest industry & distribution
Strategic response by industry	1. Certification of sustainable forest management and chain-of-custody 2. Material combinations (if you can't beat substitutes, join with them) 3. Engineered wood products and more efficient use of residues 4. Move to higher value-added products from plantations 5. Industry restructuring 6. Clustering and value chain approaches 7. Widening product mix (diversification) 8. Entering into outsourcing and sub-contracting: the lowest-cost bases
Impacts of prices on development	1. Roundwood and commodity product real prices are in constant decline (plus sudden fall e.g. after Asian crisis). 2. Some part of the gains of lower raw material costs will be passed on to the final consumer (lower selling prices of processed products). 3. This increases the competitiveness of wood products in the marketplace and probably reduces rate of substitution. 4. But there are upward price pressures that result from internalizing environmental and other up-grading costs (demanded by markets forces, international private and intergovernmental lenders to boost exports or to service debt). If these cannot be transferred in full, a "desperation production" cycle may occur. 5. In absolute and relative terms profit margins at the producer side will decline. 6. Race to the bottom? Yes, if stay in mass markets: do-or-die under price erosion No, if products are diversified: product development, clever marketing, lasting total competitiveness, etc.

Source: Tissari, 2003: in UNECE-FAO Timber Committee Forest Products Annual Market Review 2002-2003

The empirical testing of this framework was not done during this project, but the stakeholder consultations carried out appear to lend some support to it anyway. Based on interviews for this report, Indonesian wood products industries are facing among others the following challenges:

- The log supply and demand "shortage" or market disequilibrium, which has been partly overcome through additional logs supplied through over-cutting of natural forests
- Poor or declining prices for plywood and most primary processed wood products in major international markets, and increasing competition and material substitution
- Old and inefficient machinery at wood processing mills, running well below capacity
- Log exports from Indonesia that provide, according to Indonesian industry representatives and trade press, affordable raw material to Indonesia's competitors in the major plywood markets (but this has been denied e.g. by Malaysia Timber Industry Board)
- The decentralization process is progressing very slowly, creating a lack of clear control and law enforcement in forestry sector
- Conflicts over regional interests and community rights for a share of forestry income
- Demands for certificates on meeting technical standards, legality of wood and sustainable forest management, and bans to import or use tropical wood products in some markets
- Differential tariff rates for hardwood products and some non-tariff barriers
- Direct boycotts and bans on Indonesian products in the international markets

Some of the most tangible physical constraints for the wood processing sector are:

- The production of Indonesian hardwood roundwood in 2002 has decreased to around one quarter of (8 mill. m^3) from 30 mill.s of m^3 in the mid-1980s.
- Industries can no longer use their existing capacity in full to produce wood products, due to the insufficient supply of raw material.
- At the same time, illegal logging, transmigration and the very slow rate of development of forest plantations have become a serious problem for sustainable forest management.
- The improvement of peoples´ welfare will increase the domestic demand of wood as the raw materials for buildings, furniture, etc.

- Log imports to feed the existing capacity of Indonesian wood-based industries seems unrealistic cost-wise.

In conclusion, the forest products in Indonesia remain under-valued, caused mainly by badly functioning domestic markets and illegal domestic and foreign trade. Secondly, the perceived comparative cost advantages (mainly affordable log prices, high wood quality) have been associated with natural production forests, and are presently vanishing at a fast rate. The image of Indonesia's forestry sector has become a country risk for many operators in the international value chains of wood products.

To actualize how Indonesia is (more and more frequently) perceived in the international market, a citation follows:

Source: Environment News Service, San Francisco, California, March 22, 2004. *"Rainforest Action Network is seeking an immediate corporate embargo on products from Indonesia's rainforests. The San Francisco based organization sent a letter to 163 U.S. tropical wood importers and members of the International Wood Products Association asking them to consider such a ban to protect the last remnants of these forests….*

Over the past two decades, the volume of timber exports from Borneo has exceeded all wood exports from tropical Africa and South America combined. Most legal Indonesian concessions have been depleted of their harvestable timber and abandoned by loggers who have illegally expanded their uncontrolled clearcuts into protected areas…

…Indonesia is ground zero for illegal logging,…corrupt logging companies are pillaging Indonesia's virgin rainforests and turning Borneo into a barren wasteland. American corporations that are trading in illegal Indonesian timber are as guilty as the criminals who supply them."

This situation requires clear and transparent corrective survival strategies of forests and peoples depending on them. A balanced consolidation and restructuring of the entire forest industry sector is a necessity. Rationalization need of the wood processing sector has been inevitable since the economic crisis in 1997-1998 due to unsustainable debt levels, significant

over-capacity and resource famine, coupled with falling commodity wood product markets. But the necessary structural correction has been postponed over and over again to keep the industry running till the bitter end. Voluntary restructuring that would have been possible 10-15 years ago with more strategic eye-sight, is now turning into involuntary downscaling back against the wall.

1.4 Statistical foreword

COMTRADE is the UN trade database showing trade by direction for over 100 countries since 1960s for all SITC and HS codes. It is based on national customs statistics, and depends thus on the quality and consistency of national trade data reporting. While COMTRADE has provided much of the data in this report, it has limitations such as different volume units reported by various countries (mainly the USA; Canada), and in some cases volumes that are totally lacking (same countries). Therefore, the market shares are established according to trade values (US-dollars) in the first place, and in volume units whenever made possible by the statistics. The most commonly applied volume unit in COMTRADE is always metric ton. Complementary analyses have been extracted from Indonesian trade associations, literature and trade press in order to enrich the report.

The extractions have been based on 30 OECD countries, which represent usually 75%-85% of world trade. They are the leading economies of the industrialized world: Australia, Canada, Finland, Greece, Ireland, Korea, The Netherlands, Poland, Spain, Turkey, Austria, Czech Republic, France, Hungary, Italy, Luxembourg, New Zealand, Portugal, Sweden, the UK, Belgium, Denmark, Germany, Iceland, Japan, Mexico, Norway, Slovak Republic, Switzerland, the USA. Additional countries, which were presumed to have importance for Indonesia were added, namely: the United Arab Emirates, Saudi Arabia, Malaysia, Russia and China. This trading area is referred in the report as “the world”.

The trade data analyzed from COMTRADE only captures years 1998-2002. The data batches have become extremely large in volume, as the study coverage was set to 75% of world trade in the nine selected product groups, and at least 5% market shares held by reported suppliers. In some products, Indonesia’s role in world trade remained smaller than this treshold percentage required, but the summary tables present Indonesia in any case. In any case,

Indonesia reached this 5% market share in all product groups on at least some individual markets.

Competitiveness has been analyzed according to certain mathematical indicators, and the key results have been compiled in this report with short descriptions of methods used.

Table 1.3 Correspondence between Indonesian Industrial Classification Code and Harmonized System Trade Nomenclature

	KODE KLASIFIKASI INDUSTRI – INDUSTRIAL CLASSIFICATION CODE	HARMONIZES SYSTEM (HS) TRADE CLASSIFICATION
33111	Industri penggergajian – *Sawmills*	Hardwood sawnwood of tropical origin HS codes: 4407.24, 4407.25, 4407.26, 4407.29
33112	Industri moulding dan komponen bahan bahan bangunan – *Manufacture of moulding and building components*	Hardwood mouldings (profiled wood) HS 4409.20 Wooden windows 4418.10, wooden doors 4418.20, Parquet panels 4418.30
33113	Industri kayu lapis – *Manufacture of plywood*	Hardwood plywood with tropical wood HS 4412.13 Laminated wood of tropical wood HS 4412.92, Veneered panels with tropical wood HS 4412.22
33114	Industri kayu lapis laminasi, termasuk decorative plywood – *Manufacture of laminated board including decorative plywood*	
33115	Industri kayu lapis aneka inti – *Manufacture of block board, particle board and the like*	Particle board HS 4410, Fiberboard HS 4411
33120	Industri peti kemas dari kayu kecuali peti mati – *Manufacture of wood containers except coffin*	Wooden cases, boxes, crates, similar HS 4415.10, Wooden pallets, box pallets, etc. HS 4415.20
33140	Industri kerajinan ukir-ukiran dari kayu kecuali mebel – *Manufacture of wood carving except furniture*	Wooden statuettes and ornaments HS 4420.10
33211	Industri perabot dan kelengkapan rumah tangga dari kayu – *Manufacture of furniture and fixtures mainly made of wood*	Wooden furniture and parts thereof HS 9401.61, 9401.69, 9403.30, 9403.40, 9403.50, 9403.60, 9403.90 Furniture of bamboo, cane etc. HS 9401.50, 9403.80
34111	Industri bubur kertas – *Manufacture of pulp*	Wood pulp HS 47

1.5 Structure of the report

In order to describe properly the market dynamics for primary and further processed wood products for Indonesia, this report is structured as follows:

- The second chapter will provide an outlook on trends in international trade of the chosen product groups.
- The third chapter explains how Indonesia is positioned as a supplier for the import markets.
- The fourth chapter reflects the structure and market focus of Indonesian wood product exports.

- Comparative and competitive advantages, their factors and drivers, and challenges to access the world markets, reflecting the country's industry structure, quality and design of products, etc. are outlined in Chapter 5.
- A closer look at export taxes and other policy measures is given in Chapter 6.
- Impacts of various trade restrictions (tariff, non-tariff measures, demands for legality & sustainability, other impediments, etc.) on Indonesia's competitiveness are assessed in Chapter 7.
- Finally, a conclusive chapter No. 8 draws together conclusions and recommendations for sustainable strategies from the trade viewpoint for restructuring of the Indonesian forest industries.

2 GLOBAL TRENDS IN INTERNATIONAL FOREST PRODUCTS TRADE

2.1 Overview on trade vs. deforestation

Deforestation and illegal logging have remained in the limelight of the debate on tropical forests for more than two decades. But due to their utility value for the mankind, the trade on wood products continued to expand steadily until the late 1990s, when both economic woes of tropical countries and resource constraints caused the steady growth to stumble. The main impetus for growth has been the economic value of forests, and their natural endowment as a primary source of revenue for economic development. Deforestation is driven by a range of factors stemming from the growth in human population and its obsession with accumulating wealth. Reflections of this, domestic government policies for agriculture, cash crops and economic criteria for land use have exacerbated forest degradation. More recently, the role of intensive "mining" of forests for timber, and the international demand for wood-based products, has been acknowledged to have played a larger than previously admitted role. More inter-regional and international policy initiatives have been launched to tackle trade and consumption related threats on forest.

The total value of global trade of forest products (evaluated at imports) has been estimated at about 160 bill. USD in the year 2000. The value of the trade in basic forest products has increased by about 75% in real terms since 1970 (FAO 1997). The value of global trade in tropical timber is estimated at about 16 bill. USD, or one tenth of global trade (2000).

In spite of its limited share of production, trade has been seen by some observers as a major factor contributing to tropical deforestation, particularly in developing countries (Dudley *et al*. 1995). In a number of tropical countries in Southeast Asia, export oriented production has apparently accounted for a significant share of forest loss and degradation. In addition to direct impacts, indirect effects, such as opening up forest areas for encroachment, can become or trigger underlying causes of deforestation. (Market Access…, 2003)

Trade is a powerful driving force behind the legal and illegal exploitation of forest around the globe, and more especially in tropical countries. International trade is without a doubt driven primarily by Western and Asian consumption patterns. The former "old" markets are moving (perhaps too late) into more responsible direction in their consumption, while the latter "new"

markets continue to foster unabated growth in consumption patterns. Many emerging market economies are among the largest consumers of tropical wood and wood-based products.

The production of tropical industrial roundwood (logs) from the 31 ITTO producer countries decreased from nearly 126 mill. m^3 in 1998 to around 121 mill. m^3 in 2002. From the same data, one could see that the domestic consumption was around 92% production, what indicates that most of the production is industrially processed locally. So less than 10% of logs went for international trade. Of ITTO's five major log producers, Brazil and Thailand were stable or increasing their production, while India, Indonesia and Malaysia produced less over the period of 1998-2002. Malaysian production fell from about 22 mill. m^3 in 1998 to 19,5 mill. m^3 in 2002, a reduction of almost 11% in five years and of over 55% in the last decade. In other part, Indonesia experienced a significant decline in log production, decreasing from nearly 34 mill. m^3 in 1997 to 25 mill. m^3 in 2002 (according to official figures, as reported in ITTO Annual Review and Assessment…, 2002).

Indonesia, Malaysia, Brazil and India are the dominant producers which together comprise around 70% of total ITTO production of tropical logs. Consumption shows a dual path: Brazil and India were relatively stable, while Indonesia and Malaysia steadily decreased during 2000-2002. China is the fifth largest consumer of tropical logs, with over 7 mill. m^3 in 2001.

China is the largest importer of tropical logs, over 6,9 mill. m^3 in 2001. China's growing economy, the ban of domestic harvesting and zero tariffs on log imports continue to be the main driving factors behind hunger for imports. China's total log imports from all sources exceeded those of Japan for the first time in 2001. EU countries imported just over 2 mill. m^3 of tropical logs, mostly from Africa.

Total ITTO producer member exports were almost 15,9 mill. m^3 in 2001, but it fell to just 12,8 mill. m^3 in 2002. Malaysia continues to dominate the trade in tropical logs. Malaysia's major log buyers are China, Taiwan, Japan, and India, accounting for 81% of the reported log export from Malaysia. Indonesia was the second largest exporter in 2001, at almost 3,5 mill. m^3 reported (ITTO, 2002).

2.2 Primary processed wood products

2.2.1 Sawnwood

Primary processed wood products reported in this chapter are sawnwood, veneer, plywood particleboard, fiberboard, and wood pulp. World imports of these products as shown in Figure 2.1 and in Figure 2.2 tend to increase slowly since 1992. Sawnwood can be seen as the biggest product in volume terms, but also the most fluctuating one.

The world import of sawn wood (all species) exhibits a small increase of 25.8% in 11 years. The total import of this product was 93 mill. m^3 in 1992, and followed by steadily increases until 1997 when total import was in a peak level of 118 mill. m^3. The sharp decrease was then occurred in 1998 when the volume imported dropped to 102 mill. cum.

In tropical species import data is given for the period of 1998-2002, based on ITTO data. World imports of tropical sawnwood increased steadily from 7,0 mill. m^3 in 1998 to 9,5 mill. m^3 in 2002 (Table 2.1). In 2002, however, it dropped to about 8,9 mill. m^3 ITTO members that belong to consumer group absorbed around 80% of the total imports, while those belonging to producer group imported the rest.

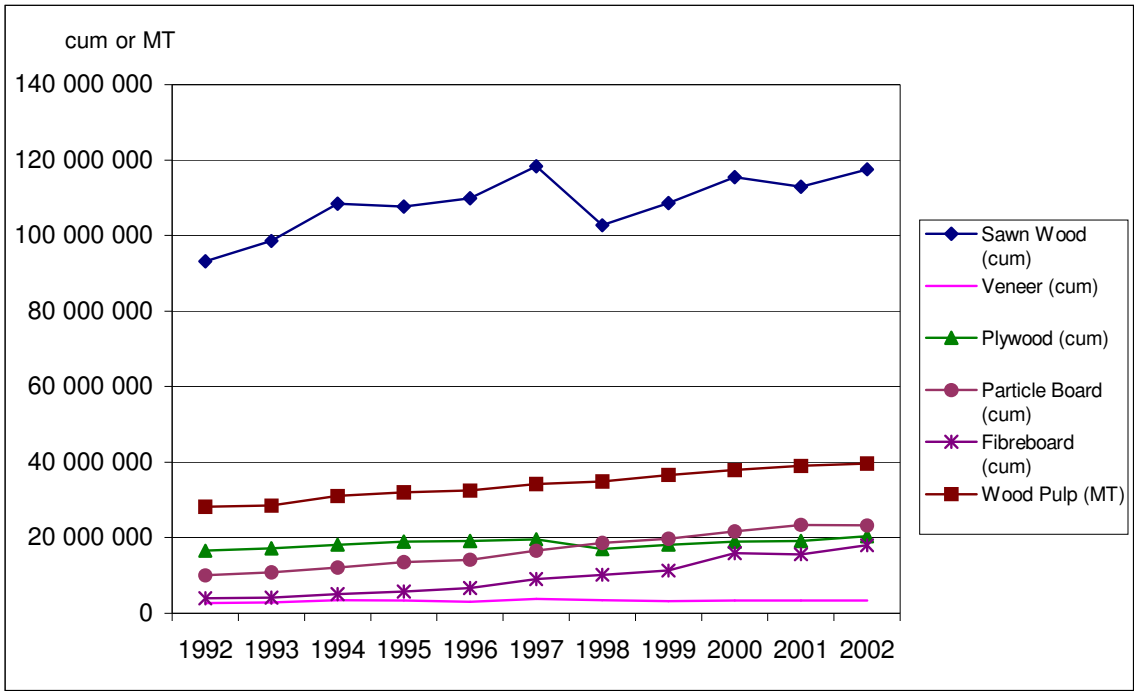
Total value of the imported product in 2000 was around US$ 3,115 mill., of which about US 2,884 mill. was from the consumer group's expenditures. In 2001 the value increased to US$ 3,545 mill., where US$ 3,246 mill. of which was expenditures of the consumer group.

Table 2.1 World imports of tropical sawnwood (1000 m^3)

Country group	1998	1999	2000	2001	2002
Consumer	5210	6461	7744	7759	7272
Producer	1796	1629	1604	1780	1579
World	7006	8090	9348	9539	8851

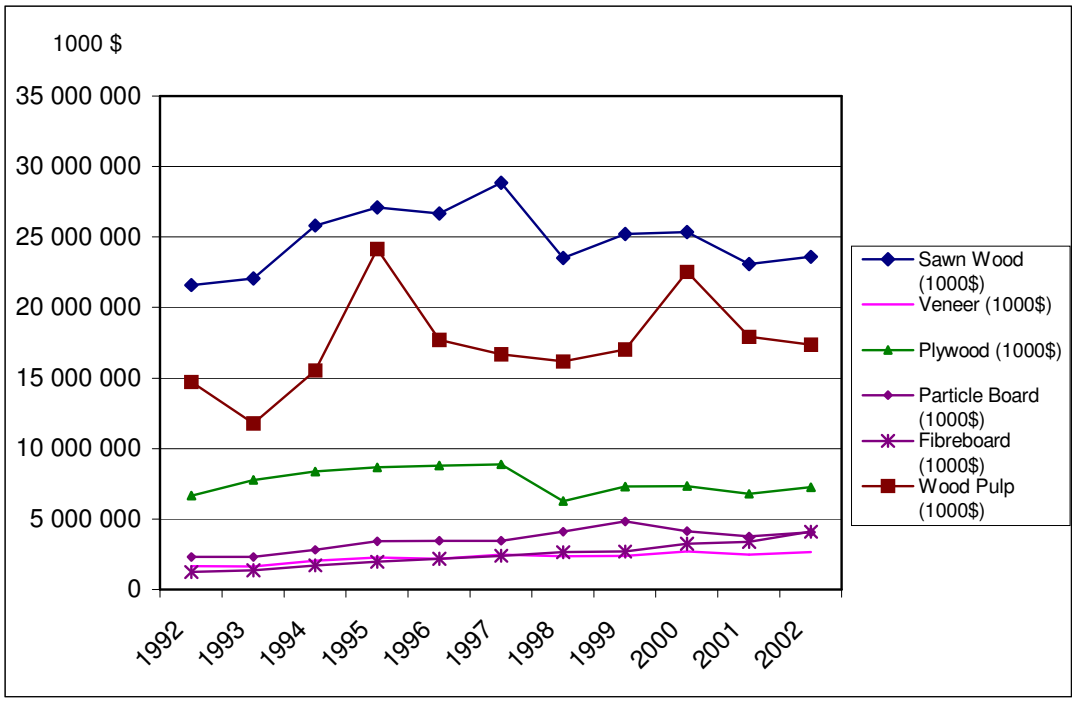
Source: ITTO (2003)

Figure 2.1 World import trends of primary processed wood products (volume)



Source: FAO (2003)

Figure 2.2 World import trends of primary processed wood products (value)



Source: FAO (2003)

Nominal average import prices are compiled in Table 2.2. Only veneer makes an exception in long-term average import price development. It has held firm and shows a growing price trend, unlike all the other primary processed wood products, which have suffered from falling prices (Table 2.2).

Table 2.2 Average world import prices (CIF, nominal) of primary processed products

Product	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Sawnwood	232	224	238	252	243	244	229	232	220	205	201
Veneer	605	561	589	664	723	650	675	771	788	733	788
Plywood	404	452	460	455	459	454	369	400	386	355	356
Particle Board	231	212	230	250	243	209	220	243	191	161	173
Fiberboard	317	322	335	342	321	262	259	236	203	216	228
Wood Pulp*	524	413	501	756	546	487	464	465	594	460	438

USD/m^3 or USD/ton*

Source: FAO (2003)

2.2.2 Veneer

World import of veneer (all species) remained fairly stable at a range between 2,8 and 3,8 mill. m^3 in 1992-2002 (Figure 2.1). However, slight fluctuations occurred during that period. Import value showed increasing trend from about US$ 1,7 mill. in 1992 to US$ 2,6 mill. in 2002.

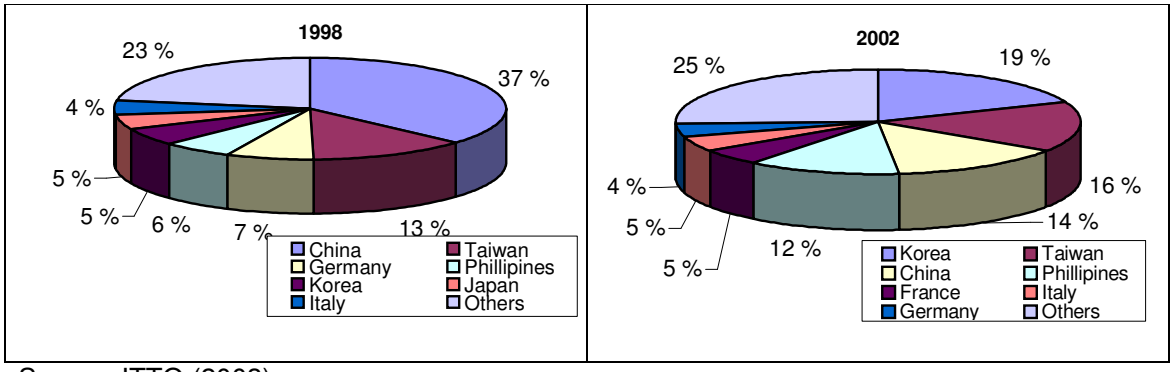
Imports of tropical veneer increased from about 1,1 mill. m^3 in 1998 to 1,4 mill. m^3 in 1999 and 2000 (Table 2.3). Afterwards it dropped to about the same level as in 1998. In 2002, about 82% of the total volume were imported by ITTO consumer countries, while the rest was imported by producer countries.

Table 2.3 World Import of Tropical Veneer (1000 m^3)

Country group	1998	1999	2000	2001	2002
Consumer	966	1193	1258	1053	886
Producer	114	230	142	138	193
Total	1080	1423	1400	1191	1079

Source: ITTO (2003)

Figure 2.3 Major importers of tropical veneer (volume)



Source: ITTO (2003)

2.2.3 Plywood

The world imports of plywood (all species) increased steadily from 1992 to 2002, although a small decrease occurred in 1998 and 2001 (Figure 2.1). Starting from 1992 when the total volume imported was 16,5 mill. m^3, it increased every year until 1997 when the total import reached 19,5 mill. m^3. The volume then fluctuated from about 18,7 mill. m^3 in 1998 to finally reached about 20,4 mill. m^3 in 2002.

The above trend was followed by similar trend of the product's value. The total value of the product steadily increased from about US$ 6,7 mill. in 1992 to about US$ 8,9 mill. in 1987 in line with the increased of the volume imported. The fluctuation occurred in the following years from about 6,3 mill. in 1998 to about US$ 7,3 mill. in 2004.

As it was in the case of sawnwood, a different trend occurred between all plywood of species and those of tropical species. While import of plywood all species fluctuated during period 1992-2002 with increasing trend, import of tropical species plywood showed a decreasing volume year by year at the same period. In 1998 the total volume imported was about 10,7 mill. m^3 and it steadily decreased until 9,7 mill. m^3 in 2002. Consumer group imported most of the imported plywood (99%).

The value of the imported tropical plywood started from 10,7 mill. m^3 valued at about US$ 12,3 mill. in 1998. It decreased to 10,5 mill. m^3 in 1999, about 10,4 mill. m^3 in 2000 and 10,3 mill. m^3 in 2001, and the value lowered to US$ 10.5 mill., US$ 12.3 mill., and US$ 12.3 mill.

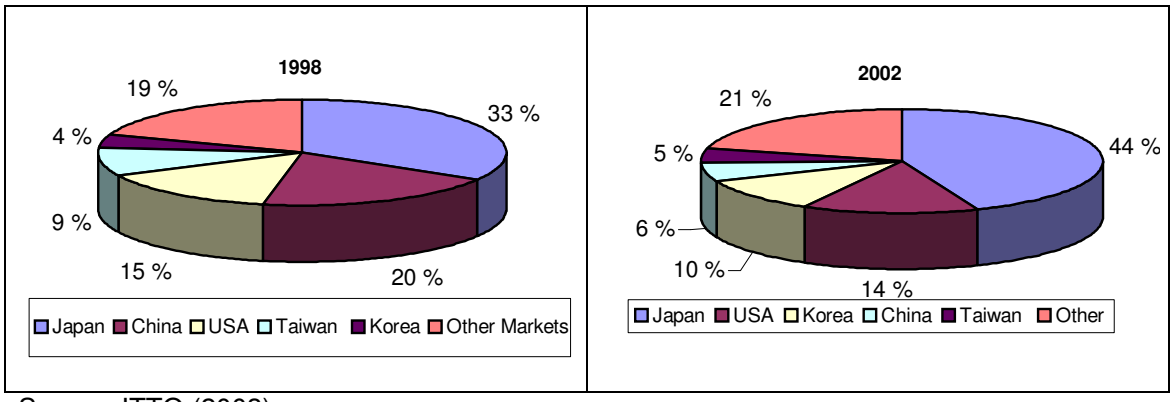
respectively. The trend on world import of tropical plywood can be seen in the following table and figure.

Table 2.4 World Import of Tropical Plywood (1000 m^3)

Country group	1998	1999	2000	2001	2002
Consumer	10596	10415	10303	10234	9712
Producer	81	107	85	99	110
Total	10677	10523	10388	10333	9822

Source: ITTO (2003)

Figure 2.4 Major importers of tropical plywood (volume)



Source: ITTO (2003)

Big markets of tropical plywood during 1998-2002 were the following five countries: Japan, China, USA, Taiwan and Korea. Japan was the biggest importer absorbed 33% of the total export in 1998 and its dominance increased to 43% in 2002. Japan was followed by China and USA in the second and the third places. China has reduced its imports gradually from 2,084 mill. cum in 1998 to only 570,000 cum. in 2002.

Taiwan's imports reached 919,000 cum that put it into the fourth position in 1998. However, in the following years the market reduced to around 600,000 cum in 1999 and 2000, and again it reduced to around 460,000 cum by 2002. In contrast, Korea increased its export steadily from 456,000 cum in 1998 to 1,022 mill. cum in 2002 when it finally was in the third position.

2.2.4 Particleboard

Starting from about 10,1 mill. m^3 in 1992, the total volume of particleboard imported increased steadily to 22,8 mill. m^3 in 2001, before slightly dropping to 23,9 mill. m^3 in 2002

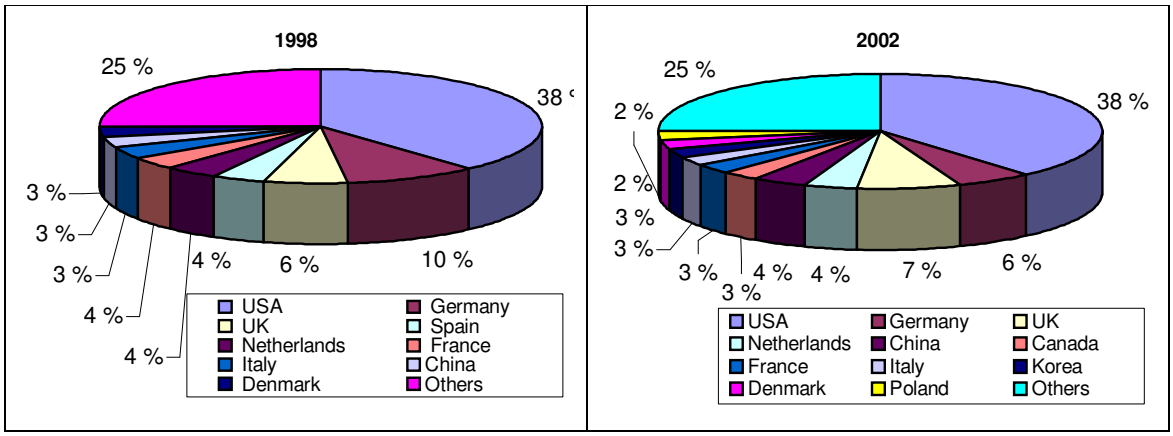
Figure 2.1). Among ITTO members, particleboard imports during 1997-2001 increased from year to year, with average increase around 9% per year. Started from about 16,56 mill. m^3 in 1997, it reached about 23,3 mill. m^3 in 2001, nearly equaling to world total (Table 2.5).

Table 2.5 World imports (ITTO members') of particleboard (1000 m^3)

Country group	1997	1998	1999	2000	2001
Consumer	16276	18474	19611	21392	23065
Producer	280	213	199	327	277
Total	16556	18687	19810	21720	23342

Source: ITTO (2003)

Figure 2.5 Major importers of particleboard



The United States was the biggest market for particleboard. Germany and United Kingdom followed next. Together with other leading markets in France, Netherlands, Republic of Korea, Japan, Italy, China, Denmark, Canada, Spain, Slovakia, and Poland, these absorbed around 75% of the world imports of particleboard.

Imports of this product by USA increased steadily from 7,18 mill. cum in 1998 to 9,67 mill. in 2001. Imports by Germany decreased gradually from 1,79 mill. cum in 1998 to 1,32 mill. cum in 2002, while those in the United Kingdom fluctuated between 1,15 mill. cum in 1998 and 1,74 mill. cum in 2002.

Particleboard is a bulky product that cannot usually be profitably transported long distances to overseas markets. Most big consumer countries have an ample domestic production, and particleboard accounts for most of the wood-based panels output. Only some value-added types of particleboards can be more feasible for foreign trade.

2.2.5 Fiberboard

World import of fiberboard increased steadily from 1992 when the total volume imported was about 3,97 mill. m^3 to about 15,95 mill. m^3 in 2000. A slight decrease (-2.3%) then occurred from in 2001, but it went up in 2002 when the volume exported was around 17,96 mill. m^3. The average increase during 1992-2002 was about 17% per year (Figure 2.1).

ITTO members imported in 1997 9.13 mill. m^3, and this increased gradually to 15,95 mill. m^3 by 2000 (Table 2.6). A slight decrease, however, occurred in 2001, where the volume was 15,59 mill. m^3.

Table 2.6 World imports (ITTO members') of fiberboard (1000 m^3)

Country group	1997	1998	1999	2000	2001
Consumer	8814	9854	11044	15564	15226
Producer	313	310	317	385	359
Total	9126	10164	11361	15949	15585

Source: ITTO (2003)

Fiberboard trade was concentrated in the USA, the United Kingdom, Germany, the Netherlands, China, Italy, Japan, and Spain. They altogether purchased around 75% of the world import of this product. USA and the UK imported 4,329 mill. cum and 1,042 mill. cum respectively. In 2002 Germany imported 1,184 mill. cum. Imports by China have increased steadily to 2,780 mill. cum in 2000. However, it dropped to 1,262 mill. cum by 2002.

2.2.6 Wood pulp

World imports of wood pulp increased gradually with average increase of 3.5% per year, from about 28,20 mill. tons in 1992 to around 39,66 mill. tons in 2002 (Figure 2.1). Due to the large scales of investments needed to integrate pulp mills into domestic paper production, a 25% large share of output is market pulp, i.e. destined for the international markets in sheets

of pulp to furnish the foreign paper mills. Chemical wood pulp mainly ends up in printing and publishing papers, which in supply paper raw material to printers and publishers of advertising, color-printed magazines and commercial catalogues, etc.

2.3 Further processed wood products

2.3.1 Overview

"Value-added", "secondary-processed" and "further-processed" are terms used synonymously throughout this report. They refer to the secondary and tertiary processing stages of wood industry. Products covered in this report are profiled wood (mostly mouldings), builder's joinery and carpentry (BJC), wooden furniture and parts, and other wood manufactures such as wood carvings.

Multiple benefits from value-added processing of wood have attracted policy makers and developers of forest industry in most emerging exporter countries. This is from one part explained by the dwindling supplies of natural tropical timber in many producer countries, but on the other hand it reflects industry restructuring to capture higher value added and revenue from international trade. Globalization has opened up new trading opportunities, improved technology has been transferred to producer countries, and competition has stiffened in terms of substitution between suppliers and species in the primary processing. As a result, the prices of commodity wood products have slid downhill.

As a result of these forces, the exports of primary processed wood products from tropical forest declined in the 1990s, while exports of further processed products mushroomed at the same time. International trade of value-added wood products, especially furniture has liberalized, thereby increasing the import component of consumption, thus creating more export opportunities for developing countries. International trade in the three groups of major SPWPs (secondary-processed wood products, including furniture parts of all materials) reached a total value of $46,0 bill. in 2002, up by 27.8% from 1998 level ($36,0 bill.). Wooden furniture was the main product group, with $36,5 bill. import value. Furniture parts accounted for $5,05 bill. of that total, leaving $ 31,46 to various types of furniture. In all major world markets, furniture imports from developing countries have grown faster than overall imports, and influx of products from China is the single most important reason behind this development. In builders' joinery and carpentry (BJC), developing countries have not

been able to capture higher market shares due to higher technological entry barriers. BJC accounted for $6,09 bill. and profiled wood $2,85 bill. of the total in 2002.

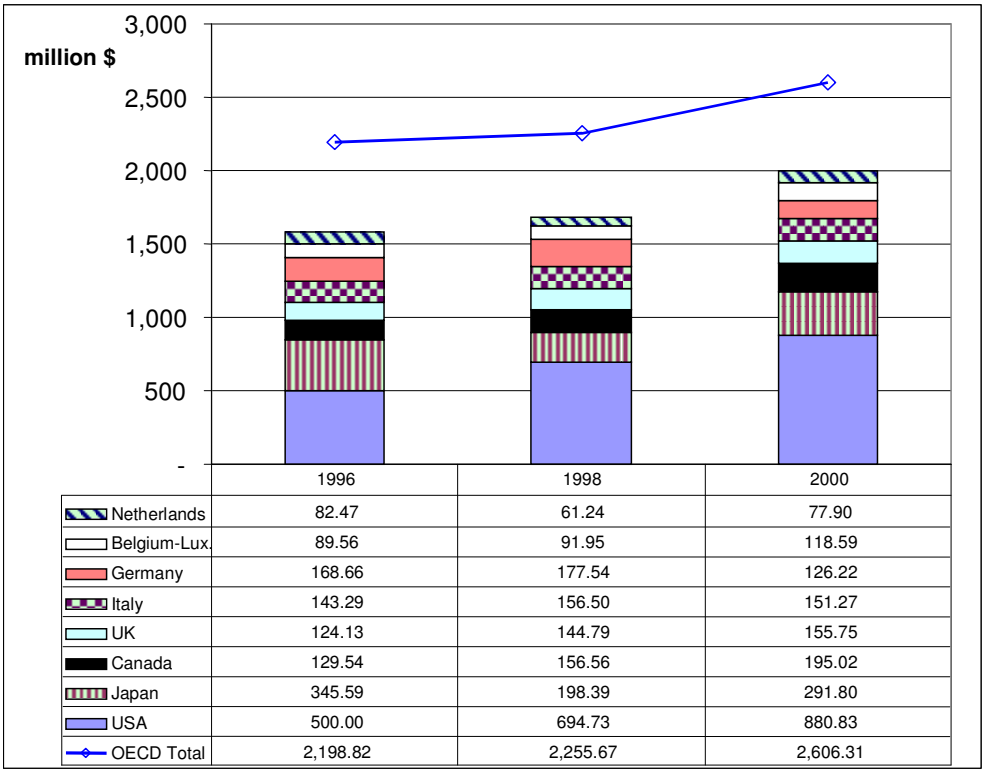
2.3.2 Profiled wood

World imports of profiled wood was nearing $ 3.1 bill. in 2002 Figure 2.8). The trade grew 21.5% between 1998 and 2002, mainly thanks to increases in the USA and Japan. The two countries took 41% of all imports in 2001 (Figure 2.7), while the top-8 group presented in Figure 2.6 accounted for 77% of the total imports in 2000. After the temporary declines recorded in both profiled hardwoods and softwoods in 2001, imports were overturned into 10% increase in 2002. In 2002, USA absorbed 32% of the world imports, followed by Japan (8%), the UK (6%), Germany (4%) and France with 3%. The top five countries accounted for 53% of the world imports. In Germany, European deliveries of profiled wood expanded sharply, while Asia lost importance. Presumably, this was due to rising deliveries from the Eastern Europe.

Profiled hardwoods grew by 25% in trade value over the period 1998-2002, while softwoods recorded a 17% total growth. Trade share of profiled hardwood has slightly declined as producer countries have gradually moved onto downstream processing in their exports. Profiled wood and BJC are both structural (functional) products, which follow similar demand dynamics driven largely by new construction and renovation activity.

In profiled wood, Latin American suppliers (Chile, Brazil) have reached a dominating position in the United States market, while Asian and central and eastern European suppliers have been gaining ground in Japan and in Germany, respectively.

Figure 2.6 Imports of profiled wood by major countries



	1996	1998	2000
Netherlands	82.47	61.24	77.90
Belgium-Lux.	89.56	91.95	118.59
Germany	168.66	177.54	126.22
Italy	143.29	156.50	151.27
UK	124.13	144.79	155.75
Canada	129.54	156.56	195.02
Japan	345.59	198.39	291.80
USA	500.00	694.73	880.83
OECD Total	2,198.82	2,255.67	2,606.31

Source: COMTRADE 2002

2.3.3 Builders' joinery and carpentry

World imports have grown from $ 5,5 bill. in 1998 to $ 6,1 bill. in 2000, declined to 6,0 bill. in 2001 and resumed a new growth to $ 6,4 bill. in 2002 (Figure 2.7 and Figure 2.8). Trade expanded by $718 million between 2001-2002, which is the highest growth for one year in the recent past. The top-8 countries accounted for 75% of the imports, with USA alone absorbing 29% in 2001. Inside the BJC category, wooden doors, frames and tresholds have remained on a steady growth trend throughout 1998-2002, reaching $1,79 bill. import value worldwide. Unspecified "other" BJC, which comprises e.g. assembled parquet panels, shuttering and miscellaneous products, measured however two times more in trade value ($3,56 billion) in 2002. That year also marked a recovery for trade in wooden windows and frames. This category had been on a steady decline between 1998-2001, but went on a new gear in 2002, reaching the level of $ 764 mill./yr.

Among the major importers (see Figure 2.10), the USA, the United Kingdom, France and Italy have shown a clear growth trend, while imports into Germany, Japan, Austria and

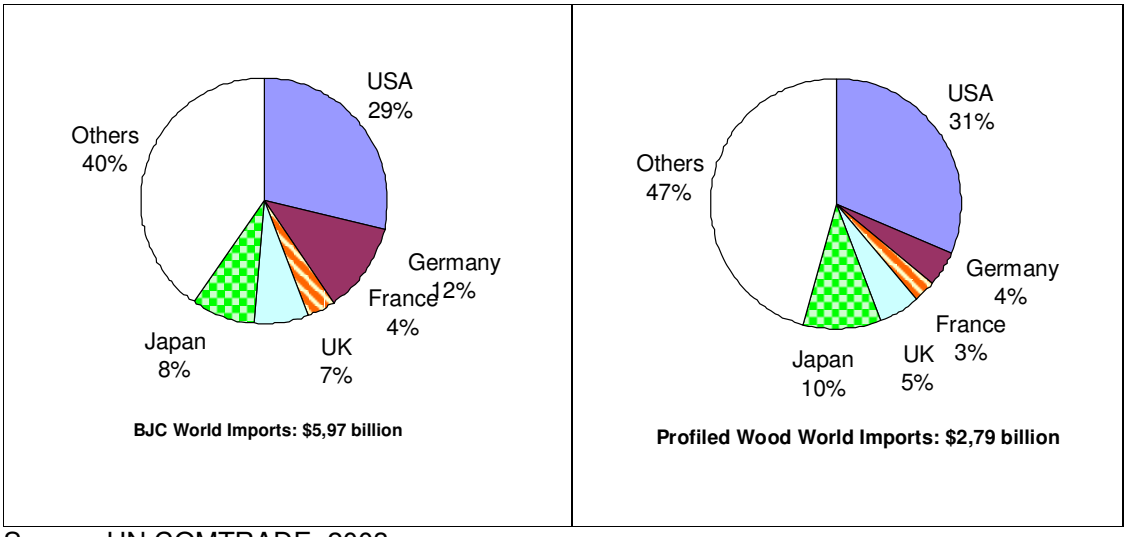
Switzerland have all declined. Poor performance of (mainly residential) construction sectors in these countries, coupled with stringent product standards and harsh domestic competition (see list below) are the main reasons for the decline in imports.

Opposite to the developments in furniture, the developing market economies have lost their shares of overall imports in BJC. There are several reasons for this:

- BJC segment is strictly regulated by country-specific standards stipulating the physical, chemical (glues and finishes) and dimensional properties.
- Manufacturers in the developed countries have made technical innovations through continuous product development, which developing countries cannot compete with.
- Increasingly, the windows, doors and floorings are sold as a building system (total solutions such as factory-glazed window units), which remain out of reach for developing countries.
- New material combinations have been developed e.g. for windows, substituting hardwood and mixing it with e.g. aluminium and PVC.

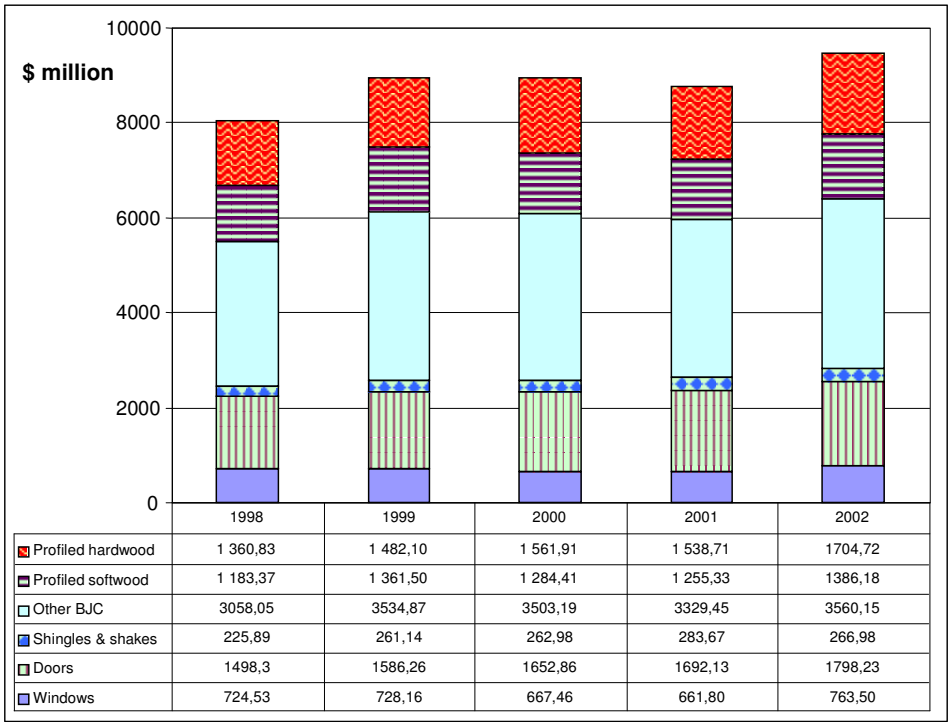
In conclusion, this means that the entry barriers have become even more difficult for developing countries to overcome.

Figure 2.7 Major Importers of BJC and Profiled Wood in 2001



Source: UN COMTRADE, 2003

Figure 2.8 Imports of BJC by major countries



	1998	1999	2000	2001	2002
Profiled hardwood	1 360,83	1 482,10	1 561,91	1 538,71	1704,72
Profiled softwood	1 183,37	1 361,50	1 284,41	1 255,33	1386,18
Other BJC	3058,05	3534,87	3503,19	3329,45	3560,15
Shingles & shakes	225,89	261,14	262,98	283,67	266,98
Doors	1498,3	1586,26	1652,86	1692,13	1798,23
Windows	724,53	728,16	667,46	661,80	763,50

Source: COMTRADE 2002

2.3.4 Wooden furniture

World imports of wooden furniture and parts amounted to $33,0 bill. in 2000, compared to $27,9 bill. in 1998 (Figure 2.9). Trade value resumed fast growth in 2002, with an expansion of $3,3 bill., or 10% up from the 2001 level to $36,5 billion. The absolute growth of import value was 30.7% over the four-year period 1998-2002. “Other” furniture (miscellaneous, but known to comprise e.g. living/dining room items, shop-fitting and small occasional furniture) constitute the largest product categories in trade (36%). Wooden seats made up 22% of all trade, and kept growing at an 11% rate. Wooden bedroom furniture grew with the fastest pace (15% between 2001-2002). The only product category that declined in 2002 imports was wooden office furniture (down 4%), due to a difficult business environment in major importers in Europe, Japan and the US. Little movement in the structure of trade between categories has taken place since 1998. However, the trade is growing, e.g. furniture parts exceeded $5,0 bill. for the first time in 2002.

The growth has mainly been a result of strong imports into the major markets like USA and the United Kingdom (Figure 2.10), but also some minor importers like Canada, Australia,

Spain, Ireland and Mexico (Figure 2.11) have doubled or tripled their imports. It is worth notifying that developing countries have won market shares over their competitors in developed countries. In all major markets, imports from the developing market economies have grown faster than overall imports. In addition to China, numerous other countries have captured more trade opportunities in furniture. This heralds the nature of furniture-making as a low-entry barrier industry, where much of the output can be still produced with labor-intensive methods without high-tech or high initial investments.

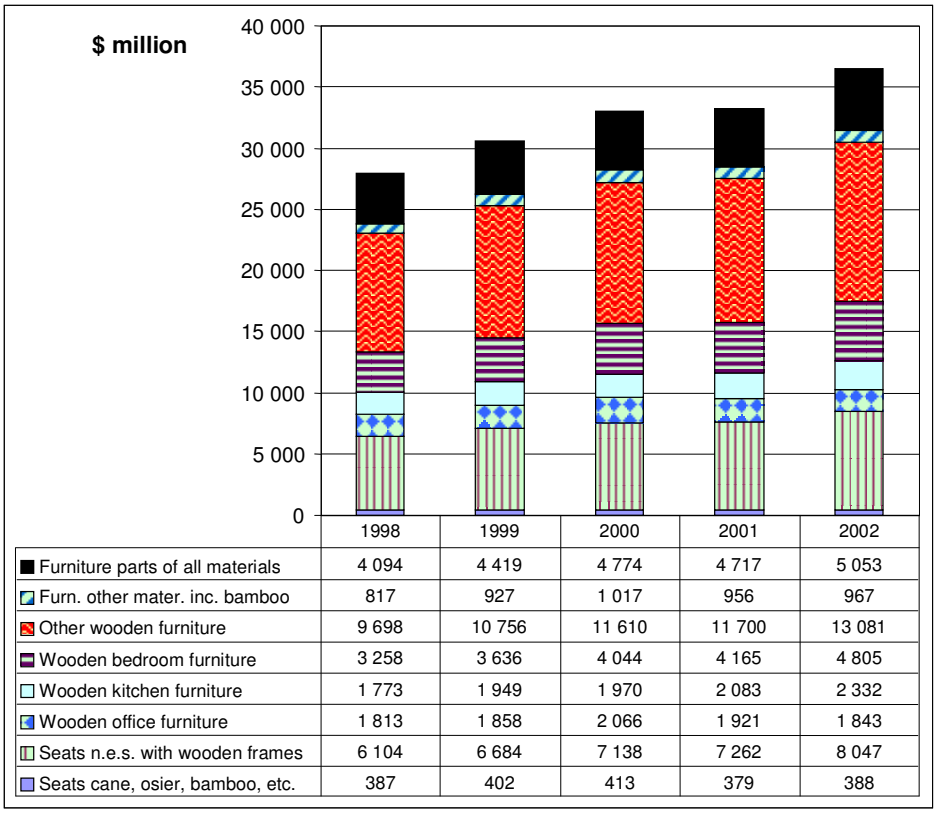
Top-five countries imported 62% of all wooden furniture in 2002. US increased its lead by purchasing a massive $12,6 bill. worth of wooden furniture (34% of world total). It was followed by Germany (9%), the UK (8%), France (6%) and Japan (5%). Other countries accounted for the remaining 38% of global imports. Imports have declined in some key markets like Germany, Japan and Belgium-Luxembourg. Recession in Germany's construction sector has been a precursor for decreasing furniture consumption and imports. The new residential housing has fallen in a cyclical pattern since the peak of 1997. Japan's economy has ground to a halt and stagnated throughout the last decade and so have the furniture imports. Dwelling construction has followed a mostly downward trend since 1990, and it is expected to continue falling during this decade. Aging consumers and increasing number of single and two-person households are additional driving forces to be reckoned with.

Looking down the road into 2003, it has been clearly signaled by the Chinese market reports that an unprecedented furniture export growth has materialized in 2003 and in the first quarter of 2004 (China's Forest Products Market Information, May, 2004). The solid reasons are the mushrooming scale of the Chinese industry, and the frequently reported improvements in furniture quality. The more flexible US companies have already taken full advantage of contract manufacturing to the extent that 60% of China's wooden furniture is made according the American style and designs. But there are also some short-term trade measures that can be observed behind China's unusually high trade expansion to the US. The primary reason is that the US importers were buying briskly in anticipation of anti-dumping duties against the Chinese imports in the wooden bedroom furniture business, the mainstay of China's surging deliveries to the US. In November 2003, 28 American furniture manufacturers resorted to an extreme measure, requesting an anti-dumping investigation. On June 18th, 2004 the US

announced anti-dumping duties with a maximum of 198% for Chinese bedroom furniture (Financial Times, 19 June, 2004)

China's exports to the European countries have remained flat thus far, but the coming impediments for trade with the US may give a stronger impetus for turning into the European market.

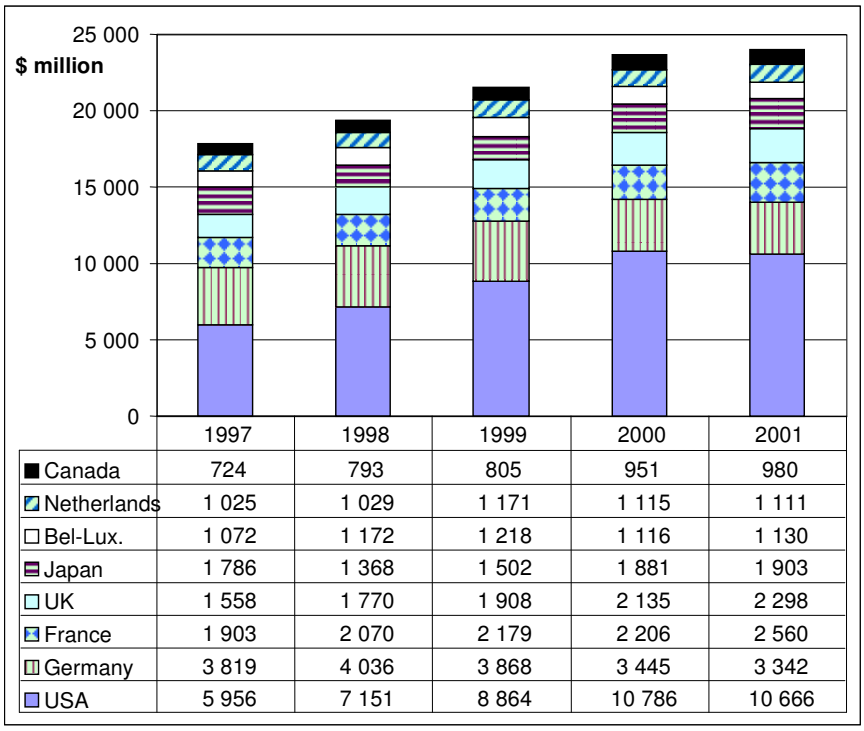
Figure 2.9 World imports of wooden furniture by type



	1998	1999	2000	2001	2002
Furniture parts of all materials	4 094	4 419	4 774	4 717	5 053
Furn. other mater. inc. bamboo	817	927	1 017	956	967
Other wooden furniture	9 698	10 756	11 610	11 700	13 081
Wooden bedroom furniture	3 258	3 636	4 044	4 165	4 805
Wooden kitchen furniture	1 773	1 949	1 970	2 083	2 332
Wooden office furniture	1 813	1 858	2 066	1 921	1 843
Seats n.e.s. with wooden frames	6 104	6 684	7 138	7 262	8 047
Seats cane, osier, bamboo, etc.	387	402	413	379	388

Source: COMTRADE 2001

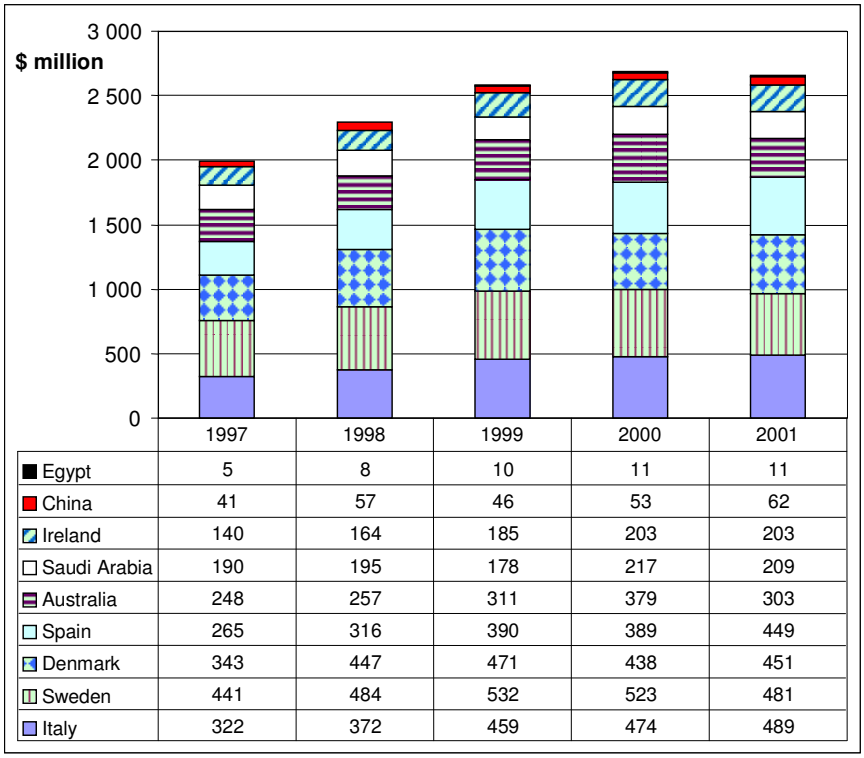
Figure 2.10 Imports of wooden furniture by the biggest markets



	1997	1998	1999	2000	2001
Canada	724	793	805	951	980
Netherlands	1 025	1 029	1 171	1 115	1 111
Bel-Lux.	1 072	1 172	1 218	1 116	1 130
Japan	1 786	1 368	1 502	1 881	1 903
UK	1 558	1 770	1 908	2 135	2 298
France	1 903	2 070	2 179	2 206	2 560
Germany	3 819	4 036	3 868	3 445	3 342
USA	5 956	7 151	8 864	10 786	10 666

Source: COMTRADE 2003

Figure 2.11 Imports of wooden furniture by other major markets



	1997	1998	1999	2000	2001
Egypt	5	8	10	11	11
China	41	57	46	53	62
Ireland	140	164	185	203	203
Saudi Arabia	190	195	178	217	209
Australia	248	257	311	379	303
Spain	265	316	390	389	449
Denmark	343	447	471	438	451
Sweden	441	484	532	523	481
Italy	322	372	459	474	489

Source: COMTRADE 2003

2.3.5 Other further processed wood products

This category covers a mixed range of wood-based products. To start with, the OECD imports of **wooden packaging** (packings, cases, boxes, crates, wooden pallets, box pallets, etc.) were in the range of USD 1,28 bill. in 2000, and majority of imports was traded between the industrialized countries. EU's internal trade was the major hub for wooden packaging products, taking nearly USD 900 mill. of all trade. Developing market economies and China were left with no more than USD 88 mill. deliveries (see Table 2.7). This category is therefore not very promising for developing country suppliers outside domestic or neighboring markets.

Decorative and domestic articles of wood represent a larger export niche for developing countries than builders' joinery and carpentry, measured at USD 2,263 bill. in OECD imports. Included are frames for paintings, pictures, photographs and mirrors, tableware and kitchenware, caskets and cases, statuettes and ornaments, wood marquetry, etc. This is a product category where original designs and handwork can add value to the wood, and small-sized articles command relatively high price/weight ratio in exports. Most products tend to be artisanally produced and collected from larger areas for collective exports. On the other hand, picture and mirror frames are more typically an OEM (original equipment manufacturing) segment, where high-speed moulders and standardized profiles and designs rule the bulk of the market.

Picture frames are interestingly using lesser-used species and some MDF, particularly when a wide range of finishes are required. As the dimensions are usually small, this application provides opportunities for efficient use of off-cuts and processing waste, or small-diameter trees or tree parts. Painted frames are a potential outlet for lesser-used or plantation species, which could replace higher-value species and support a shift away from scarce species.

"Other" manufactured products are understood to cover tools and tool/brush bodies and handles of wood, as well as shoe lasts to lesser degree, and "other" unspecified articles of wood like clothes hangers, turned wood products like spools, bobbins, toothpicks, blinds, dowel pins, match splints, wood paving blocks, etc. The product category is truly a very miscellaneous one, but nevertheless it appears to represent some significant world trade value for developing countries.

Table 2.7 OECD Imports of other further processed wood products by type

		1996	1997	1998	1999	2000	% share		Index 2000
Product category		USD mill.					1996	2000	(1996= 100)
Packings, cable drums,	a	865,34	943,98	1 099,17	1 186,61	1 276,95	2,9	3,4	148
box pallets, etc.	b	51,65	55,13	60,80	66,12	88,08	0,6	0,6	171
Coopers' products	a	159,22	201,59	262,48	290,27	301,64	0,5	0,8	189
and parts	b	1,91	2,41	2,15	2,69	2,53	0,0	0,0	132
Products for domestic/	a	1 804,00	1 904,77	1 943,47	2 118,49	2 264,23	6,1	6,0	126
Decorative use	b	1 325,38	1 405,97	1 451,49	1 611,05	1 775,65	15,5	12,8	134
Other manufactured	a	2 219,07	2 375,87	2 508,73	2 736,67	2 905,89	7,5	7,7	131
Products	b	809,47	867,11	915,62	1 046,23	1 202,91	9,5	8,6	149

Source: COMTRADE 2002

Notes: a/ Total imports, b/ Imports from developing market economies and China

3 INDONESIA´S ROLE IN INTERNATIONAL FOREST PRODUCTS TRADE

3.1 Primary processed wood products

3.1.1 Global overview of major players

Around 18 countries in the world play a significant role in exports of logs and primary processed wood products (Table 3.1). Canada counted as number one of wood-based export value, followed by USA and Germany. Indonesia rested in 7th position, exporting around $5,0 bill. worth of primary processed wood products in 2001.

3.1.2 Sawn hardwood

In sawn hardwood data extracted from COMTRADE, both tropical and temperate species have been included. The Harmonized System (HS) codes are 4407.21-4407.99. The preliminary review of Indonesian statistics revealed that part of sawnwood exports had been reported as made of "temperate" species. This discrepancy represents perhaps a purpose-built, systematic flaw in the statistical service to facilitate market access, and lower import tariffs in the markets and/or evade export taxes and fees in Indonesia.

The global imports were worth $5,6 bill. in 2002, out of which Indonesia held a 9.3% ($523 mill.) market share (Table 3.2). Trade volume was reported 13,8 mill. tons, and Indonesia captured 10.3% market share ($1,4 billion). Indonesia's role in world trade appeared to increase steadily from 1998 until 2001, but year 2002 produced a dip downwards, particularly in volume of trade.

Unit value comparison between the world trade in sawn hardwood and Indonesia's part of it revealed a price discount to the detriment of Indo products, ranging widely between the years. In 2002 the price gap was at its lowest point with 9.4% discount for Indo products. One year earlier the difference was at its highest with a remarkably wide 33.7% gap.

Indonesia's role as a supplier in world trade of sawn hardwood has been on the rise (Table 3.3). Due to its rising supplies, Indonesia ranked second only after the USA in world's hardwood trade with 9.3% share in 2002. Indonesia has surpassed Malaysia and Canada in the five-year period.

Table 3.1 Global key players in wood-based products exports and imports (2001, USD mill.)

Exporters	Canada	USA	Germany	Finland	Sweden	France	Indonesia	Austria	Russian	Belgium	Brazil	Nether-lands	Malays.	UK	Italy	Others	**Total Imports**
Importers																	
USA	18 989		744	664	163	194	285	103	154	45	735	97	132	148	130	1 454	**24 037**
China	490	1 008	519	139	103	143	1 650	49	1 015	66	204	65	962	55	89	4 987	**11 544**
Germany	357	471		2 111	1 196	1 045	35	945	83	559	107	603	16	264	482	2 342	**10 616**
Japan	1 783	1 752	62	349	45	35	897	135	600	10	130	17	775	10	20	3 245	**9 865**
UK	409	468	939	1 511	1 611	577	111	166	150	357	196	272	59		165	1 859	**8 850**
France	334	213	1 490	756	779		35	280	105	820	134	350	7	218	419	1 007	**6 947**
Italy	393	582	941	394	584	673	57	953	147	127	135	63	18	60		1 736	**6 863**
Netherlands	107	358	740	514	737	368	69	154	78	694	33		109	142	56	95	**4 254**
Canada		3 457	89	61	19	46	22	38	9	7	16	16	9	24	26	100	**3 939**
Belgium	169	189	626	417	242	622	100	83	39		257	341	28	130	60	582	**3 885**
Spain	90	314	304	552	240	304	6	80	4	99	58	76	0	43	202	1 165	**3 537**
Korea Rep.	297	457	53	45	17	31	302	5	154	20	40	7	172	19	25	978	**2 622**
Austria	28	18	784	133	182	72	12		37	48	13	63	1	20	76	660	**2 147**
Mexico	63	1 612	29	32	25	24	26	5	0	18	24	7	11	5	17	216	**2 114**
Denmark	6	24	271	244	611	40	9	14	35	16	2	37	10	36	8	197	**1 560**
Switzerland	52	36	468	143	138	183	2	197	3	22	29	33	1	22	55	123	**1 507**
Poland	7	48	430	183	169	55	4	111	46	13	2	32	0	18	29	241	**1 388**
Australia	66	148	71	137	46	32	107	9	0	8	8	11	30	31	43	599	**1 346**
Sweden	18	65	132	262		43	3	19	14	21	2	23	1	43	8	478	**1 132**
Indonesia	149	212	47	6	62	13		18	13	29	62	59	14	44	5	297	**1 030**
Finland	29	7	66		143	26	4	7	425	7	2	9	0	28	8	137	**898**
Malaysia	24	108	41	49	20	16	170	8	4	5	4	12		17	6	408	**892**
Thailand	42	114	23	13	22	8	45	8	6	5	12	5	101	14	6	380	**804**
Ireland	22	36	41	62	108	24	2	8	43	18	20	18	3	268	5	104	**782**
Others	393	2 367	1 628	1 316	1 881	824	1 041	782	921	224	415	469	623	363	405	6 244	**19 896**
Total Exports	**24 317**	**14 064**	**10 538**	**10 093**	**9 143**	**5 398**	**4 994**	**4 177**	**4 085**	**3 238**	**2 640**	**2 685**	**3 082**	**2 022**	**2 345**	**29 634**	**132 455**

Source: FAO, 2003

Table 3.2 Indonesia's role in world trade in sawn hardwood 1998-2002

OECD sawn hardwood imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	5 188,8	5 792,3	6 420,9	5 888,7	5 613,1
	1000 Tons	9 282,1	10 829,0	13 128,4	13 591,1	13 844,3
Indonesia	Mill. $	320,2	465,0	637,6	628,7	523,4
	1000 Tons	742,7	984,6	1 477,7	2 188,5	1 425,5
Indo market share	% (value)	6,2	8,0	9,9	10,7	9,3
	% (volume)	8,0	9,1	11,3	16,1	10,3
Unit value						
World	$/ton CIF*	559	535	489	433	405
Indonesia	$/ton CIF	431	472	431	287	367
Difference	%	-22,9	-11,7	-11,8	-33,7	-9,4

Source: COMTRADE 2003

Note: Volumes exclude USA & Japan, which do not report it in COMTRADE

* CIF = cost, insurance, freight

Table 3.3 Market shares of leading suppliers in world trade in sawn hardwood 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
USA	23.7	22.4	21.2	20.1	20.7
INDONESIA	6.2	8.0	9.9	10.7	9.3
MALAYSIA	11.9	12.3	12.6	9.8	8.6
CANADA	8.1	7.9	7.6	7.5	7.6
BRAZIL	5.2	4.9	5.2	6.6	6.0
CAMEROON	3.6	3.5	4.6	5.1	4.1
GERMANY	3.5	4.3	3.8	3.6	3.6
COTE D'IVOIRE	4.4	3.3	2.7	3.0	2.7
THAILAND	0.5	0.8	1.2	1.5	2.6
CHINA	2.8	3.1	2.9	2.7	2.6

Source: COMTRADE 2003

Based on ITTO and FAO data, China is the largest importer of tropical timber and non-coniferous sawnwood and a major importer of plywood. India and Korea are also large importers of certain wood products. Japan is the world's largest importer of plywood and a major importer of both tropical timber and non-coniferous sawnwood. The United States, France, Belgium, Spain, Italy, Germany and the United Kingdom are the big consumers of

wood products. To summarize, the global imports by the selected countries by primary products are set out below.

Table 3.4 Primary wood product imports by principal countries/regions

Country/Region	Industrial Roundwood	Tropical Roundwood	Sawn hardwood	Plywood	Pulp
European Union	58,814	3,549	9,293	5,087	15,528
United States	1,511	2,0	1,682	2,435	6,612
Japan	15,948	3,141	1,145	5,033	3,088
China	15,532	7,962	4,533	2,786	4,031
World Total	116,822	20,443	25,332	19,775	37,737
% of EU	48,6	17,4	36,7	25,7	41,1

Source : FAO, 2002

ITTO countries produced in total 38,7 mill. m^3 of tropical sawnwood. Latin America produces around 43% of ITTO sawnwood production. Brazil (15,3 mill. m^3), Malaysia (4,7 mill. m^3), India (6,8 mill. m^3) and Indonesia (6,4 mill. m^3) were the major producers of tropical sawnwood. Production of Indonesia, India and Brazil was stable while Malaysia increased by 6% (to 5,0 mill. m^3) in 2002.

Consumption of tropical sawnwood by ITTO consumer countries declined from 9,0 mill. m^3 in 2000 to 8,4 mill. m^3 in 2002. Brazil, Indonesia, India, Malaysia, and China accounted for 76% of ITTO member's consumption of tropical sawnwood. China´s consumption of tropical sawnwood has doubled in the last five years, overtaking Japan and Thailand. China has become the fourth largest ITTO consumers of the tropical sawnwood. China is the top tropical sawnwood importer, with nearly 3 mill. m^3.

Japan imported substantial quantity of Indonesian sawnwood (43%) in 2001. ITTO producers export almost 8 mill. m^3 of tropical sawnwood. Malaysia continues to dominate the trade with 2,4 mill. m^3 exported (29% of the total ITTO countries). Indonesian exports of sawnwood rose sharply by 61% to nearly 2,3 mill. m^3 in 2001.

3.1.3 Hardwood plywood

In plywood trade data presented in Table 3.5, only hardwood-faced plywood (with at least one outer ply of non-coniferous species) is covered, and as reported by COMTRADE. Veneered

panels and "similar laminated wood" are excluded from this statistical extraction. This means that e,g. blockboard trade is not reflected in the COMTRADE numbers that follow. ITTO data presented later on amends this fault by expanding the coverage also to blockboard, which undeniably has importance for Indonesia's panel industry.

World imports of hardwood plywood have remained fairly steady at around $4 bill. per year in 1999-2002. In tons, trade has increased every year, starting from 4,9 mill. tons in 1998 and reaching 6,6 mill. tons in 2002. Indonesia has not been able to fully maintain its positions, even though it remained the number one supplier throughout the period with a comfortable margin to other suppliers. Indonesia held 37.4% ($1,5 billion) of the world trade value, and 30% (nearly two mill. tons) of the trade volume in hardwood plywood. Indo market shares of world trade have, however, declined notably. Indonesia lost 7,4%-units in value terms and 16%-units in volumes terms of its world market shares in 1998-2002.

Unit value development has been mixed in world hardwood plywood trade from Indonesia's point of view. There is a steadily declining nominal price trend in world trade since 1999, and Indonesian prices have remained clearly higher than world average prices since that year. The price "premium" for Indo plywood has varied between 13%-25% per year and reached its widest spread in 2002. Reasons for this can be found in the pricing behavior of such emerging plywood exporters as China, Malaysia, Russia and Brazil, who have all been able to expand their markets shares at the expense of Indonesia (Table 3.6).

Table 3.5 Indonesia's role in world trade in hardwood plywood 1998-2002

OECD hardwood plywood imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	3 419,2	4 193,3	4 165,9	3 929,1	4 072,2
	1000 Tons	4 869,7	5 226,7	5 836,6	6 233,5	6 614,6
Indonesia	Mill. $	1 533,2	1 924,3	1 816,1	1 560,7	1 522,6
	1000 Tons	2 238,1	2 130,5	2 111,9	2 185,5	1 981,1
Indo market share	% (value)	44.8	45.9	43.6	39.7	37.4
	% (volume)	46.0	40.8	36.2	35.1	30.0
Unit value						
World	$/ton CIF	702	802	714	630	616
Indonesia	$/ton CIF	685	903	860	714	769
Difference	%	-2.4	12.6	20.5	13.3	24.8

Source: COMTRADE 2003
Note: Volumes exclude USA, Japan and the Netherlands because their volume unit differs from others

Table 3.6 Market shares of leading suppliers in world trade in hardwood plywood 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
INDONESIA	44.8	45.9	43.6	39.7	37.4
MALAYSIA	17.1	20.4	20.8	20.4	21.3
FINLAND	9.9	6.9	6.6	7.5	6.7
RUSSIA	4.6	4.2	4.5	5.0	5.8
CHINA	0.7	1.4	1.7	2.6	5.3
BRAZIL	2.6	2.9	3.8	4.2	4.7
CANADA	3.7	3.6	3.9	3.9	4.0

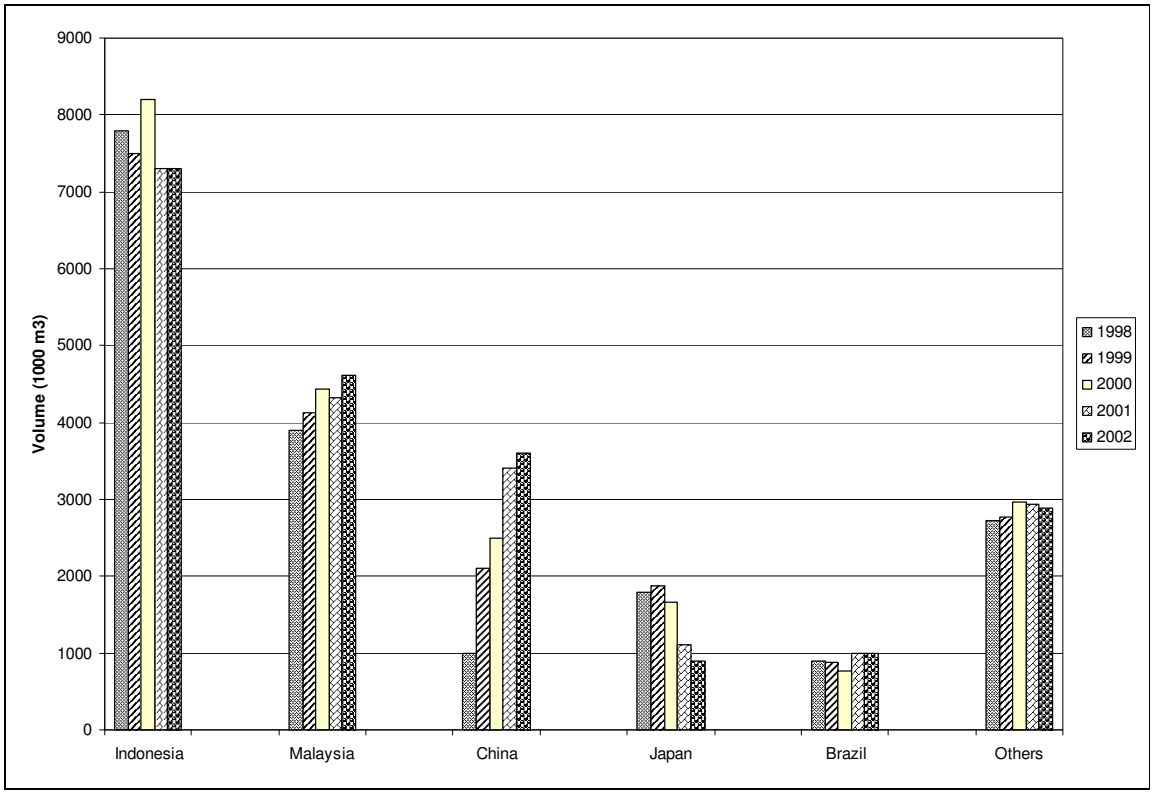
Source: COMTRADE 2003

According to ITTO data (Figure 3.1), the producer countries made 14 mill. m^3 of tropical plywood in 2001. Indonesia remained the top plywood producer, albeit with a drop of 11% in output 2000-2001 (to 7,3 mill. m^3), and remaining stable in 2002. Indonesia's plywood production was expected to fall again in 2003 as the government has announced further logging restrictions. Malaysia's plywood production declined in 2001 by 3% to 4,3 mill. m^3. Plywood production has declined significantly in the last five years in both countries. The Asian region produced 12,5 mill. m^3 of plywood or about 89% of total ITTO member production.

Malaysia is not Indonesia's sole competitor in the tropical plywood business. China is the third largest producer of tropical plywood (3,4 mill. m^3) and raised output to 3,6 mill. m^3 in

2002. (Note: China is recorded among "consumer" countries in ITTO statistics.) China has nearly quadrupled its tropical plywood production in the last five years, and much of this is based on imported tropical and temperate hardwood logs. Production of Japan and Brazil is also significant. Japanese plywood manufacturers are increasing the proportion of softwood in their plywood production.

Figure 3.1 Major producers of tropical hardwood plywood



Source: ITTO, 2003

Some comments on competition in the world markets:

- The international markets have long remained oversupplied at the moment, and the plywood prices went below production costs of many producers (e.g. USD 200-250/m^3 in mid-2003 for Indo 2,7 mm plywood). Gradual price improvement seems to be in the making in Q1/Q2 of 2004, but this is due to tightening supply in Indonesia, and not for markets strengthening.

- China is expanding its plywood production based on "cheap" imported logs from Russia, Africa, Asia, etc. Even though it mainly produces for the booming domestic market, it is now world's third-largest producer and third-largest exporter of tropical plywood.
- Brazil is very competitive in the European and the US markets, as its currency has been devaluated and the plywood industry is very efficiently organized in the south of the country, mainly using plantation pine logs for structural plywoods. To a lesser degree tropical wood from the Amazonas is used for decorative panels.
- The European Community is changing its standards on wood-based panels. As of 1 April 2004 it was compulsory for exporters to apply the 'CE Marking' based on European Union (EU) Standard EN 13986. Under the CE Marking system, wood-based panels traded in the EU must satisfy new health and safety requirements. Manufacturers will need to install quality-control systems in their factories for the regular testing of products and use a certified testing laboratory with third-party auditing. Many tropical plywood producers fear of being barred out of the EU markets because they are lacking the necessary certified testing laboratories.

3.1.4 Chemical wood pulp

The products covered under this heading include semi-bleached and bleached chemical wood pulps, produced either with soda or sulphate methods (HS codes 4703.21 and 4703.29). These are better known as kraft-pulps, which are the most commonly traded "market pulp" grades in global markets. The most relevant sub-category for Indonesia is bleached hardwood kraft pulp (BHKP), and more precisely, mixed (tropical) hardwood pulp (MTP). Dissolving pulp grades are excluded, as also semi-chemical, sulphite, mechanical and unbleached pulp grades. Non-wood pulps are outside the scope of this study.

The kraft market pulp has the biggest world trade among the commodity forest products in this study. World imports were in the magnitude of $12 bill. in 2002, even though a notable fall was reported since peak year of 2000, when trade value hit a mark of $16,7 bill. (Table 3.7). In the same time, volumes in trade show a consistent increase, and went up to 28,7 mill. tons in 2001, before a slight downturn occurred in the difficult paper business year of 2002.

There is a well-known price cycle pattern in the global trade in chemical wood pulp, and low-end prices persisted through 1998-1999 and again in 2002-2003. The unit values in Table 3.7

confirm this cyclical trend by showing strengthening prices in 2000-2001, before a fall to the level of $400/ton in 2002. Indonesia received on average 6.6% lower nominal prices for its pulp than the global average in 2002.

Indonesia was the number five supplier of kraft pulp in world trade. It managed to raise its market shares to the range of 7%-8% both in value and volume terms. It passed Finland among the key suppliers, but is still far behind the two biggest suppliers Canada and the USA (Table 3.8).

World trade of chemical wood pulp is not more than about one quarter of its global output. This is due to the fact that majority of the pulp is being consumed at integrated paper mills, where chemical wood pulp is the raw material for printing and writing papers. In countries like Finland, where the domestic paper industry produces value-added products for exports, a limited amount of pulp is sold to the international markets. The major importer of market pulp is the USA, but numerous other countries buy some of their needs from the world markets, either due to lack of domestic forests and pulp industry, or because of special quality properties provided by certain grades of pulp. Much of the new capacity additions are being made through investments in the Southern hemisphere plantation pulp industries, Brazil, Chile and Uruguay in Latin America, Oceania, Indonesia and China in Asia.

Table 3.7 Indonesia's role in world trade in chemical wood pulp 1998-2002

OECD chemical wood pulp imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	11 456,5	12 132,8	16 728,6	13 209,8	12 123,0
	1000 Tons	23 510,5	25 463,0	27 639,0	28 745,2	28 594,8
Indonesia	Mill. $	539,8	457,6	969,8	911,2	866,4
	1000 Tons	1 412,1	1 063,5	1 524,2	2 275,8	2 187,7
Indo market share	% (value)	4.7	3.8	5.8	6.9	7.1
	% (volume)	6.0	4.2	5.5	7.9	7.7
Unit value						
World	$/ton CIF	487	476	605	460	424
Indonesia	$/ton CIF	382	430	636	400	396
Difference	%	-21.6	-9.7	5.1	-12.9	-6.6

Source: COMTRADE 2003

Table 3.8 Market shares of leading suppliers in world trade in chemical wood pulp 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CANADA	33.7	34.9	33.0	31.0	29.3
USA	16.8	14.3	14.3	14.9	15.3
BRAZIL	9.4	10.7	10.9	10.6	10.6
SWEDEN	9.4	8.9	9.1	9.5	9.9
INDONESIA	4.7	3.8	5.8	6.9	7.1
FINLAND	5.4	5.5	4.7	5.9	6.1
CHILE	4.1	4.8	4.4	4.7	4.8
RUSSIA	2.3	3.1	3.8	3.6	3.3
PORTUGAL	4.2	3.8	3.0	2.5	2.8

Source: COMTRADE 2003

3.2 Wooden packaging products

3.2.1.1 Definition

Wooden packaging products have in general lost importance in storing and transporting consumers goods, commodities and appliances, etc., compared with the early beginnings of industrialization. They have been replaced by synthetic and metal packaging in many applications. However, in some packaging uses like food products (mainly fruit, cheese), and in machinery transports, palletized units, glassware, ceramics and similar, wood packaging has remained the preferential choice. The stiffer regulations on the recyclability and recollection of packaging materials by the seller have worked in favor of wood, which has smaller weight – strength ratio than substitute materials. Also wood's natural ability to absorb shocks without breaking apart is a quality assurance demanded by many fragile products.

The two sub-segments of wooden packaging products discussed here refer to the following HS-codes: 4415.10: cases, boxes, crates, drums (for powders, chemicals, cable-drums) and similar; and HS 4415.20: pallets, box pallets and other load boards, pallet collars.

3.2.1.2 Wooden packings, boxes, crates, cable drums, etc.

Indonesia was a non-significant player in the world trade in wooden packings, boxes, crates, etc. and did not rank among top-20. It only showed up more visibly in the Japanese imports,

holding a 5%-6% share in most years (Table 3.9). Price comparisons show a very mixed pattern, where Indonesian deliveries were priced much above the average imports up to 2000, after which they clearly declined below averages.

There have been major upheavals among the major suppliers to the world markets. Most notable is the rise of China into a dominant 67.5% position (Table 3.10). Market-losers have been the USA, France and Malaysia: the latter two have diminished into one fifth-one sixth of their former market shares in just five years. It is remarkable that very high unit values are in fact paid for this product category, at around $1,500 per ton. That is three times higher than for pallets, and several times higher than for some of the commodity wood products discussed in the previous chapters.

Table 3.9 Indonesia's role in Japan's trade in wooden packings, boxes, crates, cable drums, etc. 1998-2002

Japan's imports of packings, boxes, crates, etc. from:		1998	1999	2000	2001	2002
World	Mill. $	4,92	4,87	6,04	8,35	6,62
	1000 tons	3,29	3,64	4,98	5,26	3,88
Indonesia	Mill. $	0,27	0,33	0,32	0,22	0,40
	1000 tons	0,17	0,18	0,17	0,16	0,26
Indo market share	% (value)	5.5	6.7	5.3	2.7	6.0
	% (volume)	5.3	4.8	3.4	3.0	6.8
Unit value						
World	$/ton CIF	1495	1338	1213	1587	1706
Indonesia	$/ton CIF	1588	1833	1882	1375	1538
Difference	%	6.2	37.0	55.2	-13.4	-9.8

Source: COMTRADE 2003

3.2.1.3 Wooden pallets, box pallets, and other load boards

In wooden pallets, box pallets and load boards, the situation is again reviewed in the Japanese market, because Indonesia was insignificant in the world import picture. On the contrary to that, Indo pallets were the dominant item in the Japanese market with a growing 60% market share in 2002 (Table 3.11). Profit margins are normally very thin in pallet trade, so there is very little room for price cuts. The unit prices recorded for Indonesia were slightly below the world average in the imports to Japan. Malaysia used to be a n equal competitor to Indonesia in 1998, but it has since then lost market share rapidly, foremost in 2002 (Table 3.12). China

is a growing supplier but still far smaller player than Indonesia. Singapore has been pushed aside from the pallet market in Japan.

Table 3.10 Market shares of leading suppliers in Japan's trade in wooden packings, boxes, crates, cable drums, etc. 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CHINA	23.1	28.9	42.3	46.8	67.5
USA	26.4	26.5	15.0	11.9	10.7
INDONESIA	5.5	6.7	5.3	2.7	6.0
KOREA	2.2	2.1	4.1	5.7	3.1
MEXICO	n.a.	0.5	1.7	2.0	n.a.
FRANCE	10.7	3.2	2.1	1.6	2.4
TAIWAN P.O.C	3.9	5.2	5.3	2.2	2.3
VIETNAM	0.6	0.3	2.0	1.6	2.0
MALAYSIA	12.8	8.3	9.9	5.9	1.9

Source: COMTRADE 2003

Table 3.11 Indonesia's role in Japan's trade in wooden pallets, box pallets, etc. 1998-2002

Japan's imports of pallets, box pallets, load boards from:		1998	1999	2000	2001	2002
World	Mill. $	19,08	17,79	23,74	26,56	19,01
	1000 tons	42,65	37,19	49,17	52,57	37,32
Indonesia	Mill. $	6,91	7,65	12,01	16,03	11,39
	1000 tons	15,92	17,36	26,05	31,63	23,77
Indo market share	% (value)	36.2	43.0	50.6	60.3	59.9
	% (volume)	37.3	46.7	53.0	60.2	63.7
Unit value						
World	$/ton CIF	447	478	483	505	509
Indonesia	$/ton CIF	434	441	461	507	479
Difference	%	-3.0	-7.9	-4.5	0.3	-5.9

Source: COMTRADE 2003

Table 3.12 Market shares of leading suppliers in Japan's trade in wooden pallets, box pallets, load boards etc. 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
INDONESIA	36.2	43.0	50.6	60.3	59.9
CHINA	9.0	6.8	6.9	8.1	13.1
MALAYSIA	35.2	21.3	21.3	18.4	8.0
THAILAND	0.3	0.9	4.0	5.2	7.5
KOREA	1.3	2.8	2.8	2.1	2.8
GERMANY	0.5	0.6	0.2	0.4	2.3
SINGAPORE	9.9	12.2	8.5	1.8	1.4

Source: COMTRADE 2003

3.3 Further processed wood products

3.3.1 Profiled wood

Production of profiled hardwood, which mainly consists of mouldings, is usually the first, and often intermediate value-added processing stage for sawn hardwood. It means dimensional processing into tongued & grooved, rebated, chamfered, V-jointed, beaded, moulded, rounded, etc. The raw material is normally kiln-dried sawnwood, and it can be further (but not necessarily) planed, sanded, or finger-jointed before profiling is done. The relevant HS code is 4409.20. The heading also includes unassembled strips and friezes for parquet flooring. Profiled wood typically finds its applications in interior design, fittings, joinery and furniture. It has both direct uses and component functions in higher value-added products. On of the fastest-growing applications of "profiled wood" has been the decking segment for garden & outdoor applications.

World trade in profiled wood has been expanding fast, but growth has been merely a volume issue, as unit prices appear to have gone down sharply. According to COMTRADE figures, the value of world imports has practically remained unchanged in 1998-2002, while volumes have risen sharply – more than four-fold! In the light of the statistics at hand, it appears that the trade value is hovering around $1 bill., while the tons have exploded from less than one mill. in 1998 to nearly 4,5 mill. tons in 2002. As a result, the unit values show an unusual drop to around one fifth of the 1998 levels by 2002.

There may be a structural change in trade, sparked by entry of low-cost plantation woods into trade. It is debatable whether the distinction between sawnwood and profiled wood has remained clear-cut, or whether it has become yet another way of going around various trade controls and tariffs. At least experiences of Indonesia show that export taxes on sawnwood have induced the industry to invest heavily in moulding, because it is taxed less in exports.

Furthermore, the variability of statistical reporting causes uncertainty in this product category. Lack of North American volume data is a point of concern here, and the US imports have been shown separately to complement the global trade picture. USA imported worth $328 mill. of profiled wood in 2002, and its purchases have been in a steady increase. Indonesia used to be a big supplier to the US with 25%-27% shares in the late-1990s, but its role has thereafter shrunk to 7%. American countries (mainly Canada and Brazil) and China have expanded their sales to the US to the detriment of Indonesia. Indonesia remains a globally leading supplier, but it has only a narrow lead to China, which appears bound to surpass Indonesia during 2003-2004. The origin of change is the US imports, where China has made strong progress and Indonesia has suffered a downward trend (Table 3.14).

Table 3.13 Indonesia's role in world trade in profiled hardwood 1998-2002

OECD (excl. USA, Canada) profiled hardw. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	925,54	983,26	1 079,67	1 016,31	973,86
	1000 Tons	923,42	1 527,77	2 260,27	2 653,88	4 449,44
Indonesia	Mill. $	220,71	206,42	241,18	192,06	144,34
	1000 Tons	254,04	747,27	522,16	611,41	672,76
Indo market share	% (value)	23.8	21.0	22.3	18.9	14.8
	% (volume)	27.5	48.9	23.1	23.0	15.1
Unit value						
World	$/ton CIF	1002	644	478	383	219
Indonesia	$/ton CIF	869	276	462	314	215
Difference	%	-13.3	-57.1	-3.3	-18.0	-2.0
USA imports from:						
World	Mill. $	199,18	257,29	254,74	217,22	327,61
Indonesia	Mill. $	53,09	64,20	49,88	23,96	22,87
Indo market share	% (value)	26.7	25.0	19.6	11.0	7.0

Source: COMTRADE 2003
Note: Volumes exclude USA & Canada, which do not report it in COMTRADE

Table 3.14 Market shares of leading suppliers in world trade in profiled wood 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
INDONESIA*	23.1	20.6	20.4	16.3	11.9
CHINA	4.6	6.4	9.7	11.5	13.4
USA	9.5	9.6	9.3	9.0	9.1
CANADA	5.1	5.5	5.6	5.3	8.7
MALAYSIA	8.9	7.7	8.2	7.5	7.1
ITALY	8.6	7.8	6.6	7.2	6.7
BRAZIL	3.2	4.5	4.5	4.6	5.6
GERMANY	4.3	4.4	3.8	4.1	3.6

Source: COMTRADE 2003

* a global market share, differs from the two %-shares given in previous table

3.3.2 Builders' joinery and carpentry (BJC)

3.3.2.1 Definition

Builders' joinery and carpentry covers a wide range of value-added building products, mainly windows and their frames, doors and their frames, and assembled parquet panels for flooring. Relevant HS codes are: windows 4418.10, doors 4418.20 and "other BJC", namely parquet panels 4418.30, concrete shuttering 4418.40, other unspecified items 4418.90. The latter includes e.g. cellular wood panels.

3.3.2.2 Windows

In wooden windows, Indonesia was a very small player with its less than one per cent market share in world trade. Windows markets were left out of this preliminary analysis on global level, but they will be appropriately reviewed in the final report. Korea was a major market for Indonesian windows, so it has been separately reviewed here. The same principle applies to wooden packaging products, where Indonesia has only importance in some Asian markets.

Indonesia's market share in Korea has fallen from a dominant 50% level in 1998 to 39% in 2002 (Table 3.15). Indo supplies appear to have dipped in 2001, and recovered again in 2002 to their long-term level of around $2,0 mill. The trade value and volume are very small in

comparison with other wood products. In unit values of Korea's imports, Indo windows fetched around 25% lower prices than the average. USA and China have been able to expand their market shares in Korea's window imports, while Malaysia and Germany have lost, as also Indonesia (Table 3.16).

Table 3.15 Indonesia's role in Korea s trade in wooden windows 1998-2002

Korea's imports of windows from:		1998	1999	2000	2001	2002
World	Mill. $	4,99	3,67	4,81	2,39	5,49
	1000 tons	4,45	2,69	3,34	1,45	3,16
Indonesia	Mill. $	2,75	2,17	2,32	0,48	2,13
	1000 tons	3,14	2,13	2,15	0,51	1,65
Indo market share	% (value)	55.1	59.1	48.3	19.9	38.7
	% (volume)	70.5	79.1	64.4	35	52.2
Unit value						
World	$/ton CIF	1121	1364	1440	1648	1737
Indonesia	$/ton CIF	876	1019	1079	941	1291
Difference	%	-21.9	-25.3	-25.1	-42.9	-25.7

Source: COMTRADE 2003

Table 3.16 Market shares of leading suppliers in Korea's trade in wooden windows 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
INDONESIA	55.1	59.1	48.3	19.9	38.7
USA	20.4	31.7	27.1	59.4	28.2
CHINA	1.2	1.2	2.3	3.7	20.1
GERMANY	7.2	1.5	0.2	0.1	4.4
MALAYSIA	14.2	1.8	19.1	10.2	3.5

Source: COMTRADE 2003

A particular problem in window trade rests with the varied national building regulations, standards and dimensions. This makes it very difficult to enter the markets without a proper technical investigation and acceptable quality standards. It may be warranted to supply pre-cut components instead of ready-made windows and framers that may be easily rejected in the markets. Partly because of this, Indonesian meranti window scantlings have been a long-term raw material source for Western European factories. Both solid wood and glue-laminated scantlings have been used as components to European windows manufacturing, and Germany has been the major buyer.

3.3.2.3 Doors

Indonesia is a viable supplier of wooden doors to the world markets. It held around 10% markets shares steadily in 1998-2002 in value terms (excluding USA), but a more modest 2%-4% shares of volumes, which faltered during the period (Table 3.17). It was ranked second after Canada, and ahead of competitors such as Brazil and Malaysia. Among the industrialized countries, Canada has been winning market shares, while USA, Denmark and Sweden have all lost ground.

Table 3.17 Indonesia's role in world trade in wooden doors 1998-2002

OECD (excl.- USA) wooden doors imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	1 074,17	1 065,07	1 019,96	1 051,04	1 072,98
	1000 Tons	2 495,83	2 567,66	2 980,30	3 449,64	n.a.
Indonesia	Mill. $	105,98	98,11	109,8	100,37	102,2
	1000 Tons	99,61	71,95	66,26	82,18	49,94
Indo market share	% (value)	9.9	9.2	10.8	9.5	9.5
	% (volume)	4.0	2.8	2.2	2.4	n.a.
Unit value						
World	$/ton CIF	n.a.	n.a.	n.a.	n.a.	n.a.
Indonesia	$/ton CIF	1064	1364	1657	1221	n.a.
US imports from:						
World	Mill. $	264,16	348,7	433,09	478,92	529,62
	1000 units	7 237	9 979	11 866	12 538	13 508
Indonesia	Mill. $	12,99	18,59	20,87	14,86	17,57
	1000 units	593	806	998	690	823
Indo market share	% (value)	4.9	5.3	4.8	3.1	3.3
	% (units)	8.2	8.1	8.4	5.5	6.1
Unit value						
World	$/unit CIF	37	35	36	38	39
Indonesia	$/unit CIF	22	23	21	22	21
Difference	%	-40.0	-34.0	-42.7	-43.6	-45.5

Source: COMTRADE 2003

Note: US imports have been separated because the volume unit differs from others

Imports by the US have been separated again because of volumes reported in number of doors (instead of tons). 2002 data needs to be verified. In the US imports, Indonesia has similarly lost market share (3% of value of US imports). Heavily discounted unit prices have been allowed by Indonesian suppliers, as the price gap has remained at above 40% in the recent years. The low unit prices per door seem to reflect the tendency to supply unfinished or roughly finished doors, which are given the final touch in the importing country, and sold at several hundreds of per cents higher prices to builders and consumers.

Table 3.18 Market shares of leading suppliers in world trade in wooden doors 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CANADA	10.3	12.4	15.8	15.8	16.1
INDONESIA*	8.9	8.3	9.0	7.5	7.5
BRAZIL	4.4	4.7	5.1	5.5	5.7
MALAYSIA	4.5	5.1	5.6	4.9	5.5
USA	7.2	7.2	7.1	5.7	5.4
SWEDEN	6.5	6.8	5.7	5.6	5.3
ITALY	5.6	4.8	4.5	5	4.6
SOUTH AFRICA	n.a.	n.a.	3.3	3.4	4.3
DENMARK	6.0	4.0	2.5	5.2	4.0
GERMANY	5.7	5.9	4.8	4.7	3.9

Source: COMTRADE 2003

* a global market share, differs from the two %-shares given in previous table

3.3.2.4 Other BJC

World imports of "other BJC" has remained fairly unchanged in the period 1998-2002, i.e. at around $2,2-$2,4 bill. per year (Table 3.19). In the meanwhile, trade volume has risen to the level of 1,7 mill. tons, what means that unit price has fallen slightly. For Indonesia, this development has been the opposite, as it has been able to fetch higher unit prices over the years, but suffered diminishing market shares. Indonesia's role as a supplier went down to 4.7% of value and just 3.5% of volume in five years (to one third). These figures exclude trade with the USA. Indonesian products (mainly parquet) were priced 20% lower than world average in 1998-1999, while a few years later the situation had reversed into a 35% premium for Indonesian supplies. Presumably this is more related to a higher supply of low-value products from competitive sources than any dramatic improvement of Indonesian product quality.

Among the top-nine suppliers of "other BJC" to the world markets, Canada was the leader with a fairly stable 18% share, followed by Germany with equally stable 10% stake (Table 3.20). Austria has been able to expand its market share and pass Sweden, which has lost most severely among the top countries. China and Brazil are emerging suppliers with relatively fast

growth in market shares. The trade with US helped Indonesia to reach 4.4% global market share in 2002, but the diminishing trend prevailed.

Table 3.19 Indonesia's role in world trade in assembled parquet panels, concrete shuttering, other BJC 1998-2002

OECD (excl. USA) parquet, etc. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	2 236,38	2 416,99	2 465,40	2 329,53	2 320,03
	1000 Tons	1 245,59	1 464,55	1 731,57	1 720,72	1 690,71
Indonesia	Mill. $	173,01	160,17	170,53	108,28	108,53
	1000 Tons	122,58	122,07	105,41	62,56	58,38
Indo market share	% (value)	7.7	6.6	6.9	4.6	4.7
	% (volume)	9.8	8.3	6.1	3.6	3.5
Unit value						
World	$/ton CIF	1795	1650	1424	1354	1372
Indonesia	$/ton CIF	1411	1312	1618	1731	1859
Difference	%	-21.4	-20.5	13.6	27.8	35.5
USA imports from:						
World	Mill. $	673,76	968,48	883,82	856,69	953,85
Indonesia	Mill. $	36,79	37,31	55,78	37,85	35,35
Indo market share	% (value)	5.5	3.9	6.3	4.4	3.7

Source: COMTRADE 2003
Note: Volumes exclude USA, which does not report it in COMTRADE

Table 3.20 Market shares of leading suppliers in world trade in assembled parquet panels, concrete shuttering, other BJC 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CANADA	18.3	23.2	18.7	18.9	18.8
GERMANY	9.1	8.8	9.5	10.4	10.0
AUSTRIA	6.0	5.8	6.4	7.0	8.2
SWEDEN	12.1	9.5	8.1	7.1	7.9
INDONESIA*	7.2	5.8	6.8	4.6	4.4
CHINA	1.4	1.9	3.1	3.4	3.8
FINLAND	3.8	3.3	3.4	3.7	3.8
USA	4.1	4.2	4.3	3.8	3.6
BRAZIL	0.6	0.9	1.3	1.9	2.6

Source: COMTRADE 2003
* a global market share, differs from the two %-shares given in previous table

3.3.3 Wood carvings

HS-definition of 44.20 puts the following items under the heading wood carvings: wood marquetry and inlaid wood, caskets and cases for jewellery or cutlery, statuettes and

ornaments of wood, hand carved components/pieces of furniture. This product category is the first one that accommodates much more skilled handwork and artistic and design capabilities. All these factors are said to be widely available in Indonesia. Despite their perceived abundance, China has taken a controlling role in this trade area.

The world import figure is $1,1bill. and it has been in constant growth in 1998-2002 (Table 3.21). As the volumes of trade have grown in faster than values, the unit value has fallen year by year. Still, this product category reaps perhaps the highest unit values of all wood products, at around $6,000 per ton. For Indo products, the price level is half of that, but it has remained more stable than the world average import price. This trade measures a business of $60 mill. and 20,000 tons sold annually by Indonesia. It has not been able to keep its positions, as China and Thailand (to a lesser degree) have marched out to capture bigger market shares (Table 3.22).

When considering the low (5%) market share of Indonesia, it has to be noted that this product range is subject to out-sourcing and re-exports, what may explain the wide price gap between the global average and Indonesia. Countries like Taiwan and Singapore have become known for their wide-ranging out-sourcing in the neighboring countries. Indonesia is without a doubt one of the primary sources of fine carving work with its long traditions and abundant labor. It is relevant to remember that the domestic sales in tourist resorts do not count in foreign trade statistics.

Table 3.21 Indonesia's role in world trade in carvings (wood marquetry, inlaid wood, statuettes and ornaments, etc.) 1998-2002

OECD carvings, etc. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	931,57	1 022,10	1 123,35	1 103,94	1 142,14
	1000 Tons	116,1	133,55	174,34	183,97	201,73
Indonesia	Mill. $	63,26	70,39	67,53	65,18	60,1
	1000 Tons	17,96	19,34	18,9	21,79	18,67
Indo market share	% (value)	6.8	6.9	6.0	5.9	5.3
	% (volume)	15.5	14.5	10.8	11.8	9.3
Unit value						
World	$/ton CIF	8024	7653	6443	6001	5662
Indonesia	$/ton CIF	3522	3640	3573	2991	3219
Difference	%	-56.1	-52.4	-44.5	-50.2	-43.1

Source: COMTRADE 2003
Note: Volumes exclude USA, which does not report it in COMTRADE

Table 3.22 Market shares of leading suppliers in world trade in carvings (wood marquetry, inlaid wood, statuettes and ornaments, etc.) 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CHINA	39.8	43.9	49.7	52.2	54.9
INDONESIA	6.8	6.9	6.0	5.9	5.3
THAILAND	3.8	4.6	4.8	4.8	5.1
POLAND	3.5	3.5	3.8	3.1	3.6
INDIA	3.6	3.4	3.1	3.3	3.2
ITALY	4.6	3.5	3.5	3.3	3.1
TAIWAN P.O.C.	6.7	5.2	3.9	3.4	2.5

Source: COMTRADE 2003

3.3.4 Furniture

3.3.4.1 Definition

Wooden furniture is the biggest product group to be assessed in this study. It has been broken down into seven furniture categories, including furniture parts. The problem with "parts" is that all materials are included, not only wood. Based on previous studies, however, it can be assumed that majority of furniture parts entering world trade is in fact made of wood.

The following HS-codes are covered in the furniture chapters:

Table 3.23 Product coverage in furniture

Product description	HS-code	World imports 2002	Share
		$ mill.	%
Seats of rattan, osier, bamboo or similar	9401.50	351,91	1.1
'Other' seats with wooden frames	9401.61/69	7 356,75	23.2
Office furniture, of wood	9403.30	1 559,62	4.9
Kitchen furniture, of wood	9403.40	2 042,86	6.4
Bedroom furniture, of wood	9403.50	4 362,03	13.7
Other furniture, of wood	9403.60	11 436,80	36.0
Furniture parts of all materials	9403.90	4 633,82	14.6

3.3.4.2 Seats of bamboo, rattan, etc.

While the trade in seats made of rattan and bamboo is a minor part of world imports of all furniture, it is of great importance to Indonesia. Indonesia captured 60% of the world import value with its supplies in 2002 (without the US). The world import figure was at $233,6 mill. that year, slightly down from the prevailing $260 mill. level in the previous years (Table 3.24). The US imports have been separated of the total figure due to differences in volume reporting units. The US imported this product worth $118 mill. in 2002.

Table 3.24 Indonesia's role in world trade in seats of bamboo, rattan, etc. 1998-2002

OECD (excl.- USA) bamboo & rattan seats imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	265,77	266,83	263,09	243,95	233,56
	1000 Tons	416,68	472,46	440,02	379,32	382,17
Indonesia	Mill. $	162,63	163,19	155,46	145,41	139,66
	1000 Tons	229,65	221,44	224,27	207,77	236,06
Indo market share	% (value)	61,2	61,2	59,1	59,6	59,8
	% (volume)	55,1	46,9	51,0	54,8	61,8
Unit value						
World	$/ton CIF	638	565	598	643	611
Indonesia	$/ton CIF	708	737	693	700	592
Difference	%	11.0	30.5	15.9	8.8	-3.2
USA imports from:						
World	Mill. $	93,38	107,64	129,16	116,00	118,35
	1000 units	2 687	2 962	3 426	3 160	3 674
Indonesia	Mill. $	17,97	18,65	24,31	27,11	29,37
	1000 units	538	489	612	739	1088
Indo market share	% (value)	19.2	17.3	18.8	23.4	24.8
	% (volume)	20.0	16.5	17.9	23.4	29.6
Unit value						
World	$/unit	35	36	38	37	32
Indonesia	$/unit	33	38	40	37	27
Difference	%	-3.9	5.0	5.3	0.0	-16.2

Source: COMTRADE 2003

Note: US imports have been separated because the volume unit differs from others

In unit values, Indonesia has received premiums for its bamboo & rattan products in world imports, but this evaporated in 2002. Indonesia's unit value has fallen faster than in world imports on average. Unit values at around $600/ton were commonly paid for imported for rattan/bamboo seats in 2002. In the US market, unit values per piece are in the range of $30, and slightly falling on average, but more sharply for Indonesia in 2002.

China, Vietnam and Malaysia have been able to improve their market shares in world imports of rattan and bamboo seats. Indonesia's lead remains anyway comfortable at 48% (Table 3.25).

Table 3.25 Market shares of leading suppliers in world trade in seats of bamboo, rattan, etc. 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
INDONESIA*	50.3	48.6	45.8	47.9	48.0
CHINA	12.8	16.2	17.6	16.1	16.8
PHILIPPINES	14.9	14.8	14.2	13.6	12.4
VIETNAM	3.3	3.1	3.6	4.2	5.2
MALAYSIA	3.3	3.1	3.8	3.7	4.5

Source: COMTRADE 2003

* a global market share, differs from the two %-shares given in previous table

3.3.4.3 Seats with wooden frames

Wood-framed seats are more than ten times larger trade item than rattan and bamboo seats. World imports amounted to $4,8 bill. in 2002, out of which Indonesia supplied $158 mill. or just 3% (Table 3.26). But the US market, which has been separated again from world total due to statistical reporting problems, made up another $2,5 bill. import market, where Indonesia played a 4.3% role ($109 mill.). Altogether, its global market share was just below 4% in 2002 (Table 3.27). Indo seats were imported at clearly discounted (~50%) unit values. China and Poland are challenging the hegemony of Italy, world's wooden chair leader, in the competition for market shares.

Table 3.26 Indonesia's role in world trade in seats with wooden frames 1998-2002

OECD (excl.- USA) wooden seats imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	4 244,02	4 486,13	4 541,56	4 732,93	4 814,25
	1000 Tons	3 221,87	3 841,91	4 674,35	4 655,84	5 711,06
Indonesia	Mill. $	165,29	204,25	217,23	194,38	158,21
	1000 Tons	481,84	433,08	553,07	510,31	586,20
Indo market share	% (value)	3.9	4.6	4.8	4.1	3.3
	% (volume)	15.0	11.3	11.8	11.0	10.3
Unit value						
World	$/ton CIF	1317	1168	972	1017	843
Indonesia	$/ton CIF	591	684	476	534	455
Difference	%	-55.1	-41.4	-51.0	-47.4	-46.0
US imports from:						
World	Mill. $	1 531,73	1 863,82	2 214,97	2 146,65	2 542,50
	1000 units	36 314	41 831	42 001	39 836	47 385
Indonesia	Mill. $	63,68	90,73	107,15	110,14	109,26
	1000 units	1 148	1 482	1 743	1 974	2 046
Indo market share	% (value)	4.2	4.9	4.8	5.1	4.3
	% (volume)	3.2	3.5	4.2	5	4.3
Unit value						
World	$/unit	42	45	53	54	54
Indonesia	$/unit	55	61	61	56	53
Difference	%	30.1	35.6	15.1	3.7	-1.9

Source: COMTRADE 2003

Note: US imports have been separated because the volume unit differs from others

Table 3.27 Market shares of leading suppliers in world trade in seats with wooden frames 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
ITALY	28.9	27.5	27.5	27.3	25.0
CHINA	4.8	6.3	8.2	9.9	14.2
POLAND	8.8	9.1	9.1	10.2	10.5
MALAYSIA	5.3	5.9	5.6	4.4	4.4
CANADA	3.5	3.8	4.2	4.2	4.2
INDONESIA*	4.0	4.6	4.8	4.4	3.6
GERMANY	4.9	4.7	3.9	4.0	3.6

Source: COMTRADE 2003

* a global market share, differs from the two %-shares given in previous table

3.3.4.4 Wooden office furniture

In wooden office furniture, Indonesia is not a world player. Instead, it has found an interesting niche in Saudi Arabia (Table 3.28). Saudi Arabia's imports have nearly doubled in five years, but during that time Indonesia's role has halved. The market is still, however, small in size (compared with world imports $1,6 billion), and it deserves merely a cursory review as a reminder of the stiff competition even in the smaller, emerging markets. Judged from the heavy 60%-70% discounted unit values, the Indonesian suppliers are not well-placed in the Saudi market.

Italy, the USA and China were the top-three suppliers to Saudi Arabia (Table 3.29). China has gained more than 10%-points of foothold in five years, while Italy's role has declined. US and Malaysia are both winning gradually more of the market.

Technically advanced and design-savvy factories in the industrialized countries dominate office furniture trade with sophisticated, functional and ergonomic system furniture, mostly made of reconstituted panels with high-quality surfaces. The solid wood segment remains a highest quality prestige item, rather than a mainstream product.

Table 3.28 Indonesia's role in Saudi Arabia's trade in wooden office furniture 1998-2002

Saudi Arabia's wooden office furn. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	31,74	30,75	36,03	45,41	55,45
	1000 Tons	17,81	18,87	23,14	29,53	37,87
Indonesia	Mill. $	2,82	2,37	2,42	3,25	2,59
	1000 Tons	5,14	4,3	3,7	6,34	4,66
Indo market share	% (value)	8.9	7.7	6.7	7.2	4.7
	% (volume)	28.9	22.8	16	21.5	12.3
Unit value						
World	$/ton CIF	1782	1630	1557	1538	1464
Indonesia	$/ton CIF	549	551	654	513	556
Difference	%	-69.2	-66.2	-58.0	-66.7	-62.0

Source: COMTRADE 2003

Note: US imports have been separated because it reports no volumes

Table 3.29 Market shares of leading suppliers in Saudi Arabia's trade in wooden office furniture 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
ITALY	25.4	23.2	24.4	26.7	22.9
USA	15.1	18	17.5	14.2	18.5
CHINA	3.0	2.8	6.5	8.9	13.2
MALAYSIA	6.8	9.2	10.3	10.4	9.6
INDONESIA	8.9	7.7	6.7	7.2	4.7
TAIWAN P.O.C.	5.9	5.9	2.8	4.1	3.5

Source: COMTRADE 2003

3.3.4.5 Kitchen furniture

What was said about the office furniture dominated by manufacturers in industrialized countries holds fairly well true for kitchen furniture. Fitted kitchen furniture with sophisticated space, dimension and technology solutions, attuned with local tastes are the winning concept. Few suppliers from the tropical countries have made any greater presence in the world trade as a consequence.

Indonesia barely ranked among the top-20 suppliers in world trade with 0.5% share, so this chapter focuses only on Korean market. Indonesia held 9.4% market share of imports in 1998, but thereafter it has declined to less than 3.8%. Korean imports have showed an explosive growth in 2002 (to $55 mill.) with $40 mill. of new trade created in just four years time. Indonesia's unit values were 59% lower than in imports on average. Indonesia was the seventh biggest supplier to Korea, well behind the leading suppliers Germany, China and Italy. The two former ones have won new market, while Italy has faltered. Germany is considered as the world leader in kitchen furniture, with many of the innovations coming from their manufacturers.

Table 3.30 Indonesia's role in Korea's trade in wooden kitchen furniture 1998-2002

Korea's wooden kitchen furn. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	14,76	18,66	22,41	24,88	54,55
	1000 Tons	6,28	9,56	10,74	12,28	22,14
Indonesia	Mill. $	1,39	1,62	1,09	1,10	2,08
	1000 Tons	1,08	1,30	0,93	1,09	2,08
Indo market share	% (value)	9.4	8.7	4.8	4.4	3.8
	% (volume)	17.2	13.6	8.7	8.9	9.4
Unit value						
World	$/ton CIF	2350	1952	2087	2026	2464
Indonesia	$/ton CIF	1287	1246	1172	1009	1000
Difference	%	-45.2	-36.2	-43.8	-50.2	-59.4

Source: COMTRADE 2003

Note: US imports have been separated because it reports no volumes

Table 3.31 Market shares of leading suppliers in Korea's trade in wooden kitchen furniture 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
GERMANY	23.2	15.3	19.3	20.6	38.7
CHINA	4.0	6.9	11.9	17.6	19.7
ITALY	17.1	15.1	14.0	12.2	11.6
MALAYSIA	12.6	15.0	17.0	14.2	9.1
VIETNAM	6.2	15.1	11.3	9.3	7.1
THAILAND	18.4	17.6	15.5	11.0	4.9
INDONESIA	9.4	8.7	4.8	4.4	3.8

Source: COMTRADE 2003

3.3.4.6 Bedroom furniture

Wooden bedroom furniture is a $2 bill. market in import values, excluding the imports to the USA (Table 3.32). Volume of trade has been growing much faster than its value, so that the unit values have nearly halved in five years. This is mostly explained by the general opening of the trade to a greater number of tropical country suppliers, and more precisely by the strong entry of China in this segment. The unit value has dropped below $1,000/ton in 2002. Indonesia is a small player with 2.4% market share of all imports, and its unit values are just one quarter of world trade average levels. Trade value for Indonesia was around $50 mill. annually.

The US imported more than the rest of the world, i.e. $2,3 bill. in 2002, and Indonesia supplied $152 mill. (6.5%) of the total. The US was three times bigger market for Indonesian bedroom furniture than the rest of the world. The fast-growing out-sourcing business, and purchasing of semi-finished furniture into the US plants for assembly and finishing, may explain much of the trade patterns here.

Among the leading suppliers China's phenomenal growth has caused others to lose ground (Table 3.33). Only Brazil and Indonesia have been able to somehow cope with the situation, and win modest gains in market shares. But China appears to keep the market in a permanent grip. It held 25% of the world imports in 2002, what represents a rise of more than 21%-points in four years.

Table 3.32 Indonesia's role in world trade in wooden bedroom furniture 1998-2002

OECD (excl.- USA) wooden bedroom furn. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	2 078,98	2 076,56	2 025,76	2 008,74	2 043,10
	1000 Tons	1 272,78	1 523,88	1 629,41	1 903,34	2 117,26
Indonesia	Mill. $	51,29	60,65	53,66	52,16	48,54
	1000 Tons	147,35	135,86	114,63	123,44	112,18
Indo market share	% (value)	2.5	2.9	2.6	2.6	2.4
	% (volume)	11.6	8.9	7.0	6.5	5.3
Unit value						
World	$/ton CIF	1633	1363	1243	1055	965
Indonesia	$/ton CIF	398	343	291	286	242
Difference	%	-75.6	-74.8	-76.6	-72.9	-74.9
US imports from:						
World	Mill. $	945,84	1 298,23	1 687,45	1 839,99	2 318,93
Indonesia	Mill. $	77,65	115,92	130,86	130,48	151,78
Indo market share	% (value)	8.2	8.9	7.8	7.1	6.5

Source: COMTRADE 2003

Note: US imports have been separated because it reports no volumes

Table 3.33 Market shares of leading suppliers in world trade in wooden bedroom furniture 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CHINA	3.7	7.0	13.5	17.1	25.2
CANADA	10.5	11.0	11.3	10.9	9.4
ITALY	12.1	11.6	10.8	10.3	9.3
GERMANY	10.3	9.6	7.8	7.6	6.2
DENMARK	10.0	8.1	6.2	6.1	5.5
POLAND	6.3	5.4	5.5	5.0	4.6
INDONESIA*	4.3	5.2	5.0	4.7	4.6
BRAZIL	2.4	2.9	3.4	3.7	4.1

Source: COMTRADE 2003

* a global market share, differs from the two%-shares given in previous table

In the Japanese wooden bedroom imports, value of trade has grown steadily and reached $118 mill. in 2002 (Table 3.34). Indonesia was clearly a number-one source until 2002, when China overtook it with one third of both volume and value of imports to Japan (Table 3.35). In 2002 Indonesia held 21.5% of the value of trade. Vietnam and Thailand have strongly emerged to compete for market shares in Japan. Indo bedroom furniture was valued at around 18% lower level than all imports to Japan on average.

Table 3.34 Indonesia's role in Japan's trade in wooden bedroom furniture 1998-2002

Japan's wooden bedroom furn. Imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	73,64	85,46	101,24	118,91	117,77
	1000 Tons	33,83	44,4	50,4	63,02	65,56
Indonesia	Mill. $	35,65	39,17	33,12	34,85	25,32
	1000 Tons	20,51	24,35	20,31	22,55	17,23
Indo market share	% (value)	48.4	45.8	32.7	29.3	21.5
	% (volume)	60.6	54.8	40.3	35.8	26.3
Unit value						
World	$/ton CIF	2177	1925	2009	1887	1796
Indonesia	$/ton CIF	1738	1609	1631	1545	1470
Difference	%	-20.1	-16.4	-18.8	-18.1	-18.2

Source: COMTRADE 2003

Table 3.35 Market shares of leading suppliers in Japan's trade in wooden bedroom furniture 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CHINA	11.8	15.6	21.5	25.9	32.8
INDONESIA	48.4	45.8	32.7	29.3	21.5
MALAYSIA	11.7	13.0	19.5	16.2	13.8
VIETNAM	2.9	5.2	4.5	7.2	11.7
THAILAND	4.5	7.9	9.2	11.0	11.1
TAIWAN P.O.C.	5.0	3.6	4.0	3.6	3.1

Source: COMTRADE 2003

3.3.4.7 "Other" furniture

Most of international wooden furniture trade consists of unspecified "other" wooden furniture. It comprises common items like small and occasional furniture pieces, living & dining room furniture sets, shop furniture and shelves, and other miscellaneous items. Living & dining room sets are the most common types and are presumably forming the bulk of goods traded in this category.

The world imports (excluding the USA) exceeded $7 bill. in 2002 (Table 3.36). Indonesia's share has remained steadily at around 6%. In same year, the USA imported alone nearly $4,4 bill. of these items, and Indonesia has become a reckoned supplier with a 6% share (Table 3.36). Indo supplies to "world" market was $431 mill., and to the USA $247 mill. Price data shows a narrowing, but yet large, gap between Indonesian and average import prices in the world market.

Table 3.36 Indonesia's role in world trade in "other" wooden furniture 1998-2002

OECD (excl.- USA) "other" wooden furn. imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	6 336,43	6 705,58	6 860,02	6 907,95	7 079,78
	1000 Tons	5 366,75	7 425,81	7 998,73	7 564,48	8 478,10
Indonesia	Mill. $	336,87	407,58	456,95	438,71	430,67
	1000 Tons	974,31	1 588,62	895,91	890,36	840,6
Indo market share	% (value)	5.3	6.1	6.7	6.4	6.1
	% (volume)	18.2	21.4	11.2	11.8	9.9
Unit value						
World	$/ton CIF	1181	903	858	913	835
Indonesia	$/ton CIF	346	257	510	493	512
Difference	%	-70.7	-71.6	-40.5	-46.0	-38.6
US imports from:						
World	Mill. $	2 505,28	3 063,31	3 653,04	3 648,78	4 357,02
Indonesia	Mill. $	151,61	197,56	228,81	236,8	246,65
Indo market share	% (value)	6.1	6.4	6.3	6.5	5.7

Source: COMTRADE 2003
Note: US imports have been separated because it reports no volumes

Indonesia ranked third in the world imports of "other" wooden furniture after China and Italy (Table 3.37). China has pushed hard the leading European suppliers and as a result, all Western European top-suppliers have lost ground. Only Poland has been able to compete and succeed in raising its market share. Canada and Malaysia have remained on a plateau.

Table 3.37 Market shares of leading suppliers in world trade in "other" wooden furniture 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CHINA	9.7	12.3	15.9	17.6	22.4
ITALY	12.9	11.1	9.7	9.8	8.7
INDONESIA*	5.5	6.2	6.5	6.4	5.9
POLAND	4.3	4.1	4.6	4.8	5.2
CANADA	5.2	5.6	6.0	5.6	5.2
GERMANY	6.4	6.0	5.2	5.1	4.8
DENMARK	6.9	6.1	5.0	4.8	4.3
MALAYSIA	3.6	4.2	4.7	4.1	4.0

Source: COMTRADE 2003
* a global market share, differs from the two %-shares given in previous table

3.3.4.8 Furniture parts

Indonesia is not an important source of furniture parts in the world imports. It ranked 19th in 2002 with a 1.5% market share worldwide. In Japan, it featured more prominently, by supplying 9% of imported furniture parts in 2002 (Table 3.38). Unit values paid for Indo parts were roughly one third below those for the imported parts on average.

Table 3.38 Indonesia's role in Japan's trade in furniture parts 1998-2002

Japan's furniture parts Imports from:	Unit	1998	1999	2000	2001	2002
World	Mill. $	222,32	238,86	300,99	291,01	289,77
	1000 Tons	76,28	85,49	102,09	104,45	114,03
Indonesia	Mill. $	27,35	25,78	26,76	26,62	25,98
	1000 Tons	14,96	14,15	13,11	14,42	15,21
Indo market share	% (value)	12.3	10.8	8.9	9.1	9.0
	% (volume)	19.6	16.6	12.8	13.8	13.3
Unit value						
World	$/ton CIF	2915	2794	2948	2786	2541
Indonesia	$/ton CIF	1828	1822	2041	1846	1708
Difference	%	-37.3	-34.8	-30.8	-33.7	-32.8

Source: COMTRADE 2003

Indonesia was the fourth largest supplier of furniture parts to Japan, after China, Austria, and Taiwan (P.O.C) (Table 3.39). Austria and Germany have both increased their presence in Japanese furniture parts market, and Austria has been even more successful than China in relative terms. Indonesia belongs to the falling suppliers together with Taiwan, Thailand and the USA, to mention a few. Also Vietnam, Philippines and Malaysia have slipped from their former positions.

Table 3.39 Market shares of leading suppliers in Japan's trade in furniture parts 1998-2002

Supplier	Market share (% of world import value)				
	1998	1999	2000	2001	2002
CHINA	12.3	13.1	13.1	14.8	18.1
AUSTRIA	4.4	6.4	8.4	12.1	13.0
TAIWAN	13.7	13.9	14.3	12.3	12.3
INDONESIA	12.3	10.8	8.9	9.1	9.0
THAILAND	12.4	13.6	12.4	9.2	8.4
KOREA	3.2	3.3	3.4	4.2	6.6
GERMANY	3.3	2.9	3.0	4.5	5.7
ITALY	5.5	3.8	4.9	5.1	5.1
VIETNAM	5.0	5.9	4.3	4.5	4.3
PHILIPPINES	4.8	7.1	7.3	7.0	4.1
USA	7.7	5.1	5.9	5.0	3.6
MALAYSIA	6.5	6.3	4.5	4.1	3.3

Source: COMTRADE 2003

4 STRUCTURE AND MARKET FOCUS OF INDONESIAN WOOD PRODUCTS EXPORTS

4.1 Primary processed wood products

In the last four years, Indonesian exports of wood products to the world market have been relatively balanced between primary and secondary processed wood products. Total export value of Indonesian wood products in 1998 accounted for USD 7,219 bill. (Table 4.1). Of this amount, the share of primary wood products accounted for 47.0% and secondary wood products accounted for 53.0%. In 2001, the share of primary wood products had increased up to 54.6% and export share of secondary wood products decreased up to 45.4%.

In the last four years, Indonesian export of primary wood products to the world market had still been dominated by plywood, then followed by wood pulp and sawnwood (Table 4.2). In 1998, total export value of primary wood products was USD 3,4 billion. Of this amount, export share of plywood accounted for 44.9%, wood pulp 22.9% and sawnwood 7.7%. In 2000, total export value of Indonesian wood products increased up to USD 5,578 bill., then decreased in 2001. In 2001, total export value of primary wood products increased up to USD 4,994 billion. However, export share of plywood to that amount declined up to 36.8%. Export share of wood pulp and sawnwood to that amount increased to 11.3% and 16.1%, respectively.

Table 4.1 Indonesian export value of wood products to world market, 1998-2001

World Market	Primary Wood Products		Secondary Wood Products		Total Wood Products*	
Year	1000 US$	%	1000 US$	%	1000 US$	%
1998	3,392,027	46.99	3,827,000	53.01	7,219,027	100
1999	4,711,030	52.43	4,275,000	47.57	8,986,030	100
2000	5,578,100	54.64	4,631,000	45.36	10,209,100	100
2001	4,993,990	54.55	4,161,000	45.45	9,154,990	100

Sources: FAOSTAT, 2003 and COMTRADE, 2003 (data processed)
* excluding pulp products exports

Table 4.2 Indonesian exports of primary processed wood products to the world markets, 1998-2001

World Market	Plywood		Wood Pulp		Sawnwood		Total Primary Wood Products	
Year	Value 1000 US$	%	Value 1000 US$	%	Value 1000 US$	%	Value 1000 US$	%
1998	1,524,000	44.9	778,397	22.9	262,777	7.7	3,392,027	100
1999	2,894,000	61.4	487,981	10.4	264,822	5.6	4,711,030	100
2000	1,996,058	35.8	727,085	13.0	607,598	10.9	5,578,100	100
2001	1,837,915	36.8	563,254	11.3	801,843	16.1	4,993,990	100

Source: FAOSTAT, 2003 (data processed)

Indonesia's pulp exports recorded by the industry's central association APKI are in Table 4.3.

Table 4.3 Indonesia's Pulp Exports 1996-2000

Year	1996	1997	1998	1999	2000
	Tons				
Chemical hardwood pulp	1 127 390	1 186 020	1 656 740	1 179 400	1 329 460

Source: APKI

4.1.1 Sawn hardwood

Indonesian sawnwood was mostly exported to Asian markets, China and Japan. The other relatively important markets were Korea Rep., USA and the Netherlands, while UK and Germany were less important (Table 4.4). In 1997, its export value to China accounted for USD 45,6 mill., which contributed some 0.16% to total value of world sawnwood import. Its export values to Japan and Korea accounted respectively for USD 85,3 mill. and USD 17,2 mill., and contributed to total value of world sawnwood import some 0.30% and 0.06% respectively. Indonesia's exports to China accounted for 3.35% of China's imports. Contribution of its export values to Japan and Korea to total Japan and Korea imports in sawnwood reached at 1.75% and 3.80% respectively. Export value to China was 18.13% of Indonesia's sawn hardwood trade, or 0.90% of total export value of its primary wood products. Contribution of its export values to Japan and Korea accounted for 33.93% and 6.84% of Indo exports, or 1.68% and 0.34% of its total export value of primary wood products, respectively.

Indonesian sawnwood exports to the three Asian markets increased, and most notably to China. In 2001, its export value to China was already USD 433,5 mill. (nearly ten-fold to 1998 level). Its exports to Japan and Korea increased up to USD 94,1 mill. and USD 53.3 mill. In China's total imports of sawnwood, Indonesia's contribution increased notably: from 3.35% in 1997 to 27.82% in 2001. In Japan and Korea, sawnwood imports from Indonesia increased up to 3.50% from 1.75%, and to 23.83% from 3.80% over 1997-2001.

Indonesia's export value to China accounted for 54.06% role of its exports, compared to 18.13% in 1997. Contrary to this, exports to Japan and Korea diminished to 11.73% from 33.93% in 1997 and 6.65% from 6.84% in 1997, respectively. In total value of primary wood products, the contribution of the Chinese market increased to 8.68% from 0.90% in 1997.

The other sizeable markets were USA and the Netherlands. In 1997, Indo export value to USA accounted for USD 22.2 mill., while its export value to Netherlands accounted for USD 4.4 mill. Different from Asian markets behavior, Indonesian sawnwood exports to the USA and the Netherlands tended to decrease.

Table 4.4 Indonesian export of sawn hardwood to major international markets

Major Internatio-nal Market	Value 1000 US$	% of total export value of sawnwood	% of total export value of primary wood products	% of total import value of sawnwood of importing country	% of total world import value of sawnwood
China					
1997	45,595	18.13	0.90	3.35	0.16
1998	76,549	29.13	2.26	7.64	0.33
1999	15,264	5.76	0.32	1.54	0.06
2000	238,994	39.33	4.28	16.02	0.94
2001	433,498	54.06	8.68	27.82	1.88
Japan					
1997	85,342	33.93	1.68	1.75	0.30
1998	49,616	18.88	1.46	2.09	0.21
1999	26,305	9.93	0.56	0.88	0.10
2000	85,080	14.00	1.53	2.63	0.34
2001	94,063	11.73	1.88	3.50	0.41
Korea, Rep.					
1997	17,217	6.84	0.34	3.80	0.06
1998	3,753	1.43	0.11	2.27	0.02
1999	60,716	22.93	1.29	23.27	0.24
2000	48,258	7.94	0.87	19.68	0.19
2001	53,320	6.65	1.07	23.83	0.23
USA					
1997	22,173	8.81	0.44	0.29	0.08
1998	19,807	7.54	0.58	0.30	0.08
1999	7,947	3.00	0.17	0.10	0.03
2000	12,240	2.01	0.22	0.17	0.05
2001	3,782	0.47	0.08	0.06	0.02
Netherlands					
1997	4,426	1.76	0.09	0.48	0.02
1998	14,461	5.50	0.43	1.69	0.06
1999	2,439	0.92	0.05	0.28	0.01
2000	12,507	2.06	0.22	1.50	0.05
2001	2,180	0.27	0.04	0.33	0.01

Source: FAOSTAT, 2003 (data processed)

4.1.2 Tropical plywood

Indonesian plywood was largely exported to traditional markets in Japan, China and the USA. The next largest markets were Korea, Saudi Arabia, the UK and Germany (Table 4.5). In 1997, its export value to Japan accounted for USD 1,32 bill., which was 14.9% to total value of world plywood imports. Its export value to China and USA accounted for USD 676,3 mill. and USD 347,4 or 7.6% and 3.9% of world imports, respectively. Indonesia's export value to Japan constituted some 51.3% of imports in that market, compared with 48.4% in the China

and 45.8% in the USA. Indonesia's plywood exports to Japan were 38.8% of its total export value, and constituted 26.0% of total export value of Indonesia's primary wood products exports. In China and USA plywood deliveries made up 19.8% and 10.2% of all Indo exports. This meant 13.3% and 6.8% of total export value of primary wood products, respectively.

However, Indonesian plywood export to these three traditional markets has tended to decline. In 2001, its export value to Japan went down to USD 735,3, dropping Indo market share of world plywood imports to 10.8% from 14.9% in 1997. Its export values to China and USA decreased to USD 124,1 mill. and USD 192,3 mill. In Japan's total imports of plywood, Indo contribution fell to 43.3% in 2001 from 51.3% in 1997. Similar slides were experienced in China (down to 22.0% from 48.4%) and USA (22.2% from 45.8%).

Other important markets for Indonesian plywood were Rep. of Korea and Saudi Arabia. In 1997, its export value to Korea accounted for USD 173,3 mill., and USD 130,6 mill. to Saudi Arabia. Indonesian plywood exports to these two market destinations declined by the year 2001.

Table 4.5 Indonesian exports of tropical plywood to major international markets

Major Internatio-nal Market	Value 1000 US$	% of total export value of plywood	% of total export value of primary wood products	% of total import value of plywood of importing country	% of total world import value of plywood
Japan					
1997	1,324,779	38.78	26.01	51.27	14.94
1998	538,094	35.31	15.86	42.91	8.55
1999	996,249	34.42	21.15	51.57	13.69
2000	845,797	42.37	15.16	44.65	11.55
2001	735,261	40.01	14.72	43.30	10.80
China					
1997	676,272	19.80	13.28	48.44	7.63
1998	331,582	21.76	9.78	37.62	5.27
1999	431,702	14.92	9.16	52.48	5.93
2000	191,264	9.58	3.43	24.00	2.61
2001	124,119	6.75	2.49	22.03	1.82
USA					
1997	347,399	10.17	6.82	45.79	3.92
1998	170,096	11.16	5.01	25.24	2.70
1999	354,418	12.25	7.52	39.68	4.87
2000	209,421	10.49	3.75	24.47	2.86
2001	192,296	10.46	3.85	22.16	2.83
Korea, Rep.					
1997	173,298	5.07	3.40	38.59	1.95
1998	65,427	4.29	1.93	42.38	1.04
1999	140,908	4.87	2.99	54.13	1.94
2000	102,417	5.13	1.84	33.37	1.40
2001	115,000	6.26	2.30	36.86	1.69
Saudi Arabia					
1997	130,551	3.82	2.56	93.11	1.47
1998	88,239	5.79	2.60	93.86	1.40
1999	76,581	2.65	1.63	95.29	1.05
2000	69,689	3.49	1.25	61.83	0.95
2001	65,017	3.54	1.30	60.02	0.96
UK					
1997	96,855	2.84	1.90	19.59	1.09
1998	58,457	3.84	1.72	13.31	0.93
1999	97,933	3.38	2.08	21.69	1.35
2000	61,394	3.08	1.10	14.07	0.84
2001	63,949	3.48	1.28	13.95	0.94
Germany					
1997	47,687	1.40	0.94	8.28	0.54
1998	34,891	2.29	1.03	6.32	0.55
1999	46,369	1.60	0.98	9.09	0.64
2000	37,534	1.88	0.67	7.68	0.51
2001	32,764	1.78	0.66	7.66	0.48

Source: FAOSTAT, 2003 (data processed)

A closer look at APKINDO's export statistics (Table 4.6, Table 4.7) reveals that the ordinary plywood still dominates exports, despite the frequently mentioned attempts to add more value to the products through special overlays, etc.

Table 4.6 Exports of all types of plywood by countries in 2002

Countries			Country shares%	
	m^3	1,000 USD FOB	m^3	USD FOB
US, Can, Mex	762,813	242,943	11.3	12.7
UK/Ireland	230,635	65,578	3.4	3.4
Europe continental	423,549	145,427	6.3	7.6
China	373,510	122,503	5.5	6.4
Hong Kong	147,963	33,837	2.2	1.8
Taiwan	362,173	74,585	5.4	3.9
S:pore	129,470	30,253	1.9	1.6
Other ASEAN	97,146	15,437	1.4	0.8
Middle East trad.	754,591	195,305	11.2	10.2
Other Middle East	165,037	37,642	2.4	2.0
Japan	2 563,816	759,856	38.0	39.9
Other	644,712	149,114	9.5	7.8
Total	**6 753,071**	**1 906,117**	**100.0**	**100.0**

Source: APKINDO export statistics (2003)

Table 4.7 Exports of secondary processed plywood by countries in 2002

Countries			Country shares%		Share
	m^3	1,000 USD FOB	M^3	USD FOB	Secon-dary%
US, Can, Mex	132,254	74,824	11.8	17.4	17.3
UK/Ireland	18,170	7,346	1.6	1.7	7.9
Europe continental	179,341	77,213	15.9	18.0	42.3
China	114,962	39,300	10.2	9.1	30.8
Hong Kong	10,021	4,037	0.9	0.9	6.8
Taiwan	8,714	2,038	0.8	0.5	2.4
S:pore	24,209	7,734	2.2	1.8	18.7
Other ASEAN	5,742	2,100	0.5	0.5	5.9
Middle East trad.	313,169	97,793	27.8	22.8	41.5
Other Middle East	25,270	7,029	2.2	1.6	15.3
Japan	186,102	67,647	16.5	15.7	7.3
Other	76,548	28,204	6.8	6.6	11.9
Total	**1 125,224**	**429,593**	**100.0**	**100.0**	**16.7**

Source: APKINDO export statistics (2003)

4.1.3 Wood pulp

Some highlights of Indonesia´s pulp industry:

- Indonesia´s pulp and paper industry went through a major expansion in the 1990s.
- As a result, there are several world-class pulp exporters in the country, and exports have gone above 1 mill. tons per year levels.
- Asian economic crisis left many of the new mills suffering from heavy losses as their foreign currency loans became a punishing financial burden. On the other hand, rupiah's fall fattened the profit margins from foreign currency priced exports. Production costs were cut to almost one third, while international market price (Dollar & Euro based) remained lucrative. This increased their profitability.
- The industry still relies with few exceptions on mixed tropical hardwoods as their raw material, and sells its output to world markets as a product known as MTP or mixed-hardwood pulp, which fetches lower prices than eucalyptus or softwood pulp grades.

Indonesian wood pulp was mostly exported to two Asian markets, China and Rep. of Korea. The others like Japan, the Netherlands and France, the UK and USA were less important (Table 4.8). In 1997, its export value to China accounted for USD 221,6 mill., which contributed some 1.33% to total value of world wood pulp import. In total Chinese imports of wood pulp, Indonesia reached a 17.61% share. Contribution of China's market accounted for 41.63% of Indonesia's export value, or 4.35% of total export value of Indonesia's all primary wood products.

Indonesian wood pulp exports to these three Asian markets increased, but not very rapidly. In 2001, its export value to China increased up to USD 232,0 mill. Its export values to Korea and Japan increased up to USD 111,4 mill. and USD 38,9 mill., respectively. The other markets worth mentioning were the Netherlands and France, the former moving down, and the latter growing.

Table 4.8 Indonesian export of wood pulp to major international markets

Major Internatio-nal Market	Value 1000 US$	% of total export value of wood pulp	% of total export value of primary wood products	% of total import value of wood pulp of importing country	% of total world import value of wood pulp
China					
1997	221,645	41.63	4.35	17.61	1.33
1998	298,998	38.41	8.81	21.18	1.85
1999	196,961	40.36	4.18	10.39	1.16
2000	345,576	47.53	6.20	13.71	1.53
2001	231,955	41.18	4.64	9.02	1.29
Korea, Rep.					
1997	97,911	18.39	1.92	10.66	0.59
1998	79,816	10.25	2.35	10.60	0.49
1999	130,456	26.73	2.77	13.55	0.77
2000	135,165	18.59	2.42	10.35	0.60
2001	111,437	19.78	2.23	11.46	0.62
Japan					
1997	20,447	3.84	0.40	1.20	0.12
1998	38,809	4.99	1.14	2.60	0.24
1999	21,074	4.32	0.45	1.49	0.12
2000	44,715	6.15	0.80	2.41	0.20
2001	38,891	6.90	0.78	3.12	0.22
Netherlands					
1997	28,770	5.40	0.56	4.72	0.17
1998	26,798	3.44	0.79	3.99	0.17
1999	19,355	3.97	0.41	3.35	0.11
2000	40,583	5.58	0.73	7.22	0.18
2001	26,686	4.74	0.53	5.61	0.15

Source: FAOSTAT, 2003 (data processed)

4.2 Further processed wood products

Further processed wood products had significant share in Indonesian exports of wood products (more than 40%), and some items held a strong grip on international markets (Table 4.9). Those that had a global import market share of more than 10% were seats of bamboo/rattan (50%) and profiled hardwood (20%). Those with a market share between 5%-10% were wooden doors (9%), builders' wood n.e.s. (6%), wood carvings (6%), wood furniture n.e.s. (6%), wood bedroom furniture (5%), and wood picture frames (5.5%). Overall, market share of Indonesia in world market for secondary wood products accounted for about 5% but generally tended to slightly decline.

Table 4.9 Share of Indonesian exports of further processed wood products in the world market, 1998-2002

Secondary Wood Products	Share in World Market				
	1998	1999	2000	2001	2002
Profiled hardwood	*23.1*	*20.6*	*20.4*	*16.3*	*11.9*
Particleboard (wood)	*1.1*	*0.7*	*0.6*	*0.5*	*0.4*
Fiberboard den>0.8g/cm^3	*1.7*	*2.1*	*1.1*	*0.4*	*0.3*
Wood boxes/drums/cases	**0.2**	**0.3**	**0.2**	**0.3**	**0.4**
Wood pallets etc	**0.8**	**0.8**	**1.2**	**1.5**	**1.3**
Wooden Windows/Frames	*1.2*	*0.8*	*1.2*	*0.7*	*0.8*
Wooden Doors/Frames	*8.9*	*8.3*	*9.0*	*7.5*	*7.5*
Builders Wood n.e.s	*7.2*	*5.8*	*6.8*	*4.6*	*4.4*
Wood Picture etc Frames	**4.8**	**5.5**	**5.9**	**5.9**	**6.0**
Wood Table/Kitchen Ware	*2.1*	*2.0*	*2.1*	*1.6*	*1.1*
Wood Marquetry/Carvings	*6.8*	*6.9*	*6.0*	*5.9*	*5.3*
Bamboo/etc Seats/Chaires	50.3	48.6	45.8	47.9	48.0
Seats n.e.s Wood Frames	*4.0*	*4.6*	*4.8*	*4.4*	*3.6*
Wood Office Furniture	**0.6**	**0.5**	**0.5**	**0.7**	**0.8**
Wood Kitchen Furniture	*0.8*	*0.7*	*0.7*	*0.6*	*0.5*
Wood Bedroom Furniture	4.3	5.2	5.0	4.7	4.6
Wood Furniture n.e.s	5.5	6.2	6.5	6.4	5.9
Furniture Parts	*1.9*	*1.8*	*1.8*	*1.6*	*1.5*
Total Share in World Market	***4.8***	***4.9***	***5.1***	***4.6***	***4.2***

Source: COMTRADE, 2003 (data processed)

Bold: increasing *Italic: declining* Underlined: relatively stable

Of the 18 individual secondary wood products, 12 wood products that represented more than 1% in world market share were identified, and are discussed in the following sections of this chapter.

4.2.1 Profiled hardwood

Indonesian profiled hardwood products were mainly exported to developed markets like the USA, Japan, and Italy. The other major importing countries were the Netherlands, Rep. Korea, UK, and Australia (Table 4.10). In 1998, its export value to the USA accounted for USD 53,1 mill. – worth 4.4% of world imports. Indonesian exports to Japan and Italy were USD 52,7 mill. and USD 40.0 mill., respectively. Of the total value of world imports, these trade flows represented 4.37% and 3.32%. Indonesia held a 26.65% market share in the US imports in profiled hardwood in 1998. Similarly, high shares were recorded in Japan and Italy (36.67% and 35.32%).

Indonesian exports to the USA, Japan, and Italy, declined in the period 1998-2002. In 2002, its export value to the USA was only USD 22,9 mill. Its export values to Japan and Italy faltered to USD 35,6 mill. and USD 19,7 mill. by 2002. Indo market share in USA's imports declined to 6.98% from 26.65% in 1998. Lower market shares were realized in Japan and Italy: in both markets Indo market shares were halved.

4.2.2 Builders' joinery and carpentry (BJC)

4.2.2.1 Wooden doors

Indonesian wooden doors & frames (WDF) found major markets in the UK, Japan, and the USA. The other major importing countries were the Netherlands, Australia, Rep. Korea, and France (Table 4.11). In 1998, its export value to the UK accounted for USD 38,6 mill. and its contribution to total value of world WDF import accounted for 2.88%. Its export values to Japan and the USA accounted for USD 14,8 mill. and USD 13,0 mill., respectively. Its contribution to total value of world WDF import constituted some 1.11% for Japan and 0.97% for the USA. In the UK, Indonesian doors reached a market share of 21.88%. In Japan and the USA Indo doors reached 15.89% and 4.92% shares of imports. Exports to the UK accounted for 32.4% of all Indo door exports, and 2.02% of total export value of secondary wood products by Indonesia. Japan and the USA absorbed 12.4% and 10.9% of Indo door exports.

Indonesia managed to increase its deliveries of WDF to all three key markets. By 2002, its export value to the UK increased had shot up to USD 38,7 mill. Its export values to Japan and the USA increased to USD 16,4 mill. and USD 17,6 mill., respectively.

Table 4.10 Indonesian exports of profiled hardwood to major international markets, 1998-2002

Major Internatio-nal Markets	Value 1000 US$	% of total export value of profiled hardwood	% of total export value of secondary wood products	% of total import value of profiled hardwood of importing country	% of total world import value of profiled hardwood
USA					
1998	53,089	19.1	2.77	26.65	4.40
1999	64,199	23.4	3.00	24.95	4.82
2000	49,884	16.9	2.15	19.58	3.45
2001	23,960	11.0	1.15	11.03	1.79
2002	22,866	13.4	1.14	6.98	1.59
Japan					
1998	52,658	18.9	2.75	36.67	4.37
1999	55,369	20.2	2.59	31.86	4.16
2000	52,294	17.7	2.26	25.08	3.62
2001	43,541	19.9	2.09	22.67	3.25
2002	35,568	20.8	1.78	19.69	2.48
Italy					
1998	39,984	14.4	2.09	35.32	3.32
1999	32,572	11.9	1.52	27.82	2.45
2000	24,859	8.4	1.07	21.62	1.72
2001	19,103	8.7	0.92	16.94	1.43
2002	19,662	11.5	0.98	15.97	1.37
Netherlands					
1998	21,202	7.6	1.11	38.21	1.76
1999	21,397	7.8	1.00	34.47	1.61
2000	27,355	9.3	1.18	38.44	1.89
2001	24,501	11.2	1.18	34.61	1.83
2002	23,569	13.8	1.18	33.53	1.64
Korea					
1998	23,483	8.4	1.23	69.68	1.95
1999	17,201	6.3	0.80	65.20	1.29
2000	18,212	6.2	0.79	60.60	1.26
2001	20,311	9.3	0.98	69.18	1.52
2002	15,152	8.9	0.76	51.61	1.06
UK					
1998	11,602	4.2	0.61	13.76	0.96
1999	12,432	4.5	0.58	12.76	0.93
2000	14,588	5.0	0.63	14.26	1.01
2001	8,992	4.1	0.43	9.12	0.67
2002	11,378	6.7	0.57	9.84	0.79
Australia					
1998	7,918	2.8	0.41	22.35	0.66
1999	6,312	2.3	0.30	18.56	0.47
2000	11,447	3.9	0.49	24.16	0.79
2001	8,330	3.8	0.40	27.54	0.62
2002	13,415	7.8	0.67	33.31	0.94

Source: COMTRADE, 2003 (data processed)

Table 4.11 Indonesian exports of wooden doors to major international markets

Major International Markets	Value 1000 US$	% of total export value of wooden doors/ frames	% of total export value of secondary wood products	% of total import value of wooden doors/ frames of importing country	% of total world import value of wooden doors/ frames
UK					
1998	38,586	32.4	2.02	21.88	2.88
1999	34,697	29.7	1.62	18.30	2.45
2000	40,192	30.8	1.74	19.41	2.77
2001	35,842	31.1	1.72	16.68	2.34
2002	38,655	32.3	1.93	14.95	2.41
Japan					
1998	14,804	12.4	0.77	15.89	1.11
1999	16,639	14.3	0.78	16.16	1.18
2000	16,633	12.7	0.72	14.51	1.14
2001	16,024	13.9	0.77	15.91	1.05
2002	16,401	13.7	0.82	16.38	1.02
USA					
1998	12,987	10.9	0.68	4.92	0.97
1999	18,589	15.9	0.87	5.33	1.31
2000	20,873	16.0	0.90	4.82	1.44
2001	14,856	12.9	0.71	3.10	0.97
2002	17,567	14.7	0.88	3.32	1.10
Netherlands					
1998	11,266	9.5	0.59	30.15	0.84
1999	11,935	10.2	0.56	30.35	0.84
2000	13,280	10.2	0.57	36.53	0.91
2001	13,829	12.0	0.66	40.64	0.90
2002	15,346	12.8	0.77	39.67	0.96
Australia					
1998	8,337	7.0	0.44	40.66	0.62
1999	9,651	8.3	0.45	38.55	0.68
2000	12,148	9.3	0.52	43.09	0.84
2001	8,719	7.6	0.42	46.57	0.57
2002	12,413	10.4	0.62	48.63	0.77
Korea Rep					
1998	13,252	11.1	0.69	59.75	0.99
1999	8,254	7.1	0.39	44.83	0.58
2000	8,814	6.7	0.38	49.13	0.61
2001	10,542	9.1	0.51	40.34	0.69
2002	9,071	7.6	0.45	25.91	0.57

Source: COMTRADE, 2003 (data processed)

4.2.2.2 Other BJC

Indonesian other builders' joinery and carpentry (n.e.s.), was mostly exported to developed countries such as Germany, USA, and the Netherlands. The other major markets were France, Denmark, and China. In 1998, its export value to Germany accounted for USD 72,6 mill. and its contribution to total value of world's "other BJC" imports accounted for 2.50%. Indo export values to USA and the Netherlands accounted for USD 36,8 mill. and USD 31,0 mill. in 1998. Its contribution to total value of world "other BJC" import constituted some 1.26% for USA and 1.07% for the Netherlands. In Germany Indonesian deliveries reached a 10.65% role. In the USA and the Netherlands Indo products took 5.46% and 24.80% of all imports, respectively. Germany was the most important market for Indonesia with 34.6% of its deliveries taken, and 3.80% share captured in total export value of secondary wood products from Indonesia. USA and the Netherlands accounted for 17.5% and 14.8%, and played a more modest role in the value of secondary wood products exported by Indonesia (1.92% and 1.62%). (Table 4.12)

Indonesian "other BJC" exports to Germany, USA, and the Netherlands went into to decrease by 2002. Its export value to Germany decreased up to USD 34,3 mill. and its contribution to total value of world imports decreased to 1.05% from 2.50% in 1998. Its export values to USA and the Netherlands decreased to USD 35,4 mill. and USD 18,0 mill. respectively.

Table 4.12 Indonesian exports of "other" builders wood (not elsewhere specified) to major international markets

Major International Markets	Value 1000 US$	% of total export value of builders wood n.e.s.	% of total export value of secondary wood products	% of total import value of builders wood n.e.s. of importing country	% of total world import value of builders wood n.e.s.
Germany					
1998	72,633	34.6	3.80	10.65	2.50
1999	64,449	32.6	3.02	9.87	1.90
2000	66,811	29.5	2.89	11.70	1.99
2001	26,754	18.3	1.29	5.88	0.84
2002	34,295	23.8	1.72	7.59	1.05
USA					
1998	36,790	17.5	1.92	5.46	1.26
1999	37,315	18.9	1.75	3.85	1.10
2000	55,779	24.6	2.41	6.31	1.67
2001	37,855	25.9	1.82	4.42	1.19
2002	35,347	24.6	1.77	3.71	1.08
Netherlands					
1998	30,999	14.8	1.62	24.80	1.07
1999	17,755	9.0	0.83	15.35	0.52
2000	22,096	9.8	0.95	21.85	0.66
2001	18,605	12.7	0.89	19.78	0.58
2002	18,014	12.5	0.90	21.63	0.55
France					
1998	3,535	1.7	0.18	3.38	0.12
1999	6,580	3.3	0.31	5.21	0.19
2000	10,948	4.8	0.47	7.43	0.33
2001	9,771	6.7	0.47	6.91	0.31
2002	7,947	5.5	0.40	5.95	0.24

Source: COMTRADE, 2003 (data processed)

4.2.3 Wood carvings

Indonesian wood carvings were mainly exported to USA, the UK and France. The other major client countries were Germany, Japan, Netherlands and Italy (Table 4.13). In 1998, its export value to USA accounted for USD 18,5 mill., which was a meager 1.99% of the world trade in carvings. Exports to UK and France were USD 7,7 mill. and USD 6,3 mill. Indonesia delivered 4.86% of US imports of wood carvings, and 14.01% in the UK and 11.55% in France. US market took 29.3% of Indo exports, or 0.97% of total export value of secondary wood products by Indonesia. In the UK and France, Indonesian carvings accounted for 12.1% and 9.9% of imports, respectively.

Indonesian carvings exports to USA remained relatively stable but to UK and France they went into a decline. In 2002, its export value to USA was relatively stable to account for about USD 18,5 mill., with its contribution to total value of world carvings import decreasing slightly. Indo export values to UK and France went down to USD 5,3 mill. and USD 5,9 mill. in 2002.

Table 4.13 Indonesian exports of wood carvings to major international markets

Major Internatio-nal Markets	Value 1000 US$	% of total export value of wood carvings	% of total export value of secondary wood products	% of total import value of wood carvings of importing country	% of total world import value of wood carvings
USA					
1998	18,541	29.3	0.97	4.86	1.99
1999	22,158	31.5	1.04	4.95	2.17
2000	22,978	34.0	0.99	4.33	2.05
2001	20,699	31.8	0.99	3.91	1.88
2002	18,505	30.8	0.93	3.30	1.62
UK					
1998	7,677	12.1	0.40	14.01	0.82
1999	5,092	7.2	0.24	8.86	0.50
2000	5,367	7.9	0.23	9.45	0.48
2001	8,122	12.5	0.39	13.33	0.74
2002	5,309	8.8	0.27	8.57	0.46
France					
1998	6,292	9.9	0.33	11.55	0.68
1999	6,883	9.8	0.32	10.32	0.67
2000	7,033	10.4	0.30	10.10	0.63
2001	4,409	6.8	0.21	6.48	0.40
2002	5,923	9.9	0.30	8.19	0.52
Germany					
1998	6,179	9.8	0.32	5.74	0.66
1999	6,320	9.0	0.30	6.68	0.62
2000	4,603	6.8	0.20	5.17	0.41
2001	4,283	6.6	0.21	5.67	0.39
2002	3,698	6.2	0.18	4.74	0.32
Japan					
1998	5,129	8.1	0.27	7.32	0.55
1999	5,748	8.2	0.27	8.09	0.56
2000	4,468	6.6	0.19	5.69	0.40
2001	4,409	6.8	0.21	5.69	0.40
2002	4,293	7.1	0.21	5.42	0.38

Source: COMTRADE, 2003 (data processed)

4.2.4 Wooden picture frames

Indonesian wooden picture frames (WPF) were foremost exported to USA and Japan (Table 4.14). In 1998, its export value to USA accounted for USD 14,1 mill., which corresponded to 2.44% to total value of world WPF imports. Indo exports to Japan accounted for USD 8,6 mill., which was 1.5% of world trade. In USA Indonesia reached a 4.75% market share in imports. In Japan its market share was considerably higher at 26.43%. Indonesia exported 51.0% of its WPF to the USA. Trade represented merely 0.73% of its total exports in secondary processed wood products. Exports to Japan accounted for 31.3% of Indo exports in WPF: this in turn was 0.45% Indo exports in all the secondary wood products. Indonesian WPF exports to USA and Japan increased, but inconsistently.

Table 4.14 Indonesian exports of wooden pict. frames to major int'l markets

Major International Markets	Value 1000 US$	% of total export value of wood picture frames	% of total export value of secondary wood products	% of total import value of wood picture frames of importing country	% of total world import value of wood picture frames
USA					
1998	14,059	51.0	0.73	4.75	2.44
1999	16,358	45.7	0.77	4.89	2.50
2000	16,902	42.4	0.73	4.79	2.50
2001	19,366	48.2	0.93	5.30	2.84
2002	22,268	51.7	1.11	5.22	3.13
Japan					
1998	8,629	31.3	0.45	26.43	1.50
1999	10,871	30.4	0.51	30.23	1.66
2000	14,693	36.8	0.63	33.28	2.17
2001	14,961	37.2	0.72	35.62	2.19
2002	13,967	32.5	0.70	33.25	1.96
UK					
1998	843	3.1	0.04	3.12	0.15
1999	3,674	10.3	0.17	11.82	0.56
2000	3,327	8.3	0.14	10.64	0.49
2001	1,139	2.8	0.05	3.86	0.17
2002	1,856	4.3	0.09	5.91	0.26
Australia					
1998	912	3.3	0.05	7.62	0.16
1999	1,692	4.7	0.08	14.71	0.26
2000	1,995	5.0	0.09	16.67	0.29
2001	1,947	4.8	0.09	19.36	0.29
2002	1,709	4.0	0.09	18.10	0.24

Source: COMTRADE, 2003 (data processed)

4.2.5 Wooden tableware and kitchenware

Indonesian wooden tableware and kitchenware (WTK) found good demand in Japan and USA. The other major importing countries were Germany, Denmark, France, and the UK (Table 4.15). Nevertheless, the exports were small in size compared to other product groups, so merely a cursory review is warranted here. In 1998, its export value to Japan accounted for USD 5,0 mill. and its contribution to total value of world WTK import accounted for 1.11%. Its export values to USA and Korea accounted for USD 2,1 mill. and USD 0,7 mill., respectively.

Table 4.15 Indonesian exports of wooden tableware and kitchenware to major international markets

Major International Markets	Value 1000 US$	% of total export value of wood table & kitchen ware	% of total export value of secondary wood products	% of total import value of wood table & kitchen ware of importing country	% of total world import value of wood table & kitchen ware
Japan					
1998	5,001	52.5	0.26	3.22	1.11
1999	4,864	50.9	0.23	3.02	1.04
2000	4,207	40.2	0.18	2.49	0.84
2001	3,268	39.9	0.16	1.94	0.65
2002	2,259	40.0	0.11	1.24	0.43
USA					
1998	2,124	22.3	0.11	2.46	0.47
1999	1,214	12.7	0.06	1.32	0.26
2000	1,308	12.5	0.06	1.28	0.26
2001	1,228	15.0	0.06	1.25	0.24
2002	997	17.6	0.05	1.00	0.19
Korea Rep					
1998	665	7.0	0.03	6.65	0.15
1999	565	5.9	0.03	4.52	0.12
2000	467	4.5	0.02	3.04	0.09
2001	341	4.2	0.02	2.01	0.07
2002	327	5.8	0.02	1.52	0.06
Germany					
1998	484	5.1	0.03	1.40	0.11
1999	312	3.3	0.01	0.93	0.07
2000	304	2.9	0.01	1.01	0.06
2001	290	3.5	0.01	0.99	0.06
2002	164	2.9	0.01	0.58	0.03

Source: COMTRADE, 2003 (data processed)

4.2.6 Wooden furniture

4.2.6.1 Overview

According to ASMINDO data, Indonesia's wooden furniture exports amounted to USD 1,116 billion in 2002 (Table 4.16). Export value was up by 7.7% from 2001, when exports amounted to USD 1,037 billion.

Table 4.16 Exports of all types of wooden furniture by countries in 2002

			Country shares	
Countries	**ton**	**Mill. USD FOB**	**ton**	**USD FOB**
USA	133,387	407,763	21.3	36.5
Japan	76,576	118,262	12.2	10.6
Netherlands	39,093	70,862	6.2	6.3
France	37,428	63,525	6.0	5.7
UK	26,896	58,359	4.3	5.2
Belgium	22,101	50,285	3.5	4.5
Germany	21,433	43,714	3.4	3.9
Australia	27,779	42,171	4.4	3.8
Spain	19,206	34,525	3.1	3.1
Italy	16,357	25,051	2.6	2.2
Other	205,618	201,975	32.9	18.1
Total	**625,874**	**1116492**	**94.0**	**94.3**

Source: ASMINDO, 2003

Wood is by far the biggest material used for making export furniture in Indonesia. Wooden furniture accounted for 75.7% of all furniture export value in 2002, well ahead of rattan (20.5%) and bamboo (0.4%). Other materials made up just 3.4% of exports.

4.2.6.2 Seats of bamboo, rattan, etc.

Indonesian seats of bamboo, rattan, etc. (SBR) were for most part exported to the Netherlands, Germany and Japan. The other major importing countries were USA, the UK, France, and Spain (Table 4.17). In 1998, its export value to the Netherlands accounted for USD 38,3 mill., which contributed some 10.65% to total value of world SBR import. Exports to Germany and Japan amounted to USD 33,6 mill. and USD 23,4 mill., which contributed to total value of world SBR import some 9.37% and 6.53%, respectively.

Indonesia held very high market shares in most markets. In Netherlands 86.62% of SBR were delivered by Indonesia, and 59.94% in Germany and 83.82% in Japan. The Netherlands took

21.2% of Indo exports in SBR, which equaled to 2.00% of total export value of secondary wood products by Indonesia. 18.6% and 13.0% of Indo exports went to Germany and Japan.

4.2.6.3 Seats with wooden frames

Indonesian seats with wooden frames (SWF) were mostly exported to the USA, and to a lesser degree to Germany and the Netherlands. Smaller importing countries were France, Japan, UK and Denmark (Table 4.18). In 1998, its export value to USA accounted for USD 63,7 mill. and its contribution to total value of world SWF import was 1.10%. Exports to Germany and the Netherlands reached USD 29,7 mill. and USD 22,2 mill. USA was key market for Indonesia, taking 27.8% of Indo exports in SWF, which constituted some 3.33% of total export value of secondary wood products from Indonesia. Germany and the Netherlands purchased 13.0% and 9.7% of all Indo SWF.

Indonesian SWF exports to USA and Germany increased but those to the Netherlands declined over time. In 2002, its export value to USA accounted for USD 109,3 mill., and its contribution to total value of world SWF import increased up to 1.49% from 1.10% in 1998. Its export value to Germany increased up to USD 34,3 mill. but to the Netherlands fell down to USD 17,9 mill.

Table 4.17 Indonesian export of bamboo etc. seats/chairs to major international markets, 1998-2002

Major International Markets	Value 1000 US$	% of total export value of bamboo/etc seats/chairs	% of total export value of secondary wood products	% of total import value of bamboo/etc seats/chairs of importing country	% of total world import value of bamboo/etc seats/chairs
Netherlands					
1998	38,249	21.2	2.00	86.62	10.65
1999	37,744	20.8	1.77	89.78	10.08
2000	29,546	16.4	1.28	86.41	7.53
2001	27,323	15.8	1.31	88.89	7.59
2002	21,223	12.6	1.06	83.81	6.03
Germany					
1998	33,637	18.6	1.76	59.94	9.37
1999	32,858	18.1	1.54	59.40	8.77
2000	31,955	17.8	1.38	65.94	8.15
2001	27,773	16.1	1.33	61.85	7.72
2002	26,219	15.5	1.31	59.66	7.45
Japan					
1998	23,440	13.0	1.22	83.82	6.53
1999	22,627	12.4	1.06	85.85	6.04
2000	22,388	12.5	0.97	85.56	5.71
2001	20,021	11.6	0.96	84.87	5.56
2002	21,713	12.8	1.09	87.07	6.17
USA					
1998	17,972	10.0	0.94	19.25	5.00
1999	18,654	10.3	0.87	17.33	4.98
2000	24,315	13.5	1.05	18.83	6.20
2001	27,107	15.7	1.30	23.37	7.53
2002	29,369	17.4	1.47	24.82	8.35
UK					
1998	11,164	6.2	0.58	46.87	3.11
1999	11,403	6.3	0.53	48.05	3.05
2000	12,519	7.0	0.54	48.25	3.19
2001	13,323	7.7	0.64	50.37	3.70
2002	14,495	8.6	0.72	53.05	4.12
France					
1998	8,448	4.7	0.44	40.39	2.35
1999	8,723	4.8	0.41	39.27	2.33
2000	9,857	5.5	0.43	37.13	2.51
2001	10,121	5.9	0.49	42.83	2.81
2002	11,126	6.6	0.56	47.95	3.16

Source: COMTRADE, 2003 (data processed)

Table 4.18 Indonesian export of seats with wooden frames to major international markets

Major International Markets	Value 1000 US$	% of total export value of seats with wooden frames	% of total export value of secondary wood products	% of total import value of seats with wooden frames of importing country	% of total world import value of seats with wooden frames
USA					
1998	63,684	27.8	3.33	4.16	1.10
1999	90,730	30.8	4.24	4.87	1.43
2000	107,147	33.0	4.63	4.84	1.59
2001	110,139	36.2	5.29	5.13	1.60
2002	109,265	40.9	5.46	4.30	1.49
Germany					
1998	29,653	13.0	1.55	2.97	0.51
1999	42,483	14.4	1.99	4.24	0.67
2000	46,069	14.2	1.99	4.94	0.68
2001	43,431	14.3	2.09	4.31	0.63
2002	34,259	12.8	1.71	3.40	0.47
Netherlands					
1998	22,221	9.7	1.16	10.45	0.38
1999	20,539	7.0	0.96	8.00	0.32
2000	31,327	9.7	1.35	12.29	0.46
2001	18,880	6.2	0.91	7.27	0.27
2002	17,924	6.7	0.90	6.80	0.24
France					
1998	16,145	7.1	0.84	3.11	0.28
1999	21,462	7.3	1.00	4.02	0.34
2000	24,169	7.5	1.04	4.83	0.36
2001	24,387	8.0	1.17	4.95	0.35
2002	24,070	9.0	1.20	4.35	0.33
Japan					
1998	16,111	7.0	0.84	4.33	0.28
1999	17,447	5.9	0.82	4.28	0.27
2000	16,945	5.2	0.73	3.57	0.25
2001	15,458	5.1	0.74	3.30	0.22
2002	11,863	4.4	0.59	2.87	0.16
UK					
1998	13,061	5.7	0.68	3.35	0.23
1999	12,077	4.1	0.57	2.75	0.19
2000	13,216	4.1	0.57	2.69	0.20
2001	9,267	3.0	0.45	1.65	0.13
2002	11,420	4.3	0.57	1.70	0.16

Source: COMTRADE, 2003 (data processed)

4.2.6.4 Wooden bedroom furniture

Indonesian wooden bedroom furniture (WBF) was mostly exported to two markets: USA and Japan (Table 4.19). In 1998, its export value to USA accounted for USD 77,6 mill., which contributed 2.57% to total value of world WBF import. Its exports to Japan was much less (USD 37,7 mill.) and contributed some 1.18% to the total value of world WBF import. In USA imports, Indonesian WBF held a 8.21% share. Its role was much bigger in Japan (48.42% of all imports of WBF). USA took 60.20% of all Indo exports, or 4.06% of total export value of secondary wood products by Indonesia. Japan bought 27.70% of all Indo WBF, or 1.86% of its total export value of secondary wood products.

Table 4.19 Indonesian exports of wooden bedroom furniture to major international markets

Major International Markets	Value 1000 US$	% of total export value of wooden bedroom furniture	% of total export value of secondary wood products	% of total import value of wooden bedroom furniture of importing country	% of total world import value of wooden bedroom furniture
USA					
1998	77,647	60.20	4.06	8.21	2.57
1999	115,922	65.70	5.42	8.93	3.43
2000	130,863	70.90	5.65	7.76	3.52
2001	130,477	71.40	6.27	7.09	3.39
2002	151,785	75.80	7.59	6.55	3.48
Japan					
1998	35,655	27.70	1.86	48.42	1.18
1999	39,174	22.20	1.83	45.84	1.16
2000	33,121	17.90	1.43	32.71	0.89
2001	34,848	19.10	1.67	29.31	0.91
2002	25,319	12.60	1.27	21.50	0.58

Source: COMTRADE, 2003 (data processed)

Indonesian WBF exports to USA tended to increase but Japan tended to decrease. In 2002, its export value to USA went up to USD 151,8 mill. However, its export value to Japan decreased to USD 25,3 mill.

4.2.6.5 "Other" furniture

Indonesian "other" wooden furniture (OWF) was predominantly exported to the USA, Japan and the Netherlands. The other major importing countries were the UK, France, Germany, and Spain (Table 4.20). In 1998, Indonesia's exports to the USA were USD 151,6 mill. and its

contribution to total value of world OWF import accounted for 1.71%. Its exports to Japan and the Netherlands accounted for USD 52,9 mill. and USD 48,8 mill., respectively. In the total USA imports of OWF, Indonesia had a 6.05% share. In Japan and the Netherlands, Indonesia had 9.50% and 13.84% shares, respectively. USA took 31.0% of Indonesia's total exports in OWF, equal to 7.92% of all Indo exports of secondary wood products. Exports to Japan and the Netherlands made up 10.8% and 10.0% of all Indo exports.

Indonesian OWF exports to USA, Japan and the Netherlands tended to increase. In 2002, its export value to USA reached USD 246,7 mill. and its contribution to total value of world OWF import increased up to 2.16% from 1.71% in 1998. Its export values to Japan and the Netherlands increased up to USD 82,8 mill. and USD 58,4 mill. by 2002.

4.2.6.6 Furniture parts

Indonesian furniture parts (FUP) represented a smaller part of trade. Exports went to Japan and the USA, both taking one third of Indonesia's deliveries. The other much smaller importer countries were the UK Germany (Table 4.21). In 1998, its export value to Japan accounted for USD 27,4 mill. and its contribution to total value of world FUP import accounted for 0.71%. Indo exports to USA accounted for USD 24,5 mill.

Table 4.20 Indonesian exports of "other" wooden furniture to major international markets

Major International Markets	Value 1000 US$	% of total export value of wood furniture	% of total export value of secondary wood products	% of total import value of wood furniture of importing country	% of total world import value of wood furniture
USA					
1998	151,610	31.00	7.92	6.05	1.71
1999	197,563	32.60	9.24	6.45	2.02
2000	228,811	33.40	9.88	6.26	2.18
2001	236,800	35.10	11.38	6.49	2.24
2002	246,653	36.40	12.34	5.66	2.16
Japan					
1998	52,932	10.80	2.77	9.50	0.60
1999	69,784	11.50	3.26	10.90	0.71
2000	82,457	12.00	3.56	9.61	0.78
2001	83,928	12.40	4.03	9.50	0.80
2002	82,783	12.20	4.14	9.36	0.72
Netherlands					
1998	48,785	10.00	2.55	13.84	0.55
1999	57,246	9.50	2.68	14.97	0.59
2000	60,398	8.80	2.61	15.87	0.57
2001	57,068	8.40	2.74	15.13	0.54
2002	58,430	8.60	2.92	14.38	0.51
UK					
1998	47,964	9.80	2.51	8.65	0.54
1999	42,324	7.00	1.98	6.50	0.43
2000	42,910	6.30	1.85	5.63	0.41
2001	50,313	7.40	2.42	5.97	0.48
2002	49,311	7.30	2.47	4.81	0.43
France					
1998	35,715	7.30	1.87	5.02	0.40
1999	44,308	7.30	2.07	5.77	0.45
2000	54,091	7.90	2.34	6.97	0.51
2001	49,465	7.30	2.38	6.69	0.47
2002	54,799	8.10	2.74	6.79	0.48
Germany					
1998	27,446	5.60	1.43	1.88	0.31
1999	30,180	5.00	1.41	2.22	0.31
2000	32,184	4.69	1.39	2.76	0.31
2001	29,236	4.33	1.41	2.49	0.28
2002	27,230	4.02	1.36	2.44	0.24
Spain					
1998	15,449	3.16	0.81	11.85	0.17
1999	29,838	4.93	1.40	17.28	0.31
2000	35,016	5.10	1.51	20.06	0.33
2001	34,693	5.10	1.67	18.22	0.33
2002	40,303	6.00	2.02	17.26	0.35

Source: COMTRADE, 2003 (data processed)

Table 4.21 Indonesian exports of furniture parts to major international markets

Major International Markets	Value 1000 US$	% of total export value of furniture parts	% of total export value of secondary wood products	% of total import value of furniture parts of importing country	% of total world import value of furniture parts
Japan					
1998	27,350	37.70	1.43	12.30	0.71
1999	25,778	34.90	1.21	10.79	0.62
2000	26,761	33.90	1.16	8.89	0.60
2001	26,615	38.20	1.28	9.15	0.61
2002	25,983	38.20	1.30	8.97	0.56
USA					
1998	24,456	33.70	1.28	2.96	0.64
1999	25,607	34.70	1.20	2.42	0.62
2000	27,877	35.30	1.20	2.12	0.62
2001	19,575	28.10	0.94	1.60	0.45
2002	23,147	34.00	1.16	1.67	0.50
Germany					
1998	4,504	6.20	0.24	0.66	0.12
1999	5,827	7.90	0.27	0.84	0.14
2000	4,557	5.80	0.20	0.69	0.10
2001	3,999	5.70	0.19	0.63	0.09
2002	3,240	4.76	0.16	0.52	0.07
UK					
1998	3,233	4.46	0.17	0.89	0.08
1999	3,255	4.41	0.15	0.96	0.08
2000	4,556	5.80	0.20	1.32	0.10
2001	5,589	8.00	0.27	1.59	0.13
2002	3,989	5.90	0.20	0.81	0.09

Source: COMTRADE, 2003 (data processed)

5 COMPARATIVE COST ADVANTAGES AND OTHER COMPETITIVENESS FACTORS OF INDONESIAN WOOD PRODUCTS

5.1 Introduction

5.1.1 Defining comparative and competitive advantage

In the common discussion, the comparative and competitive advantages are often mixed or used as synonyms to describe simply the competitive position between suppliers in terms of market shares, production costs or prices. **National competitiveness** has been put in the spotlight, and the ITTO appears to have adopted it as well. In common parlance, a nation's competitiveness has been used to cover almost any aspect of market performance (such as market share development). In fact, this is a misleading measure, because nations *per se* do not compete in the marketplace! It is the companies-firms that are competing, so the competitiveness is essentially a firm-level concept (Asian Development Outlook, 2003). For the benefit of this project, these commonly misused terms should be well understood.

Comparative advantage refers to a superior position obtained from lower production factor costs (labor, raw materials, capital or infrastructure) or economies-of-scale. But it no longer automatically confers competitive advantage in most industries. In this era of globalization, companies can gain access to an optimal blend of inexpensive production factors, or can relocate their factories into regions that offer favorable conditions and costs. The **competitive advantage** therefore arises rather from superior productivity in using production inputs for innovative high-value products, than only from the availability of low-cost inputs or the sheer size of the company (ITC & ITTO, 2002).

Lower costs of raw material and manpower are not anymore sufficient to guarantee the long-term competitiveness of wood producers in export markets. In the truly global marketplace, it is becoming increasingly difficult to achieve and maintain "lowest-cost" producer status. Reasons for this are:

1. The globalization of cost-based competition, where new lower-cost production bases are continuously being sought for by multinational forest corporations;
2. World-wide outsourcing of intermediate wood products and components for furniture;

3. The emergence of fast-growth plantation forestry and its integrated processing into multiple products in several tropical regions at the same time;
4. Innovations in material sciences and their translation into new differentiated products, calling for less wood and allowing the use of lower quality timber;
5. Consolidation of the largest distribution channels and their stronger purchasing power in global procurement.

Exogenous factors, such as exchange rate fluctuations, low wages or interest rates, cannot maintain competitiveness in the long term. These advantages will be invariably eroded over time in the rise of new competitors.

The areas that possess factor cost advantages on wood, labor, and energy, and enjoy political stability plus enabling economic environment, have little difficulty in attracting investment capital, the latest technology and even the ex-patriate human skills. Some investors, however, originate from environmentally sensitive markets, and hold therefore a more guarded posture for investing in tropical natural wood processing, unless their environmental risk is averted by certification. (ITC & FAO, 2002)

One can therefore argue that countries like Indonesia should consider abandoning their chosen specialisation in international trade on the basis of primary resource endowment (labour, raw material, capital) – as this reflects a static approach, which has yielded bad long-term imbalancies. Instead, it should accept competitive advantage as a dynamic concept relating to **the set of institutions and economic policies supportive of sufficient rate of economic growth**. The root wisdom is that **national prosperity is created, not inherited**.

There are three transitions to be made: (i) from traditional specialization to factor-driven competitiveness, (ii) from previous to investment-driven competitiveness, and finally, to (iii) innovation-driven competitiveness. All transitions are demanding and call for a careful policy backing in order to materialize. The process will be pitiless to inefficient producers, which will fall under on the way. But this type of evolution can only be warranted because it increases value addition on the finite wood resource being put to use.

The division of labor and sharing of responsibility should be clearly demarcated between the government and the private sector (wood industry). Firms that make the wood products will

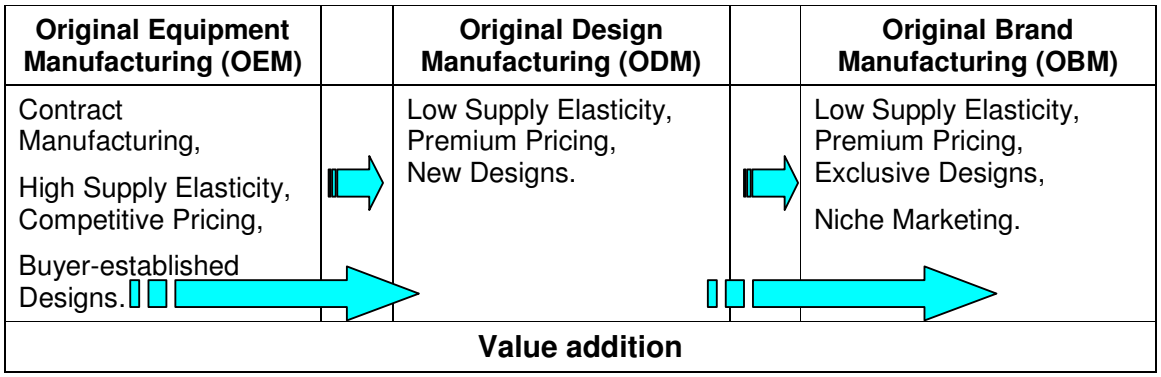
have to be held responsible for continuously learning how to meet customer needs and deliver to markets better, make business more profitably, and so enhance their overall capabilities to survive in the business. **Government's role is more subtle: it should create the right framework conditions under which the private sector can feel it can operate on a level playing field, and plan for the future amidst a stable macroeconomic, legal and institutional set-up.** Physical infrastructure, education and technology transfer issues warrant a facilitating role by the government. In Indonesia's case, it would appear that these roles are sometimes loaded with false expectations and skewed responsibilities, leading time to time into micro-management of productive sectors by the government.

5.1.2 Enhancing competitiveness through changes in manufacturing strategies

When assessing a country's (or industry's) competitiveness one should take in to account several factors such as cost and quality of raw materials, cost and availability of capital, production cost structures (efficiency), labor skill level and productivity, quality & design of products and their finishing, supporting services, etc.

If one compares different stages of seeking competitiveness through enhancing value addition between Europe and Asia, the following can be observed. In Europe, branded, flexible but efficient production with the highest technological quality, design, innovative market promotion, and swift distribution with minimal stock-keeping is the key concept for wood-working industry. In Asia, the industry is basically moving on by clinching to the favourable "old" factors of competitiveness (raw material, labour, written-off machinery, etc.). Contract manufacturing for foreign buyers and distributors has promoted so called original equipment manufacturing (OEM, with no product development ambitions) in product sectors where appropriate technology, and training to operate it has been acquired. Move towards original design manufacturing (ODM) and ultimately to original brand manufacturing (OBM), appear to be distant goals for Asian producers in most cases. According to Ratnasingam/IFRG (2002), 77% of South-East Asian furniture industries were following the ODM path, while only 17% and 6% were considered to have reached the ODM and OBM stages, respectively. These stages are further elaborated in Figure 5.1.

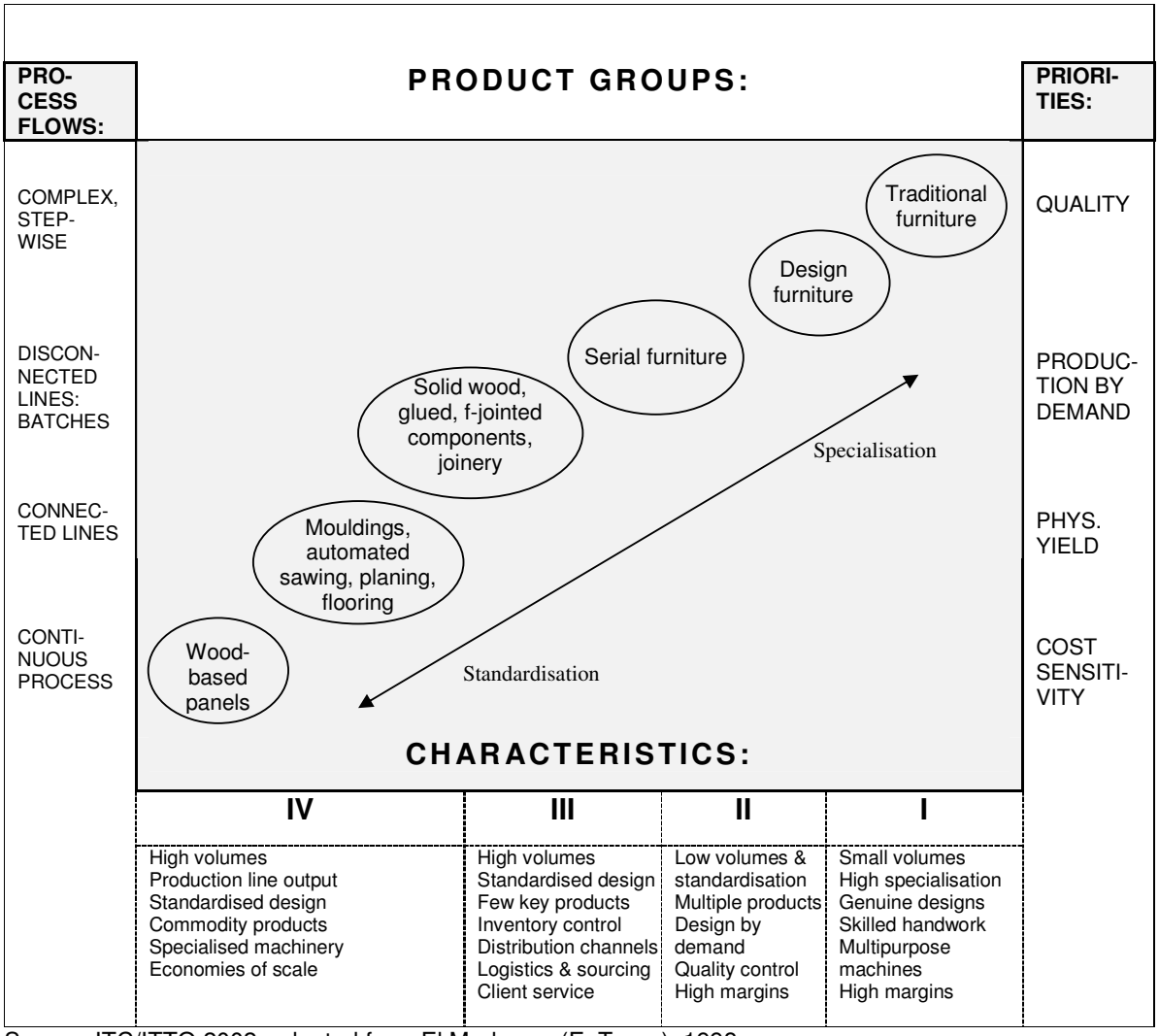
Figure 5.1 Stages of developing competitiveness through value addition in South-East Asia's furniture industry



Source: Ratnasingam/IFRG, 2002

The first and the most obvious hurdle for many tropical producers is the fact that their products are not fit, nor competitive for the big export markets, which have their large-scale producers and established quality requirements for mainstream products. This leaves the developing countries with three basic options: (1) improve their products and expand volumes in order to compete in the mass markets, (2) create new products and markets for moving up in the value chain, or (3) concentrate on low-volume/high value products in highly specific niche markets. Of course, in reality these strategies can be developed in parallel across the wood-processing segments. The following Figure 5.2 gives characteristics of different manufacturing strategies chosen between mass production and specialized niche carving.

Figure 5.2 Evolution of manufacturing strategies for further processors of wood



Source: ITC/ITTO 2002, adapted from El Maderero (E. Teran), 1998

There are at least four broad drivers of competitiveness that reveal themselves both on a theoretical front and in the reality of the practitioners of wood sector business. These are 1) globalization, 2) technology and competition in terms of 3) substitution and 4) pricing of products. Implications of these drivers are discussed in the following sections of this chapter.

5.1.3 Drivers of competitiveness

Most South-East Asian exporters of wood products, Indonesia included, depend for their competitiveness mainly on the availability of low-cost production factors. The availability of good-quality raw materials and a large pool of cheap labor have indulged the industries to

continue the chosen path without much of adaptation. In the best of cases in the region, indigenous designs and crafting skills are unique (furniture/home decoration). Low transportation and energy costs, and currency depreciation have been contributing factors, but they tend to be eroded over time. For example, low productivity of local manpower, poor raw material recovery rate or high freight or terminal handling costs can effectively cancel out some the initial comparative advantages. Indonesia can be safely said to have suffered from every one of these aspects (ITC/ITTO, 2002).

Raw material endowment remains a sustainable driver for future competitiveness only if the resource replenishment is safeguarded in a country. This is not anymore the case for Indonesia. The lack of sustainable forest management and "timber mining" for the past half a century has pushed forest degradation to such a scale that the old parameters of competitive industry are definitely lost. Industry therefore needs to adjust itself and try finding new ingredients for its competitiveness if it wants to survive beyond the point of total resource exhaustion.

Mixed materials use has already been well developed by the furniture industries in the Philippines, for example. Combined with enhanced design capabilities, the chosen strategy relieves the difficulty of obtaining wood under scarcity conditions. Labor productivity and innovation are key issues in trying to improve the competitiveness of wood processing for exports, strengthened by more efficient technology (such as small-diameter or spindle-less lathes for plywood).

There is a closer physical and economic link between primary processing (saw milling and veneer or plywood production) and forest management, than between primary and further processing owing to the bulky nature and low value of wood raw material. Semi-finished products such as green sawn lumber or ordinary plywood can be efficiently transported over long distances and further processed at a greater distance from the forest, usually in and around cities. **The comparative advantage derived purely from resource endowment, therefore, declines as the degree of processing increases. The economies of scale tend to behave similarly, i.e. the higher the degree of processing, the less the dependence on plant size as a factor of cost competitiveness.** But this conclusion has notable exceptions, e.g. small-scale saw milling can remain competitive in suitable set of conditions (ITC &

ITTO, 2002). But it appears to hold true that SMEs can most likely survive in value-added wood segments, rather than in primary processing, where economy-of-scale is a crucial element for competitiveness.

It is concluded that comparative advantages derived from cheap production parameters can quickly be lost to other emerging nations, who use their production factors in a more productive manner. This has been clearly exemplified by the threat posed by China and Vietnam to Indonesia´s wood product exports. For all the reasons cited above, Indonesia would ideally have to base its competitiveness on value-added products, and on the following factors:

- flexible costing of local inputs (notably wood and labor);
- consistently improving total productivity (measured over all factors of production i.e. wood, labor, capital, energy and operating supplies);
- augmented quality of products (including design);
- credibility & responsibility: raw materials certified as both legal and sustainable.

5.2 Characteristics of Indonesia's wood industry: factors of competitiveness

5.2.1 Industry structure

Indonesian Sawmillers' and Woodworking Manufacturers' Association (ISWA) provided the following structure of the builder's joinery and carpentry industries (ITC & ITTO, 2002):

The Indonesian wooden furniture sector is characterized by SMEs, and the early creation of furniture districts with genuine designs and crafting skills such found as in Jepara, Bali and Central Java. The typical size among Central Java's SME furniture factories is with 50-500 employees and maximum USD 500,000 annual turnover. Majority of the companies are still Indonesian-owned, but the number of foreign joint ventures has been reported increasing. The design trends have been adopted to meet the international demands and facilitate faster and longer production run. In practice, this means moving away from the highly ornamental, hand-carved traditional designs onto "Westernized" straight-line forms. Local firms also increasingly hire foreign freelance designers to capture the market tastes better than before. A Java Design Center was in the stages of establishment in 2002. (Furniture-Indonesia.com)

Table 5.1 Structure of Mouldings and Joinery Industry in Indonesia (2000)

	Total annual output			Wood consumption		
Product	**USD mill./yr**	**No. of firms**	**Share of output%**	**m^3/yr**	**No. of firms**	**Share of output%**
Mouldings	Small < 0.5	180	18	Small < 500	170	23
	Med. 0.5-2	31	35	Med. 500-2.000	38	26
	Large > 2.0	10	47	Large > 2.000	13	51
			100			**100**
Flooring	Small < 0.5	158	15	Small < 500	151	13
	Med. 0.5-2	46	28	Med. 500-2.000	47	21
	Large > 2.0	19	57	Large > 2.000	25	66
			100			**100**
Doors	Small < 0.5	35	6	Small < 500	34	9
	Med. 0.5-2	18	25	Med. 500-2.000	22	26
	Large > 2.0	13	69	Large > 2.000	10	65
			100			**100**
Windows	Small < 0.5	119	34	Small < 500	111	25
	Med. 0.5-2	17	47	Med. 500-2.000	22	44
	Large > 2.0	3	19	Large > 2.000	6	31
			100			**100**

Source: ISWA: in ITC & ITTO, 2002)

ASMINDO has also tackled the challenge of upgrading and mechanizing some of the production facilities. The possibilities to launch locally-made furniture-making machinery have been studied, with a target to put affordable (USD 10,000-20,000) furniture-making basic machinery into offering.

With a large direct and indirect workforce, the entire value-added woodworking sector serves as an important socio-economic factor in the national economy. Unfortunately, the woodworking sector is losing out in popularity for other sectors, and therefore fails to attract dedicated workforce. This results in a low retention and skills accumulation. The inherently low entry barrier coupled with the extensive use of (skilled) foreign workers in the industry may make the workforce characteristically mobile. Under such circumstances, labor productivity tends to stagnate. Furniture industry remains essentially a low-wage economy, which is not attractive to the more stable local workforce. (Ratnasingam, 2002)

5.2.2 Labor productivity

Labor productivity is expressed in terms of the value addition per employee per annum in US-dollars (Table 4.2). In this context, when compared to their counterparts in Italy, the largest exporter of wooden furniture in the world, labor productivity recorded for the wooden

furniture industries in the major South-East Asian countries appear rather low. The Indonesian productivity levels were 29.5% of the Italian rate. Taiwan is in top class of labor productivity.

Table 5.2 Labor productivity in furniture industries of South-East Asia (2000)

Country	Daily Wage Rate (USD/day)	Labor Productivity (USD/employee/yr.)
China	1,50	29,000
Malaysia	7,00	31,000
Indonesia	3,00	28,000
Thailand	3,00	27,000
Philippines	5,00	23,000
Italy	50,00	95,000
Taiwan	55,00	105,000
Denmark	48,00	93,000
Germany	45,00	87,000

Source: Ratnasingam: in ITC & ITTO, 2002

The plentiful availability of the Chinese labor force, and the **labor productivity growing faster than wages**, are the key factors keeping the country competitive in basic manufacturing industries like furniture and wood-working.

An example below indicates that lower costs of raw materials and labor are not sufficient factors on their own to guarantee the competitiveness of further processed wood products made in a tropical developing country in export markets. These are just two of the parameters in what is, in practice, a complex equation. The lower productivity of local manpower (often using five to eight times more hours), poor raw material recovery rates and high freight costs, all play their part in canceling out the initial advantages.

Table 5.3 Comparative cost structures in furniture production

Cost Factor	Company in a Developed Country		Company in a Tropical Producer Country	
Labor	5 hours à US$ 6,00	30,00	20 hours à US$ 0,80	16,00
Raw Material	14 b.ft à US$ 1,50	21,00	18 b.ft à US$ 0,90	16,20
Overheads	5 hours à US$ 6,00	30,00	20 hours à US$ 1,80	36,00
Total Cost		81,00		68,20
Selling Price		100,00		75,00
Profit		**19,00**		**6,80**

Source: Desclos: in ITC & ITTO, 2002

5.2.3 Technology upgrading: a panacea for profits?

Modern machinery and the related know-how are essential for producing according to international commercial and industrial standards. Exporting and further processing means accepting tighter, more complex specifications and quality control requirements set by the clients. This usually cannot be achieved without modern production lines. Imported machinery and equipment are costly by any tropical country standards, and expenses of shipping, installing and maintaining them in remote sites adds up to the financial burden. Often the only way to stay in business – with or without profit - is to run the equipment at maximum capacity, no matter what the market situation looks like.

Access to appropriate processing technologies, auxiliary equipment, maintenance, and operating supplies is a fundamental need, but it is not a panacea. For example furniture manufacturing can thrive on lower technology, provided that skilled manpower compensates the lack of higher technology and produces true added value through authentic design and artistic handwork.

Poor access to capital at reasonable cost is no doubt one major obstacle to upgrading the industries and their technologies. Financing the necessary investments from cash flow is an alternative available to only a few of the most successful companies. Commercial banks tend to have excessive collateral requirements and penalizing risk-premiums on interest rates for "sunset" industry like wood processing. The current loan deficit in Indonesia is in a stark contrast with the ease of major capital investments in the 1990s. Investing in value-added production is nowadays costly, and it is hardly possible at all in conditions where even the primary processing sector is not yet capable of operating profitable and supplying the world markets according to the strict quality requirements applied.

Problems are often encountered in the distribution of imported supplies (most notably spares & tools, chemicals, finishes, other consumables). Market failings are commonly found in many ITTO producer countries. They may result from just a single supplier's behavior, or excessive pricing, high import duties, inflated transportation costs, delayed delivery, etc. Struggling with these obstacles erodes the competitiveness of tropical further processors, who

are in great need of imported supplies for producing competitive and marketable products of the required quality. (ITC & ITTO, 2002)

In Indonesia, one can question the adoption of investments as a tool for competitiveness for many reasons. The plywood industry offers some examples on how withdrawal from all investments, and running down the fully-depreciated existing machinery can actually allow high profitability in times of brisk international demand. Based on field visits done by Tom Waggener under Study Group A in East Kalimantan, the local industry is resorting to minimal technical upgrading and essential technical service and maintenance in their current operating conditions. This makes perfect sense as long as the mills manage to procure logs of relatively good sizes and qualities, but it backfires immediately if they are to swiftly shift into use of smaller diameter tropical logs or plantation-grown peeler logs. This type of change will necessitate a nearly complete reshuffle of the peeling lathes. The rest of the process technology may require much less modifications if the industry re-orientates its strategies for the future. In any case, the country remains heavily dependent on foreign technology as local machinery manufacturing is largely absent.

5.2.4 Product development and design

There are differing levels of product development efforts as per size of enterprise (in ITC & ITTO, 2002):

1. Producers of furniture working at the craft, or mechanized craft level, usually do not develop any new products themselves: they copy items showed by their clients, or produce from customers' rough sketches or photos from catalogues. As they make more products, they build up their own range of models, which they offer to their clients. The obvious weakness in copying a visual design lies in the lack of knowledge of the correct physical design, leading into weak structure, inefficient manufacturing process and poor ergonomics.
2. Furniture enterprises that produce in larger series usually make to product designs supplied by their clients, be it a local enterprise, such as a hotel, a bank, an insurance company or a school, or from their overseas customer. The products are designed especially for industrial (serial) production, therefore factors such as the minimization of panel wastage and the commercial availability of sawnwood cross-sections, are taken into account.
3. The largest firms may employ their own design departments and in-house designers. Even when these firms obtain designs from outsiders, their design teams do all the final drawings, as well as

any modifications to the original designs in order to expand the range of products in the collection. They may be capable, through a value analysis exercise, of adding a new lease of life to an existing design, whose acceptance is waning on the market.

In several tropical countries, authorities responsible for the promotion of exports have created design centers. These usually cover all manufactured products, as well as graphic design (packaging and logos). In countries that have a progressive wood processing industry, the design centers have often been the driving forces behind the introduction of new ideas and concepts. They keep archives, can collaborate with national manufacturers' associations in organizing furniture design competitions or other events to attract designers to the furniture sector. The Philippines has been successful in basing part of their competitiveness in furniture exports on original designs, and design center approach has been applied there.

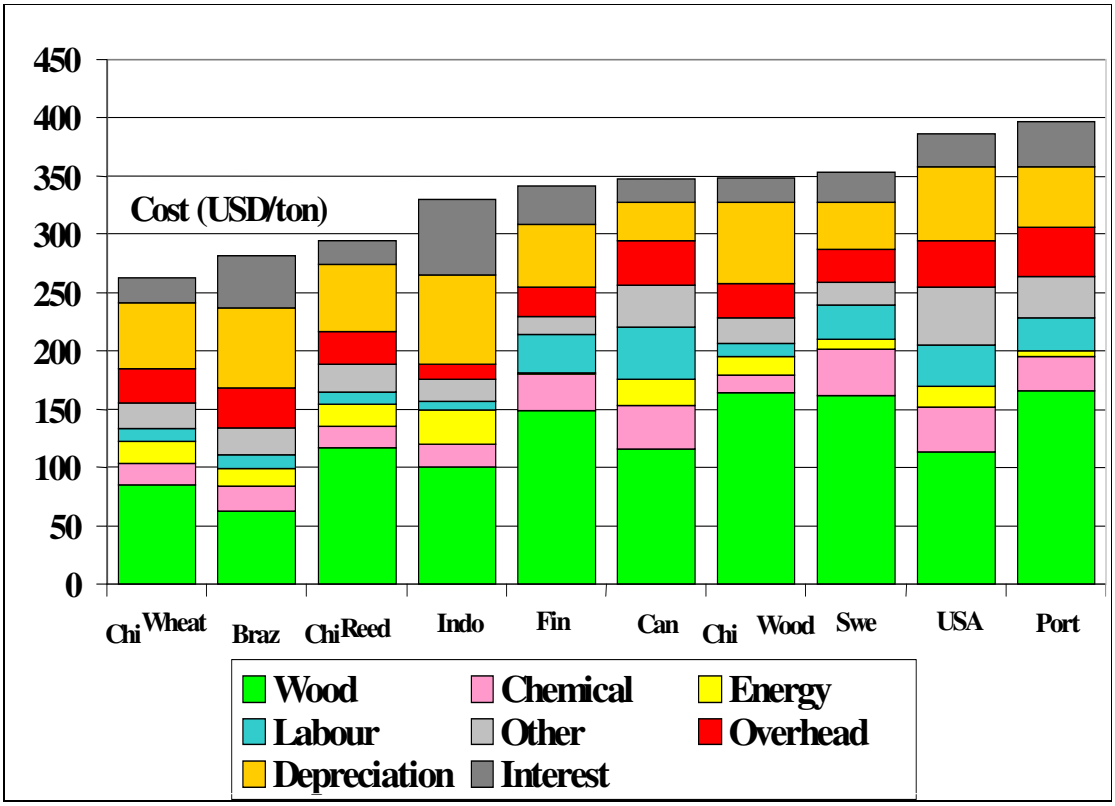
Looking at the current examples in plantation-rich countries, Malaysia is only now starting to attach more original designs to its rubberwood furniture. The country thrived in the exports of low-cost furniture for the masses throughout the 1990s, but it has now been sensitized about the difficulty in moving to the upper market segments without original designs and furniture brands. The low-cost image of rubberwood may, however, prove difficult to change. Fortunately, rubberwood takes well stains and allows imitation of appearance of more high-quality species.

5.2.5 Comparison of production costs

Reliable data on production cost structures for Indonesia and its competitors is not readily available, and its collection will involve a substantial cost and effort. This information is safeguarded by industry specialists, consultants and industry operators themselves for competition reasons. Figure 5.3 shows the financial comparison of production cost structures of new (greenfield investment) hardwood chemical pulp plants in different countries. The product is not fully standardized, what should be taken into account in country comparisons. Indonesia's major cost advantages are in wood, labor, chemicals and overhead costs, while energy, depreciation and interest costs pose a disadvantage. While Indonesia's position is favorable against competitors in the developed world, it is nevertheless outplayed by competitors in the South, most notably Brazil. Non-wood pulp making costs in China are very cost-competitive. They are, on the other hand, polluting and inefficient, yielding poorer

quality of pulp with a limited paper range to be furnished. They are increasingly being closed down and replaced with wood pulp.

Figure 5.3 Cost structures of major hardwood pulp producer countries (2001)



Source: Indufor Oy (2002)

5.2.6 Concluding remarks

In spite of the quite impressive levels of exports to the international markets, there is a growing notion that Indonesia's competitiveness will become threatened in the near future. Reasons for this include dwindling of high-quality log supplies, rampant illegal logging and trade, and the state of domestic primary processing, which is still producing too much ordinary plywood and sawn timber without a significant added value contribution or product diversification.

The dominant trend in tropical timber trade throughout 1990s was the effort to export more further (secondary) processed wood products. Heavily falling prices for primary processed tropical wood products offered an added incentive to do so after the 1997 economic

turbulence and currency depreciation across Asia. More than anything else, this reflects a strategy to earn more out of less, i.e. to capture higher added value from the declining natural tropical wood resource. Indonesia has been one of the countries aiming to follow this trend. It must be said, however, that there is currently a very thin knowledge on the profitability rates of different wood export product sectors in Indonesia, so the assessment on how beneficial the chosen strategy has been for the country as a whole remains obscure.

Throughout is export expansion era, Indonesia's position has been secured by comparative advantages – but these have a limited lasting (as long as low-cost resources existed widely in the country). It has not yet taken real steps towards anything of a kind of dynamic competitive advantage that should be the target. Availability of raw materials both in quality and quantity and, access to them (road infrastructure, waterways, harvesting technology) have supported Indonesia's climb into that position. Compared to Latin America and Africa, or even to the other Asian countries, the costs of wood exploitation appear to have been much cheaper in Indonesia. Downsizing pressures and limited capacity utilization in wood industries indicate that a new reality must be accepted. "Adjust or die slowly" is a valid proposition faced by the industry.

The second comparative advantage of Indonesia has traditionally been the availability of very cheap labor. Due to the density and growth of population in Indonesia, it incubates a significant number of workforce far into the future. The demand of work is greater than the availability of jobs, inducing the existence of low-wage economy inside wood sector. On the other hand, massive quantity of manpower is insufficiently skilled, what results in poor productivity of labor. Over a long term, the current labor condition will not support a competitive wood sector in Indonesia.

Faced with these grave problems, Indonesian forest sector enterprises would be wise to establish training center(s) to improve the human resource situation. There is also a growing need to establish R&D division or department, or re-orientate existing research institutions in order to increase their productivity and efficiency. Crucially needed services would be e.g. improved market intelligence, technical product knowledge, foreign standards, etc. For the last, it seems that many enterprises are not yet aware of, or count for, cost centers, what

impairs their costing and pricing. A quality standards certification body should be a necessity in order to maintain the quality of products and services.

5.3 Measuring comparative cost advantage

5.3.1 Definitions

Comparative cost advantages of wood products may be defined as costs of producing timber products evaluated in terms of economic values. Economic value may differ from financial value because of market distortions prevailing in the marketplace. In other words, financial value may be defined as value adopted by firms in calculating profit earned, whereas economic value may be defined as societal values adopted by government in allocating forest resources. In this sense, the competitiveness of timber products may be improved if there are less market distortions in forest products markets. Globalization can be interpreted as a positive driver in this context, because it is *"a process of economic integration of the entire world through (1) the removal of barriers to free trade and capital mobility, and (2) through diffusion of knowledge and information"*. (Asian Development Outlook, 2003)

5.3.2 Indicators calculated

The comparative advantage of wood products may be measured by using several indicators. In this study it is measured through two indicators, which are: a) domestic resource cost (DRC) and b) domestic resource cost ratio (DRCR). These indicators are computed by using the following formulas:

DRC = EDF/(EWP-EFF) .....(1)

where

DRC = domestic resource cost of producing per unit of wood product (Rp/US$)

EDF = economic value of domestic factors used to produce per unit of wood product (Rp/m^3)

EWP = economic value per unit wood product sold approached by its export price (US$/$m^3$)

EFF = economic value of foreign factors used to produce per unit wood product (US$/$m^3$)

DRCR = DRC/EXR .....(2)

where

DRCR = resource cost ratio of wood product

EXR = shadow exchange rate of Rupiah to US $ (Rp/US$)

5.3.3 Results

The concepts of DRC and DRCR are static so that they cannot reflect constant change of trade patterns or restrictions as they appear in reality. To see the effect of dynamic phenomena, sensitivity analysis can be applied to evaluate the effect of changes in prices of inputs and outputs over time. Some previous studies conducted on this matter in Indonesia suggest that the DRC of plywood and sawnwood were insensitive to changes in their input prices but sensitive to changes in their output prices. Results of these sensitivity analyses indicated that plywood lost its comparative advantage after output prices decreased 10% for those located in Java and 15% for those outside Java. Small-scale sawnwood industry still enjoyed comparative advantage when its output price decreased 15%. However, sawntimber processed by medium and large scales industries generally maintained comparative advantages after its output prices decreased 10%.

Unfortunately, current studies on comparative advantages of Indonesian wood products were unavailable from literature. Figures of previous studies serve, however, as a starting point to analyze the more recent comparative advantage development of Indonesian wood products. For this purpose, an extensive effort was taken to calculate the figures of DRC and DRCR by using available current data. The results (Table 5.4) indicate that at present situation, the comparative advantage of Indo plywood cannot be generalized. Those produced by some mills may still have comparative advantage but importantly, many do not. Calculation by using data for 2000 indicates that plywood had no comparative advantage if its output price remained at US$ 250 per m^3, whereas data for 2003 reflects that comparative advantage of plywood still existed if its output price increased by 20%. With respect to sawnwood, the calculations indicated that at present situation, its comparative advantage still existed even when its output price (US$ 400 per m^3) decreased by 20%.

Table 5.4 Effect of output price changes on domestic resource cost and domestic resource cost ratio of primary wood products (2000 and 2003)

Descriptions	Decrease in Output Price			
	0%	10%	15%	20%
Sawnwood (2000)				
Price US$ 400 per m^3				
DRC	4,421	4,954	5,271	5,632
DRCR	0.45	0.51	0.54	0.58
Plywood (2000)				
Price US$ 250 per m^3				
DRC	14,958	17,302	18,773	20,517
DRCR	1.54	1.78	1.93	2.11
Plywood (2003)				
Price US$ 250 per m^3				
DRC	7,299	8,256	8,835	9,501
DRCR	0.75	0.85	0.91	0.98

5.4 Measuring competitive advantage

5.4.1 Indicators calculated

The competitive advantage of wood products can be measured by using several indicators. However, in this study, we limit analysis in three indicators, which are: a) private cost ratio (PCR), b) revealed comparative advantage index (RCAI), and c) constant market share (CMS).

As the following assessment will show, one has to be careful in interpreting these convenient indicators too narrowly. Some of the results received actually reflect much more the impact of government policies than the true competitiveness between the wood processing segments of the country. This method is blind to non-calculated qualitative changes in the markets and trade practices, such as quality of products, the advent of certified forest products markets, environmental causes for changing suppliers, concerns over illegality in logging and trade, etc. All these factors have tended to become more visible after 1997.

5.4.2 Private cost ratio (PCR)

Private Cost Ratio may be defined as ratio of domestic resource cost and the difference between price of output and foreign cost components evaluated in financial values. Therefore it indicates the competitiveness of a product produced compared to competing products

imported from abroad. A product is categorized to be competitive if its PCR < 1 and less competitive if its PCR > 1.

This indicator is computed by using the following formula:

PCR = (FDF/(FWD – FTF)) .....(3)

where

PCR = private cost ratio of producing per unit of wood product

FDF = financial value of domestic factors used to produce per unit of wood product (Rp/m^3)

FWD = financial value per unit wood product sold approached by its export price (Rp/m^3)

FTF = financial value of tradable factors used to produce per unit wood product (Rp/m^3)

By using the proportion of domestic and foreign factor costs of the study by Bunasor (1986) and production costs of the study by Astana and Mutaqin (2002), the private cost ratio of wood products in year 2000 was calculated and is presented in Table 5.5. It can be seen that in contrast with situation in year 1980s, sawnwood in year 2000s generally had higher competitive advantages compared with plywood, even with moulding, which is indicated by their PCRs. It was less than 0.6 for sawnwood and above 0.8 but less than unity for moulding, which indicate that both products had competitive advantages. In contrast, plywood with PCR greater than unity indicated that it had no more competitive advantage. Nevertheless, moulding was sensitive to changes in its price. The decrease in its price by 10%, it generally caused its competitiveness disappear.

Table 5.5 Private cost ratio and effect of decrease in output prices of Indonesian wood products, 2000

Type of Product	PCR	PCR		
		Decrease in Output Price		
		5%	10%	15%
Sawnwood				
a. USD 1.0 = Rp 10,000	0.5572	0.5896	0.6259	0.6670
b. USD 1.0 = Rp 9,000	0.5614	0.5941	0.6307	0.6721
c. USD 1.0 = Rp 8,000	0.5667	0.5997	0.6367	0.6785
Plywood				
a. USD 1.0 = Rp 10,000	1.3458	1.4390	1.5460	1.6703
b. USD 1.0 = Rp 9,000	1.4255	1.5257	1.6410	1.7751
c. USD 1.0 = Rp 8,000	1.5283	1.6376	1.7638	1.9111
Moulding				
a. USD 1.0 = Rp 10,000	0.8711	0.9244	0.9845	1.0530
b. USD 1.0 = Rp 9,000	0.8939	0.9487	1.0107	1.0813
c. USD 1.0 = Rp 8,000	0.9225	0.9793	1.0436	1.1169

Remarks: logs consumed by industry is under free markets
a, b and c: official exchange rate.

Recalculation of PCR for sawnwood and plywood by using actual currency (US$ 1.0=Rp 8,400) and new data source is presented in Table 5.6. PCR for sawnwood confirms that the product had competitive advantage. To plywood, however, its competitive advantage is still inconclusive under PCR measure since data available is controversial. One data source suggests its PCR is more than unity, concluding that plywood has no more competitive advantage. Another data source indicated that its PCR was less than unity, meaning that plywood still has competitive advantage. In this respect, it is difficult to make a clear conclusion since data from different sources yield variable results. The best way to conclude whether plywood has or has not competitive advantage may be to use other measures such as RCAI and CMS analysis.

Table 5.6 Private cost ratio and effect of decrease in output prices of primary wood products (2000 and 2003)

Descriptions	Decrease in Output Price			
	0%	10%	15%	20%
Sawnwood (2000)	PCR	PCR	PCR	PCR
Price US$ 400 per m^3	0.44	0.49	0.52	0.56
Plywood (2000)				
Price US$ 250 per m^3	1.38	1.59	1.72	1.88
Plywood (2003)				
Price US$ 250 per m^3	0.67	0.76	0.81	0.87

5.4.3 Revealed comparative advantage index (RCAI)

5.4.3.1 Definition

RCAI may be defined as the ratio of a product exports and (total) wood products exports of exporting country, divided by the ratio of the product exports of the world's wood products exports. It, therefore, indicates the capability of a country to export its products to the world markets. A product is competitive if its RCAI > 1 and less competitive if its RCA < 1.

This indicator is computed by using the following formula:

$$(RCAI^i)_a = (X^i_a / X^t_a) / (X^i_w / X^t_w) \quad \text{..... (4)}$$

where

RCAI = revealed comparative advantage index

X^i_a **= Indonesian export value of wood product i**

X^t_a **= Indonesian export value of wood products**

X^i_w **= world export value of wood product i**

X^t_w **= world export value of wood products**

5.4.3.2 Primary processed wood products

RCAIs of primary wood products are calculated and presented in Table 5.7. Between 1997-2001, RCAI of three primary wood products differed from one to another. It was greater than unity for plywood (7.48-10.98), what indicates that plywood enjoyed a competitive advantage. Whereas it was less than unity for sawnwood (0.25-0.98), indicating that the product was less competitive in world markets. For wood pulp, it varied between 0.86-1.91, what indicates that wood pulp was less competitive in the world markets. In period 1997-

2001, RCAI of plywood tended to decline, while in contrast RCAI of sawnwood tended to increase, and RCAI of wood pulp was relatively stable but gradually improving.

The issue may not be separated from the government policies in 1980s, which were directed to induce the development of plywood industry. Log exports were banned to open opportunities for plywood industry to develop vigorously. In contrast, exports of sawnwood in 1989 was very highly taxed, with the aim of fulfilling domestic consumption and avoid competition over the use of logs with plywood industry. Its exports were slow to develop, whereas plywood exporters found easy access to international markets. In this respect, it may be true that plywood had higher RCAI compared to sawntimber since RCAI defined as the ratio of plywood export and Indonesian primary wood products exports, divided by the ratio of world plywood export and world primary wood products exports. But the chosen policy was the reason for a positive result of RCAI, rather than the quality of the industry.

However, since 1998, following the policy reforms in Indonesia, removal of trade restrictions on sawnwood exports has been done by reducing its export tax. Since 1998 sawnwood exports have experienced an increase to the international markets. By definition of RCAI, the tendency of the increase in sawnwood exports resulted in improving its RCAI. To some extent, though, it may also indicate that RCAI of plywood declined since there has been a significant competition over the use of logs between the primary wood industries, especially between producers of sawnwood and plywood.

Table 5.7 Revealed comparative advantage index of primary wood products (1997-2001)

Primary Wood Products	RCAI				
	1997	**1998**	**1999**	**2000**	**2001**
Plywood	*10.98*	*9.60*	*11.93*	*7.48*	*7.62*
Wood pulp	0.91	1.91	0.86	0.88	0.89
Sawntimber	**0.25**	**0.44**	**0.31**	**0.66**	**0.98**

Bold: increasing *Italic: declining* Underlined: relatively stable but tend to increase

The Indonesian pulp and paper industry was generally established in the early 1990s. At present, it is still growing in size. Wood pulp exports have started to increase since the middle of 1990s. This is due to the fact that plantation forests outside Java, which were established in integration with wood pulp and paper industry, have generally matured and started to yield

more harvest. Yet, most of the industry still consumes logs from natural forest. In most cases, the use of logs from natural forest has remained greater than log intake from plantation forests. Environmental campaigns by national and international NGOs affect the development of wood pulp production. The significant effect was the imposition of government act on moratorium of forest conversion. In fact, logs from forest conversion had commonly been a major raw material for wood pulp production. By definition, RCAI of wood pulp was low and to some degree, unstable. In this regard, the dubious sustainability of logs consumed by the industry may have attributed to the issue. Nevertheless, as plantation forests develop, the competitiveness of Indonesian wood pulp may increase in future. The industry has fortunately taken steps to improve its environmental and social stature, e.g. by commissioning social impact assessments of its investments (Indufor project, 2004).

5.4.3.3 Further processed wood products

The RCAIs of further processed wood products are presented in Table 5.8. In period 1998-2002, there were nine products with relatively high RCAI. The first three of the products were: 1) bamboo seats/chairs (9.02-11.56), 2) hardwood shaped/grooved (2.87-4.77) and 3) wooden doors/frames (1.64-1.84). The second three of the products were: 4) wooden furniture n.e.s. (1.14-1.43), 5) builder's wood (1.00-1.49), and 6) wooden picture frames (0.99-1.45). The last three of the products were: 7) wood marquetry/carvings (1.18-1.40), 8) wooden bedroom furniture (0.88-1.10), and 9) seats with wooden frames (0.82-0.97).

The seven other products were those with RCAI less than 0.5. These were 1) wooden boxes/drums/cases, 2) wooden pallets etc., 3) wooden windows/frames, and 4) wooden table/kitchenware, 5) wooden office furniture, 6) wooden kitchen furniture, and 7) furniture parts.

Table 5.8 Revealed comparative advantage index of Indonesian further processed wood products (1998-2002)

Secondary Wood Products	RCAI				
	1998	1999	2000	2001	2002
Hardwood Shaped/Grooved	*4.77*	*4.18*	*4.02*	*3.57*	*2.87*
Wooden boxes/Drums/Cases	0.04	0.06	0.04	0.06	0.09
Wooden pallets etc.	0.17	0.16	0.23	0.34	0.31
Wooden Windows/Frames	0.25	0.17	0.24	0.16	0.18
Wooden Doors/Frames	1.84	1.68	1.77	1.64	1.80
Builder's wood n.e.s.	*1.49*	*1.18*	*1.33*	*1.00*	*1.06*
Wooden picture etc. frames	**0.99**	**1.11**	**1.16**	**1.28**	**1.45**
Wooden table/kitchenware	0.44	0.42	0.41	0.36	0.26
Wood marquetry/Carvings	**1.40**	**1.40**	**1.18**	**1.29**	**1.27**
Bamboo/etc. Seats/Chairs	**10.39**	**9.86**	**9.02**	**10.46**	**11.56**
Seats with Wood Frames	0.82	0.94	0.95	0.97	0.87
Wooden office furniture	0.13	0.10	0.09	0.15	0.20
Wooden kitchen furniture	0.16	0.14	0.13	0.12	0.13
Wooden bedroom furniture	**0.88**	**1.06**	**0.98**	**1.04**	**1.10**
Wooden furniture n.e.s.	**1.14**	**1.26**	**1.28**	**1.40**	**1.43**
Furniture Parts	0.39	0.36	0.35	0.35	0.35

Bold: increasing *Italic: declining* Underlined: relatively stable but tend to increase

The nine products with high RCAI can further be classified into products with RCAI decreasing, RCAI stable and RCAI increasing. The products included into those with RCAI decreasing were: 1) hardwood shaped/grooved and 2) builders wood. Whereas the products included into those with RCAI stable were: 3) wooden doors/frames and 4) seats with wooden frames. The five other products were included into those with RCAI increasing. These five products were: 5) bamboo seats/chairs, 6) wood marquetry/carvings, 7) wooden furniture n.e.s., 8) wooden picture frames and 9) wooden bedroom furniture.

5.4.4 Constant market share (CMS)

5.4.4.1 Definition

Constant market share is defined as an exporting country's market share in imports of a product in importing country. The word constant implies that this share should be maintained by the exporting country over time, if it wants to hold on to its competitiveness. It can be used to evaluate export growth of exporting country in relation to import growth in importing country. In this respect, a product's competitiveness in world markets may be indicated by the positive or negative signs of change from constant market share analysis. Positive sign indicates a product exported is increasingly competitive and negative sign indicates loss of competitiveness.

This indicator is computed by using the following formula:

$$CMS = (X^{twp}_{t} - X^{twp}_{0}) = m^{twp} X^{twp}_{0} + \Sigma \{(m^{wpi} - m^{twp}) X^{wpi}_{0} \} + \Sigma (X^{wpi}_{t} - X^{wpi}_{0} - m^{wpi} X^{wpi}_{0}) \quad (5)$$

CMS = constant market share reflected by three terms:

a) Increase in Indonesian wood products export by $m^{twp} X^{twp}_{0}$

b) Indonesian wood products composition by $\Sigma \{(m^{wpi} - m^{twp}) X^{wpi}_{0} \}$

c) Competitiveness of Indonesian wood products by $\Sigma (X^{wpi}_{t} - X^{wpi}_{0} - m^{wpi} X^{wpi}_{0})$

where

X^{twp}_{t} = total export value of Indonesian wood products period t (US$)

X^{twp}_{0} = total export value of Indonesian wood products period 0 (US$)

X^{wpi}_{t} = export value of Indonesian wood product i period t (US$)

X^{wpi}_{0} = export value of Indonesian wood product i period t (US$)

m^{twp} = percentage change in total import value of wood products of a country destination (%)

m^{wpi} = percentage change in import value of a country destination for i Indonesian wood product (%)

5.4.4.2 Primary processed wood products

Sawnwood

CMS analysis indicates that Indonesian sawnwood export growth in 1998-2001 to ten major importing countries was generally not attributed to its competitiveness, except in five countries, namely Canada, France, Japan, the UK and USA (Table 5.9). In Canada, Indonesian sawnwood entered in a less-growth market, which is indicated by negative product composition imported (-7.35%). But its competitiveness effect accounted for 102.01%, which is greater than the product composition effect. This implies that 94.66% of its export growth to Canada was due to an increase in its competitiveness. The other 5.35% of its export growth was due to general increase in import demand for primary wood products of the country.

Sawnwood export growth to France and USA was similar to Canada. Although Indonesian sawnwood entered in a declining import market (negative product composition imported at -8.92% in France and -42.72% in USA), its competitiveness effect accounted for 91.63% to France and 99.99% to USA, which was greater than the product composition effect. It implies that its export growth to France and to USA, 82.71% and 57.27%, respectively, was due to a genuine increase in competitiveness. The other part of effect (17.29% to France and 42.73%

to USA) was caused by a general increase in import demand for primary wood products of these two countries.

To Japan, 18.86% of Indonesia's export growth was due to product change in composition imported. Although the import demand for primary wood products in Japan in 1998-2001 decreased up to 13.79%, its competitiveness effect accounted for 94.92%. It implies that 81.13% of Indonesia's export growth to Japan was attributed to an increase in its competitiveness. To the UK, import demand for primary wood products in 1997-2001 decreased (-23.73%) and Indonesian sawnwood exports entered in a decline market (-3.95%). However, its competitiveness effect on its export growth accounted for 137.68%. It suggests that the continuation of Indonesian sawnwood exports to the UK was partly due to its competitiveness, since its effect was greater than the effects of both import demand and product composition.

Indonesian sawnwood export growth to China, Germany, Korea, and Saudi Arabia all have similar characteristics. It can be chiefly maintained because of general increase in import demand for primary wood products in those countries. To China and Germany, general increase in import demand accounted for 94.16% and 37.40% respectively. In Korea and Saudi Arabia, it accounted for 60.33% and 96.39%, respectively. To these four countries, there was no genuine competitiveness effect on Indonesia's export growth. Effect of product import composition was very small, especially to China (5.84%), Germany (0.5%) and Saudi Arabia (3.6%). To Korea, it was higher at 39.67%.

On the negative side, Indonesian sawnwood export growth to the Netherlands cannot be maintained. It was not solely because of the absence of its competitiveness but equally a result of faltering import demand and product import composition. In 1997-2001, the import demand for primary wood products in this country tended to decrease (-38.20%), and Indonesian sawntimber export tended to enter in less market growth (-72.43%). Its competitiveness effect of Indonesian sawntimber was very small accounting for 10.64%. This suggests that its export growth can be maintained if its competitiveness could be increased by more than five times of current performance.

Table 5.9 Constant market share analysis of sawnwood export growth to ten major importing countries (1998-2001)

Ten Major Importing Countries	Sawnwood Export Growth		
	Due to general increase in import demand*	Due to wood product import composition	Due to increase in competitiveness
	%	%	%
Canada	5.35	-7.35	102.01
China	94.16	179.99	-174.15
France	17.29	-8.92	91.63
Germany	37.40	0.50	-137.90
Japan	-13.79	18.86	94.92
Korea, Republic of	60.33	145.49	-105.82
Netherlands	-38.20	-72.43	10.64
Saudi Arabia	96.39	9.16	-5.56
United Kingdom	-23.73	-13.95	137.68
USA	42.73	-42.72	99.99

* primary wood products

High competitiveness
Blue: high competitiveness, enter less market growth, under high import growth
Light green: high competitiveness, enter high market growth, under less import growth
Yellow: high competitiveness, enter less market growth, under less import growth
Less competitiveness
Red: less competitiveness, enter high market growth, under high import growth
Black: less competitiveness, enter less market growth, under less import growth

Plywood

CMS analysis indicates that Indonesian plywood export growth in 1998-2001 to ten major importing countries was generally not attributed to its competitiveness except in three countries, Canada, France, and the UK (Table 5.10). Its export growth to Canada was due to price competitiveness effect (69.72%), because it was greater than the total effects of general increase in import demand for primary wood products (5.35%), and product import composition (24.94%) of the country. Its export growth to France and the UK was likewise due to the effect of price competitiveness for the same reasons. The effect of price competitiveness of Indonesian plywood on its export growth to France (112.03%) was greater than the total effect of product import composition (-29.3%) and general increase in import demand of the country (17.3%). The same holds true for the effect of price competitiveness of Indonesian plywood on its export growth to the UK (88.15%). It was greater than the total effect of product import composition (35.58%) and general increase in import demand of the country (- 23.73%).

Table 5.10 Constant market share analysis of plywood export growth to ten major importing countries (1998-2001)

Ten Major Importing Countries	Plywood Export Growth		
	Due to general increase in import demand*	Due to wood product import composition	Due to increase in competitiveness
	%	%	%
Canada	5.35	24.94	69.72
China	94.16	-148.82	154.67
France	17.29	-29.33	112.03
Germany	37.40	-40.89	-96.51
Japan	-13.79	90.25	9.75
Korea, Republic of	60.33	123.16	-83.48
Netherlands	-38.20	-1.62	-60.18
Saudi Arabia	96.39	-142.41	146.02
United Kingdom	-23.73	35.58	88.15
USA	42.73	19.15	38.12

* primary wood products

High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Light green: high competitiveness, enter high market growth, under less import growth

Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth
Red: less competitiveness, enter high market growth, under high import growth
Black: less competitiveness, enter less market growth, under less import growth

In contrast, of Indonesian plywood export growth to China in 1998-2001, 94.16% was due to general increase in import demand for primary wood products in that country. However, although its competitiveness effect accounted for 154.67% of its export growth, Indonesian plywood exports to China entered a declining import composition (-148.82%). It suggests that only 5.85% of its export growth was attributed to its competitiveness effect compared to 94.16% of the effect of general increase in import demand in China. In other words, Indonesian plywood export to China was less competitive since its export growth was dominantly affected by general increase in import demand for primary wood products of the country. To Germany, 37.40% of plywood export growth was due to general increase in import demand in that market. There was no competitiveness effect on plywood export growth to Germany, which is indicated by the negative sign of its competitiveness effect. In other words, if there was negative growth in import demand for primary wood products of the country, Indonesia will experience difficulty in exporting plywood.

Plywood export to Japan is similar to Germany but differs from source of its export growth. To both Japan and Germany, there was no competitiveness effect on its export growth. To Japan, its competitiveness effect accounted for only 9.75%, which is less than product composition effect accounting for 90.25% of its export growth. It suggests that although Japan import demand for primary wood products in 1997-2001 generally decreased, fortunately plywood export entered in high market growth, and hence, its export growth was still maintained. In contrast, sources of Indonesian plywood export growth to Rep. of Korea were from both effect of general increase in import demand for primary wood products (60.33%) and effect of product import composition which accounted for 39.68% (123.16% - 83.48%). Hence there was no true competitiveness effect (-83.48%) on its export growth.

Furthermore, its export growth to the Netherlands cannot be maintained. It is not caused by poor competitiveness effect alone (-60.18%), but is exacerbated by Indonesian plywood export entering in a decline market (-1.62%). Besides, the fact that there was general decline in import demand for primary wood products of the country (-38.20%) contributed to bleak outlook for Indo exports.

Export growth to Saudi Arabia was achieved with less of a true competitiveness. Plywood export to this country can be maintained to a great degree because of the general increase in import demand for primary wood products of the country (96.39%). Although its competitiveness effect accounted for 146.02%, its export entered in a falling import composition (-142.41%). Therefore, its net competitiveness effect on its export growth was smaller (146.02% -142.41% = 3.61%) than that of increase in import demand. To USA, its export growth can be maintained because of the effects of general increase in import demand (42.73%) and of product composition (19.15%) rather than by its competitiveness effect (38.12%).

Wood pulp

CMS analysis indicates that Indonesian wood pulp export growth in 1998-2001 to nine major importing countries was generally not attributed to its competitiveness except in four countries: France, Japan, the UK and USA (Table 5.11). Its export growth to France was 56.68% due to an increase in its competitiveness, 17.29% due to general increase in import

demand for primary wood products, and 26.03% due to product composition imported. This implies that its export growth to France was partly due to price competitiveness. To Japan, 0.83% of its export growth was due to product import composition, as import demand for primary wood products in 1998-2001 decreased (-13.79%) but its competitiveness effect accounted for 112.95%. This implies that 99.16% of its export growth to Japan was attributed to increase in its competitiveness. To the UK, 22.65% of Indonesia's export growth was due to product import composition, while import demand for primary products in 1997-2001 decreased (-23.73%). However, its competitiveness effect accounted for 101.08%. This implies that 77.35% of its export growth to Japan was attributed to an increase in its competitiveness. To USA, although Indonesian wood pulp entered in a falling market, which is indicated by negative product composition imported (-17.59%), its competitiveness effect accounted for 74.86% which is greater than the product composition effect. This indicates that 57.27% of its export growth to USA was due to an increase in its competitiveness since it is higher than import demand effect of 42.73%. USA is the world's largest buyer of wood pulp from the world markets.

In contrast, 94.16% of Indonesian wood pulp export growth to China in 1998-2001 happened due to general increase in import demand for primary wood products of the country. Although its competitiveness effect accounted for 76.49% of its export growth, Indonesian pulp export to China entered in a declining market, which is indicated by negative sign of its product composition imported (-70.65%). This suggests that only 5.84% of its export growth were attributed to its competitiveness effect.

To Korea, 60.33% of Indonesia's export growth was due to general increase in import demand for primary wood products, and 64.51% was due to product import composition since there was no competitiveness effect on its export growth (-0.25%).

Table 5.11 Constant market share analysis of wood pulp export growth to nine major importing countries (1998-2001)

Major Importing Countries	Wood Pulp Export Growth		
	Due to general increase in import demand*	Due to wood product import composition	Due to increase in competitiveness
	%	%	%
China	94.16	-70.65	76.49
France	17.29	26.03	56.68
Germany	37.40	-91.57	-45.83
Japan	-13.79	0.83	112.95
Korea, Republic of	60.33	64.76	-0.25
Netherlands	-38.20	13.33	-75.13
Saudi Arabia	96.39	-5.89	9.50
United Kingdom	-23.73	22.65	101.08
USA	42.73	-17.59	74.86

* primary wood products

High competitiveness

Dark green: high competitiveness, enter high market growth, under high import growth

Light green: high competitiveness, enter high market growth, under less import growth

Blue: high competitiveness, enter less market growth, under high import growth

Less competitiveness

Pink: less competitiveness, enter less market growth, under high import growth

Orange: less competitiveness, enter high market growth, under less import growth

Red: less competitiveness, enter high market growth, under high import growth

5.4.4.3 Further processed wood products

Of the 18 further processed wood products extracted for data, 11 wood products that hold of more than 1% in world market were identified for their competitiveness. The first six products were in the category of products for **building and decorative purposes**: 1) profiled hardwood, 2) wooden doors/frames, 3) ”other” builders’ joinery and carpentry, 4) wooden picture frames, 5) wood marquetry/carvings, and 6) wooden table & kitchenware. The second batch was **furniture items**: 7) seats with wooden frames, 8) bamboo, etc. seats & chairs, 9) wooden bedroom furniture, 10) wooden furniture n.e.s., and 11) furniture parts. All the furniture types assessed statistically for this study are not highlighted here, due to the fact that their importance did not reach a critical level. This applies for e.g. wooden kitchen furniture and office furniture, which technically more demanding, more strictly standardized and sold in fitted-in systems with functionality requirements to accommodate certain appliances. Therefore, these segments would be served with a great difficulty by producers like Indonesia.

Profiled hardwood

CMS analysis indicates that Indonesian export growth of profiled hardwood in 1998-2002 to eighteen major importing countries was generally not attributed to its competitiveness except in three countries, Australia, Canada, and France (Table 5.12). To Australia, 54.4% of its export growth was due to increase in its competitiveness, 42.4% due to general increase in import demand for secondary wood products, and 3.2% related to product composition imported. This suggests that the export growth to Australia was attributed to genuine competitiveness, since it was higher than the effects of both product composition and general increase in import demand for secondary wood products. This was also true for Canada and France.

The Indonesian export growth of profiled hardwood in the other 15 major importing countries, however, was generally due to product composition and general increase in import demand. There was less competitiveness effect on its export growth. Of the 15 countries, four countries were those where product composition and general increase in import demand were dominant effects, namely Denmark, the Netherlands, New Zealand, and Russia. There were nine other countries that may be grouped into those where general increase in import demand was dominant effect (China, Italy, Japan, Spain, the UK, USA, Saudi Arabia, and Malaysia). Finally, the export growth of profiled hardwood from Indonesia tended to decline in Germany and Turkey, since its competitiveness was not quite high to outplay the negative growth of general import demand.

Wooden doors & frames

Indonesian export growth in wooden doors & frames in 1998-2002 was only attributed to its competitiveness in Australia, Canada, France, and Russia (Table 5.13). To Australia, 56.8% of its export growth was due to increase in its competitiveness, 42.4% due to general increase in import demand for secondary wood products, and 0.8% due to product composition, implying that the export growth of wooden door/frames in this country was attributed to its competitiveness effect. The same assessment applies for Canada, France and Russia.

Table 5.12 Constant market share analysis of export growth of profiled hardwood to 17 major importing countries (1998-2002)

Major Importing Countries	Export Growth of Hardwood Shaped/Grooved		
	Due to general increase in import demand*	Due to wood product import composition	Due to increase in competitiveness
	%	%	%
AUSTRALIA	42.4	3.2	54.4
CANADA	33.1	-11.4	78.3
CHINA	55.3	-25.2	-130.1
DENMARK	74.5	7.5	-182.0
FRANCE	26.1	8.3	65.6
GERMANY	-88.6	4.7	-16.2
ITALY	796.7	-1,098.6	201.9
JAPAN	1,790.4	-695.8	-1,194.6
NETHERLANDS	39.0	6.6	-145.6
NEW ZEALAND	119.2	45.1	-64.2
RUSSIAN FED	42.1	32.5	25.4
SPAIN	56.6	-103.6	147.0
TURKEY	-68.3	-447.5	415.9
UNTD KINGDOM	1,549.0	-118.1	-1,330.9
USA,PR,USVI	146.8	-30.8	-16.1
SAUDI ARABIA	3.4	-413.3	309.9
MALAYSIA	156.0	-66.6	-189.4

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth
Black: less competitiveness, enter less market growth, under less import growth

To Canada, 5.7% of its export growth was due to product composition and 61.2% was due to increase in its competitiveness, implying that its export growth to this country was due to its competitiveness effect since it is higher than the effects of both import demand effect (33.1%) and product composition (5.7%). To France, 86.6% of Indonesia's export growth was due to increase in its competitiveness, whereas -12.7% was due to product composition and 26.1% was thanks to general increase in import demand for secondary wood products in France. The competitiveness effect was higher than the effects of both product composition and general increase in import demand for secondary wood products.

The Indonesian export growth of wooden door/frames to the 12 other major importing countries, however, was generally due to product composition and general increase in import demand. There was less competitiveness effect on its export growth. Of the 12 countries, three countries were those where product composition and general increase in import demand were really dominant effects (the Netherlands, New Zealand, and Spain). Whereas there were 8 other countries that may be grouped into those where general increase in import demand was a dominant effect (China, Denmark, Italy, Japan, the UK, USA, Saudi Arabia, and Malaysia. Finally, in Germany it was the product composition in imports that attributed most to the export growth of wooden door & frames from Indonesia.

Table 5.13 Constant market share analysis of export growth of wooden doors & frames to 16 major importing countries (1998-2002)

Major Importing Countries	Export Growth of Wooden Doors/ Frames		
	Due to general increase in import demand*	Due to wood product import composition	Due to increase in competitiveness
	%	%	%
AUSTRALIA	42.4	0.8	56.8
CANADA	33.1	5.7	61.2
CHINA	55.3	-0.4	-154.9
DENMARK	74.5	-0.9	-173.7
FRANCE	26.1	-12.7	86.6
GERMANY	-88.6	-2.5	-8.9
ITALY	796.7	-55.0	-841.7
JAPAN	1,790.4	-68.3	-1,822.1
NETHERLANDS	39.0	16.7	-155.7
NEW ZEALAND	119.2	1.2	-20.3
RUSSIAN FED	42.1	-104.3	162.2
SPAIN	56.6	0.6	42.7
UNTD KINGDOM	1,549.0	-378.8	-1,070.3
USA,PR,USVI	146.8	-1.7	-45.1
SAUDI ARABIA	3.4	-0.3	-103.1
MALAYSIA	156.0	-0.9	-255.1

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Black: less competitiveness, enter less market growth, under less import growth

"Other" builders' joinery and carpentry (BJC)

Indonesia's export growth in "other" BJC in 1998-2002 to 17 major importing countries was attributed to its competitiveness in just four countries: Australia, Canada, France and Russia (Table 5.14). To Australia, 53.9% of its export growth was due competitiveness boost, 42.4% was due to general increase in import demand for secondary wood products, and 3.7% was induced by product composition in imports. Identical reasoning can be given for Indonesia's performance in Canada, France, and Russia.

Indonesia's export growth to the 12 other major importing countries was mainly caused by product import composition and general increase in import demand. There was less competitiveness effect on its export growth. Of these 12 countries, four (Denmark, Spain, and Saudi Arabia) were those where product composition and general increase in import demand were dominant effects. General increase in import demand was the prime reason in China, Italy, Japan, the Netherlands, the UK, USA, and Malaysia. Finally, the export growth of "other" BJC from Indonesia tended to decline in Germany and Turkey since its competitiveness was not high enough to balance the negative general import demand.

Wooden picture frames

Indonesia's export growth was attributed to its competitiveness in three markets: Australia, Canada, and France (Table 5.15). To Australia, 56.9% of its export growth was due to increase in its competitiveness, 42.4% came out of general increase in import demand for secondary wood products, and just 0.6% was due to product composition. To Canada 63.4% of growth was due to increase in competitiveness, underlining its importance against the smaller effects of both import demand effect (33.1%) and product composition (3.5%). Competitiveness contributed up to 75.7% for Indonesia's export growth in France, while impacts of product import composition (-1.8%) and increase in import demand for secondary wood products (26.1%) were minor factors.

In seven other countries, the product composition and general increase in import demand were dominant effects in China, Italy, Japan, New Zealand, Spain, the UK, and Saudi Arabia. There were further on three countries where Indo exports received their major boost from the general increase in imports: Denmark, USA, and Malaysia.

Table 5.14 Constant market share analysis of export growth of builders's joinery and carpentry, n.e.s. to 16 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Builders Wood Nes		
	Due to general increase in import demand* (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	3.7	53.9
CANADA	33.1	-12.8	79.7
CHINA	55.3	-103.9	-51.4
DENMARK	74.5	94.3	-268.9
FRANCE	26.1	13.5	60.4
GERMANY	-88.6	-40.6	29.1
ITALY	796.7	-30.4	-866.3
JAPAN	1,790.4	-62.7	-1,827.7
NETHERLANDS	39.0	-67.3	-71.7
RUSSIAN FED	42.1	6.7	51.2
SPAIN	56.6	10.6	32.8
TURKEY	-68.3	3.1	-34.8
UNTD KINGDOM	1,549.0	-19.1	-1,429.9
USA,PR,USVI	146.8	-11.9	-34.9
SAUDI ARABIA	3.4	0.0	-103.4
MALAYSIA	156.0	-20.8	-235.2

* secondary wood products
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth
Black: less competitiveness, enter less market growth, under less import growth

Table 5.15 Constant market share analysis of export growth of wood picture etc. frames to 16 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Wood Picture etc Frames		
	Due to increase in import demand* (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	0.6	56.9
CANADA	33.1	3.5	63.4
CHINA	55.3	0.0	-155.3
DENMARK	74.5	-0.7	-173.9
FRANCE	26.1	-1.8	75.7
GERMANY	-88.6	-0.5	-11.0
ITALY	796.7	1.5	-898.2
JAPAN	1,790.4	47.8	-1,938.2
NETHERLANDS	39.0	-1.8	-137.2
NEW ZEALAND	119.2	0.7	-19.9
SPAIN	56.6	0.3	43.1
TURKEY	-68.3	-0.1	-31.6
UNTD KINGDOM	1,549.0	9.3	-1,458.3
USA,PR,USVI	146.8	-0.3	-46.5
SAUDI ARABIA	3.4	0.0	-103.4
MALAYSIA	156.0	-0.3	-255.7

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Black: less competitiveness, enter less market growth, under less import growth

Wood marquetry/carvings

Export growth of wood marquetry/carvings in 1998-2002 to 18 major importing countries was caused by Indonesia's competitiveness in Australia, Canada, and France (Table 5.16). To Australia, 59.1% of its export growth was due to increase in its competitiveness, 42.4% was due to general increase in import demand for secondary wood products, and -1.5% came through product import composition. The same order applies to Canada and France.

On Indo export growth to the 14 other major importing countries, there was less impact stemming from the competitiveness effect. Of those 14 countries, China, Italy, New Zealand, Russia, and Saudi Arabia showed the product import composition and general increase in import demand to give rise to Indo exports, more than anything else. The general increase in

import demand was the reason for growth in Denmark, Japan, and Netherlands, as well as in Spain, the UK, USA, and Malaysia.

Table 5.16 Constant market share analysis of export growth of wood marquetry/carvings to 17 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Wood Marquetry/Carvings		
	Due to general increase in import demand * (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	-1.5	59.1
CANADA	33.1	3.3	63.6
CHINA	55.3	0.1	-155.4
DENMARK	74.5	-10.9	-163.6
FRANCE	26.1	-3.1	77.0
GERMANY	-88.6	-1.9	-9.5
ITALY	796.7	61.0	-957.7
JAPAN	1,790.4	-51.3	-1,839.1
NETHERLANDS	39.0	-4.2	-134.8
NEW ZEALAND	119.2	2.6	-21.7
RUSSIAN FED	42.1	14.4	43.6
SPAIN	56.6	-5.1	48.4
TURKEY	-68.3	-0.5	-31.1
UNTD KINGDOM	1,549.0	-116.7	-1,332.3
USA,PR,USVI	146.8	-5.7	-41.2
SAUDI ARABIA	3.4	0.0	-103.4
MALAYSIA	156.0	-2.6	-253.4

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Black: less competitiveness, enter less market growth, under less import growth

Wooden table & kitchenware

Indonesian wooden table & kitchenware (WTK) exports to 14 major importing countries in 1998-2002 were attributed to competitiveness in Australia, Canada and France (Table 5.17). Of the total effect, 57.6% of Indo export growth in Australia's was from the price competitiveness, 66.6% in Canada and 74.4% in France. Its export growth to 12 other major

importing countries was generally due to product composition and general increase in import demand. The effect of price competitiveness was smaller.

In five countries the product import composition and general increase in import demand were the dominant factors for Indonesia export growth (Denmark, Italy, the Netherlands, New Zealand, Spain, and Saudi Arabia). General increase in import demand played a major role for boosting Indo exports in Japan, the UK, and USA.

Table 5.17 Constant market share analysis of export growth of wood table & kitchenware to 14 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Wood Table/Kitchen Ware		
	Due to general increase in import demand* (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	-0.1	57.6
CANADA	33.1	0.3	66.6
DENMARK	74.5	4.0	-178.5
FRANCE	26.1	-0.5	74.4
GERMANY	-88.6	-0.4	-11.0
ITALY	796.7	0.7	-897.4
JAPAN	1,790.4	-88.3	-1,802.1
NETHERLANDS	39.0	0.3	-139.3
NEW ZEALAND	119.2	0.8	-19.9
SPAIN	56.6	0.3	43.1
TURKEY	-68.3	0.1	-31.7
UNTD KINGDOM	1,549.0	-1.5	-1,447.5
USA,PR,USVI	146.8	-1.2	-45.6
SAUDI ARABIA	3.4	0.1	-103.4

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth
Black: less competitiveness, enter less market growth, under less import growth

Seats with wooden frames

Indonesian export growth in seats with wooden frames in 1998-2002 to 17 major importing countries was attributed to its competitiveness in Australia, Canada, France, and Russia (Table 5.18). In Australia, 64.6% of its export growth was due to increase in its

competitiveness, 42.4% was explained by general increase in import demand for secondary wood products, and -7.0% impact came from product import composition. Similar pattern of results held true for Canada, France and Russia.

Indonesia's export growth to the 13 other major importing countries was mostly due to product composition and general increase in import demand, and less affected by competitiveness. In China, Italy, Spain, and USA, product composition and general increase in import demand induced growth in Indo exports. Countries where general increase in import demand dominated in Denmark, Japan, the Netherlands, New Zealand, the UK, Saudi Arabia, and Malaysia.

Table 5.18 Constant market share analysis of export growth of seats with wooden frames to 17 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Seats nes, Wood Frames		
	Due to general increase in import demand* (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	-7.0	64.6
CANADA	33.1	15.9	51.0
CHINA	55.3	0.3	-155.6
DENMARK	74.5	-92.7	-81.8
FRANCE	26.1	21.2	52.6
GERMANY	-88.6	22.7	-34.2
ITALY	796.7	11.2	-907.9
JAPAN	1,790.4	-193.4	-1,697.0
NETHERLANDS	39.0	-24.8	-114.2
NEW ZEALAND	119.2	-25.1	6.0
RUSSIAN FED	42.1	0.2	57.8
SPAIN	56.6	6.8	36.6
TURKEY	-68.3	4.7	-36.4
UNTD KINGDOM	1,549.0	-157.1	-1,291.9
USA,PR,USVI	146.8	2.6	-49.4
SAUDI ARABIA	3.4	-1.3	-102.1
MALAYSIA	156.0	-2.9	-253.1

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth

Bamboo etc. seats & chairs

Indonesia's competitiveness boosted exports in Australia, Canada, and France (Table 5.19). To Australia, 57.7% of its export growth was due to increase in its competitiveness, 42.4% due to general increase in import demand for secondary wood products and -0.1% due to product import composition, therefore showing a pronounced role of true competitiveness. Results in Canada and France looked similar.

The Indonesian export growth of bamboo etc. seats & chairs in the 14 other major importing countries, however, was generally due to product composition and general increase in import demand. There was less competitiveness effect on its export growth. Product import composition and general increase in import demand played a major role in China, New Zealand, Russia, and USA. Whereas there were nine other countries where general increase in import demand was the dominant effect (Denmark, Italy, Japan, the Netherlands, Spain, the UK, Saudi Arabia, and Malaysia.

Table 5.19 Constant market share analysis of export growth of bamboo etc. seats & Chairs to 17 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Bamboo/Etc Seats/Chairs		
	Due to general increase in import demand*	Due to wood product import composition	Due to increase in competitiveness
	%	%	%
AUSTRALIA	42.4	-0.1	57.7
CANADA	33.1	2.7	64.2
CHINA	55.3	0.2	-155.5
DENMARK	74.5	-81.4	-93.1
FRANCE	26.1	6.3	67.6
GERMANY	-88.6	1.3	-12.7
ITALY	796.7	-33.9	-862.8
JAPAN	1,790.4	-192.8	-1,697.6
NETHERLANDS	39.0	-87.7	-51.3
NEW ZEALAND	119.2	0.0	-19.2
RUSSIAN FED	42.1	88.1	-30.2
SPAIN	56.6	-3.8	47.1
TURKEY	-68.3	0.3	-32.0
UNTD KINGDOM	1,549.0	-52.1	-1,396.9
USA,PR,USVI	146.8	0.0	-46.8
SAUDI ARABIA	3.4	-0.3	-103.1
MALAYSIA	156.0	-2.6	-253.4

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth

Wooden furniture n.e.s.

Only one country (Australia) showed to have been responsive to Indonesia's competitiveness in exports of wooden furniture (n.e.s.). To Australia, 72.4% of Indonesia's export growth was due to increase in competitiveness, 42.4% was caused by the general increase in import demand for secondary wood products, and -14.8% impact was felt through product import composition (Table 5.20). The above was not true for other importing countries. Indo export growth to seven countries (Canada, France, Italy, Japan, the Netherlands, Russia, and Spain) was helped by product composition and general increase in import demand. In seven other countries (China, Denmark, New Zealand, the UK, USA, Saudi Arabia, and Malaysia), merely the general increase in import demand was a reason for Indo export growth.

Table 5.20 Constant market share analysis of export growth of wooden furniture n.e.s. to 17 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Wood Furniture n.e.s.		
	Due to general increase in import demand * (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	-14.8	72.4
CANADA	33.1	33.1	33.8
CHINA	55.3	-0.1	-155.1
DENMARK	74.5	-84.4	-90.2
FRANCE	26.1	52.1	21.8
GERMANY	-88.6	12.3	-23.8
ITALY	796.7	270.3	-1,167.0
JAPAN	1,790.4	235.8	-2,126.2
NETHERLANDS	39.0	34.8	-173.8
NEW ZEALAND	119.2	-37.0	17.8
RUSSIAN FED	42.1	10.7	47.2
SPAIN	56.6	48.0	-4.6
TURKEY	-68.3	3.3	-35.0
UNTD KINGDOM	1,549.0	-448.9	-1,000.1
USA,PR,USVI	146.8	-0.3	-46.5
SAUDI ARABIA	3.4	-0.3	-103.1
MALAYSIA	156.0	-9.3	-246.7

*** secondary wood products**
High competitiveness
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth

Wooden bedroom furniture

Indonesian export growth of wooden bedroom furniture in 1998-2002 was attributed to its competitiveness in Australia, Canada, and France (Table 5.21). To Australia, 59.7% of its export growth was due to increase in its competitiveness, 42.4% was due to general increase in import demand for secondary wood products, and -2.2% impact came from product import composition. Similar broad picture holds true for Canada and France.

Indonesia's export growth to China, Italy, the Netherlands, Spain, the UK, USA, and Saudi Arabia was attributed to non-competitiveness factors. The general increase in import demand was the dominant effect in Denmark, Japan, New Zealand, Russia, and Malaysia.

Table 5.21 Constant market share analysis of export growth of wooden bedroom furniture to 17 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Wood Bedroom Furniture		
	Due to general increase in import demand* (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	-2.2	59.7
CANADA	33.1	12.5	54.4
CHINA	55.3	0.1	-155.4
DENMARK	74.5	-2.8	-171.8
FRANCE	26.1	0.4	73.4
GERMANY	-88.6	0.1	-11.5
ITALY	796.7	2.0	-898.8
JAPAN	1,790.4	-446.5	-1,443.9
NETHERLANDS	39.0	0.9	-139.9
NEW ZEALAND	119.2	-2.3	-16.9
RUSSIAN FED	42.1	-1.0	58.9
SPAIN	56.6	1.9	41.5
TURKEY	-68.3	0.2	-31.8
UNTD KINGDOM	1,549.0	36.5	-1,485.5
USA,PR,USVI	146.8	12.1	-59.0
SAUDI ARABIA	3.4	0.6	-104.0
MALAYSIA	156.0	-8.3	-247.7

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth

Furniture parts

In furniture parts, Indonesia's growth in exports was attributable to competitiveness in Australia, Canada and France (Table 5.22). To these three countries, the effect of price competitiveness was greater than the total effect of import demand and product import composition. Competitiveness contributed some 57.5% to total effect in Australia, 63.4% in Canada and 79.5% in France. In contrast, Indonesian furniture parts export growth to the 15

other major importing countries was generally due to product import composition and/or general increase in import demand of the countries. The effect of price competitiveness was smaller.

In Italy and New Zealand product import composition and general increase in import demand dominated. The general increase in import demand was the primary cause of Indo exports growth in China, Denmark, Japan, the Netherlands, Spain, the UK, the USA, Saudi Arabia, and Malaysia.

Table 5.22 Constant market share analysis of export growth of furniture parts to 17 major importing countries (1998 – 2002)

Major Importing Countries	Export Growth of Furniture Parts		
	Due to general increase in import demand* (%)	Due to wood product import composition (%)	Due to increase in competitiveness (%)
AUSTRALIA	42.4	0.0	57.5
CANADA	33.1	3.5	63.4
CHINA	55.3	-0.3	-155.0
DENMARK	74.5	-20.0	-154.6
FRANCE	26.1	-5.6	79.5
GERMANY	-88.6	-0.4	-11.1
ITALY	796.7	9.2	-905.9
JAPAN	1,790.4	-212.1	-1,678.3
NETHERLANDS	39.0	-1.4	-137.6
NEW ZEALAND	119.2	0.6	-19.7
RUSSIAN FED	42.1	-4.4	62.3
SPAIN	56.6	-0.1	43.5
TURKEY	-68.3	0.9	-32.6
UNTD KINGDOM	1,549.0	-18.7	-1,430.3
USA,PR,USVI	146.8	-8.1	-38.7
SAUDI ARABIA	3.4	-1.3	-102.1
MALAYSIA	156.0	-7.6	-248.4

*** secondary wood products**
High competitiveness
Dark green: high competitiveness, enter high market growth, under high import growth
Blue: high competitiveness, enter less market growth, under high import growth
Less competitiveness
Pink: less competitiveness, enter less market growth, under high import growth
Red: less competitiveness, enter high market growth, under high import growth
Orange: less competitiveness, enter high market growth, under less import growth
Black: less competitiveness, enter less market growth, under less import growth

5.5 Substitution patterns in the world markets

5.5.1 Image of tropical wood and vulnerability to substitution

The tropical hardwood trade has been exposed to increasing environmental pressures in the recent years. Country-wise, the more alarming news tend to get over-publicized, and overshadow positive news in other places. This has perhaps accentuated the mounting of environmental concern over the degradation of the forest ecosystems and loss of biodiversity in the tropics. Sustainability of forestry and protection of biodiversity have become fundamental requirements for any timber produced and sold on environmentally sensitive export markets. Pressures from environmental NGOs have been actively channeled to affect timber trade, who in turn shape the opinions of individual consumers of wood products.

Tropical timber sector is closely monitored by several environmental NGOs, and this "surveillance" tends to intensify together with the decline in tropical forest resources (and rightly so). It appears that the international environmental lobby is not impressed by the expansion of conservation areas, but seeks to vigilantly observe their management and to bring forests left for commercial utilization under tighter environmental scrutiny. NGOs are among the public considered as strong opinion shapers and more reliable sources of environmental data than the forest authorities or industry.

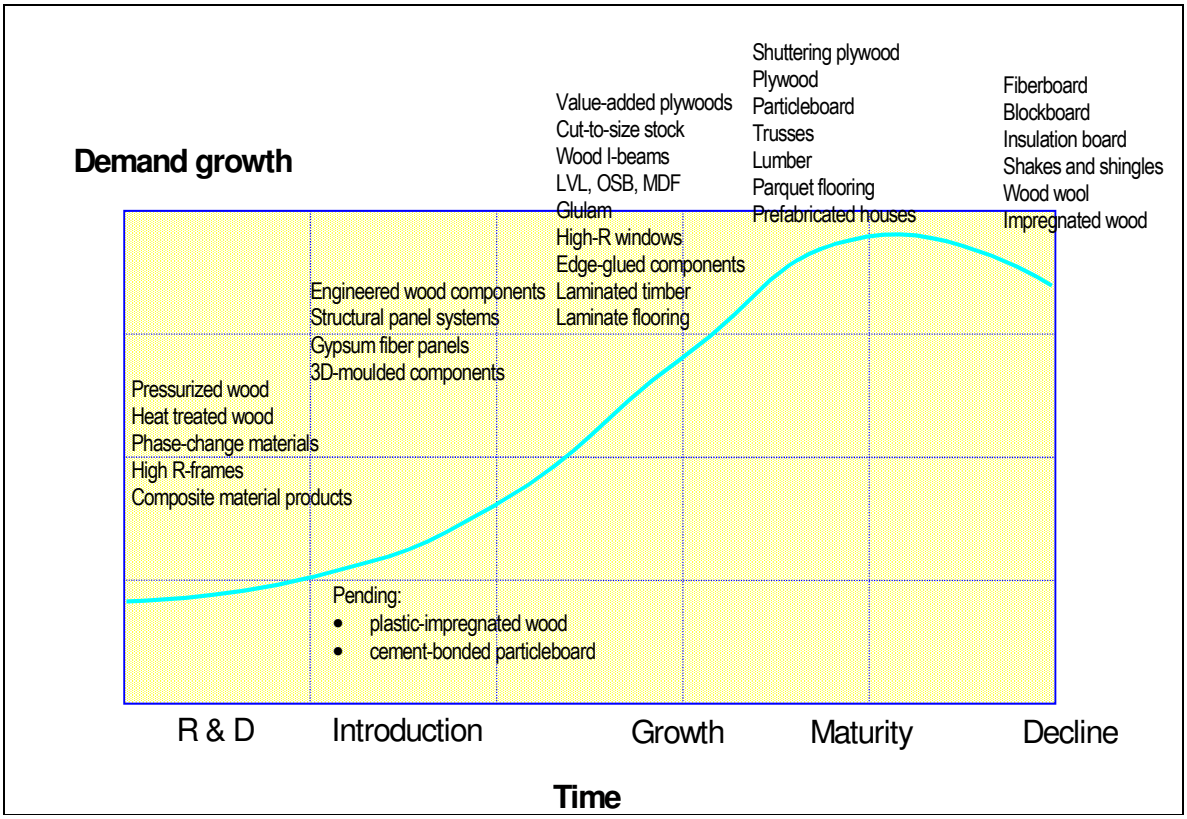
A particular threat for tropical timber products has been the well-organized lobby against timber by competitive materials industries, mainly plastics and steel industries, who are backed up by strong multinational financial interests. This lobby has attacked timber's natural merits by raising the ecologically interrupting condition of logging into the limelight, and avoiding effectively all issues rewarding the natural sustainability of a timber as a product derived of a growth process that benefits all life on Earth. In the sphere of public relations, the fragmented timber industry has not been able to fight back - in a collaborative manner - against the partly false argumentation used by the well-determined non-renewable materials suppliers. This is an unnecessary flaw, because timber ranks on top of its substitutes in terms of renewability, energy-efficiency, pollution and recycling. (Tissari, 2001)

5.5.2 Life cycle phases of competing products

As the natural forest resources have become under a tighter supply in many key producer regions (mainly Asia), product development on wood products has focused on more efficient and economic use of wood fiber. Most of the commercially successful product innovations throughout the 1980-1990s have been geared towards compensating the decline of large-diameter logs for solid wood and plywood/blockboard production. This has brought into stream engineered wood products such as LVL (laminated veneer lumber), glulam beams and I-beams. In reconstituted panels, MDF and OSB are greatly contributing to the efficiency of wood fiber usage by absorbing small-diameter logs, sawmill off-cuts, peeler cores and other processing waste, or even recycled pallets and wooden packaging as raw material.

Most of the standard mass wood products are turning into their maturity and decline unless their service life, applicability or environmental appeal is improved through R&D, processing technology development and intense promotion (Figure 5.4).

Figure 5.4 Life cycle phases of wood products



Source: Indufor Oy, 1998

So what are the options of a producer, whose product approaches the top of the curve, and risks a downward cycle? There are at least the following options to be considered:

1. Change radically raw material base, i.e. in most cases move away from natural (tropical) wood into low-cost plantation wood or imported wood, markets allowing. This strategy is actually in use by the "new" entrants from Chile, Brazil, etc., who seldom introduce any product innovations, but rather push "old" producers around the curve with lower-cost, up-to-quality-mark products.
2. Make processing and marketing improvements that result in a more efficient and profitable business, allowing the exporter to "buy more life-time" in the marketplace. This refers to the continuous improvement needs in managerial and technological fronts in order to stay competitive.
3. Invest into a new production line of a better-positioned ("younger") product, in order to pull-back into the growth phase of the curve.
4. Innovate with new products that combine e.g. two previously losing products on their own right (e.g. combining sawnwood and panels into I-beams, building components, engineered wood products, etc.).
5. Join substituting products for producing a composite material with superior performance or economy (e.g. wood-aluminium windows; the case follows in a later chapter).

5.5.3 Different facets of substitution

There are many forms of competition between wood and related materials. Tropical timbers compete between themselves, against non-tropical wood (temperate/boreal hardwoods and softwoods), fast-growing plantation timbers (rubberwood, pine, eucalyptus, acacia, etc.) and against other natural fibrous materials (bamboo, rattan, etc.). On the synthetic substitutes, plastics, aluminium and steel are among the strongest rivals to timber. On construction front, concrete, steel structures, bricks, tiles and gypsum boards add up to the list.

The patterns of substitution are product and market specific, and usually difficult to quantify because of lack of detail in statistical reporting, and increasing use of material combinations. Substitution is also influenced by effective (not always correct) promotional work and lobbying done by competitors, trade intermediaries and environmental NGOs. It appears, however, that much of the negative publicity cast over primary processed tropical wood (logs, sawnwood, plywood) in international trade does not filter through to higher value-added products. Particularly manufacturers of fine solid wood furniture of tropical species report that environmental performance of their products is much more rarely questioned by consumers or traders of these products. This would lend partial support to a notion that the export

development should focus on value added wood products instead of intermediate or primary products.

5.5.4 Species substitution: market preferences on wood species

5.5.4.1 Availability and price

The sensitivity of demand to price changes is measured by elasticity. The Fifth European Timber Trends and Prospects (ETTS, 1995) calculated price elasticities for the main forest products in five big European markets (Germany, France, the UK, Italy and Spain). In sawn hardwood, both tropical and temperate timber was concerned. The results can be summarized as follows:

- Sawn hardwood elasticities were low (varied from 0.22 to 0.82), what reflects that import demand was not particularly sensitive to price changes in the short run. Germany was the most sensitive markets, and the UK the least sensitive.
- Import price elasticities were higher than those for domestically produced products.
- Import price elasticities were higher for plywood than for sawnwood in general, and highly elastic (1.53) in Spain and Italy.

FAO (2001) presented an assessment of substitution scenarios for tropical sawnwood (Table 5.23). Comparison indicates the relevant time frames of different types of substitution effects, the likely levels of price elasticity, and the role of non-price determinants. Price will almost never be the sole criterion for substituting a species with another one, and its significance varies between types of purchasing decisions. In moving down the list of scenarios 1-7, an expanding range of cost, market and product related factors become relevant to the substitution decision. Increasing degree of uncertainty also mounts.

Table 5.23 Substitution scenarios for tropical sawnwood

Type of substitution	Time span	Short-term price elasticity of substitution*	Non-price determinants and considerations
1. Alternative supplier, same species	Weeks	High	Delivery, quality consistency, reliability (DQR)
2. Alternative tropical species (established)	Weeks/months	High	DQR + end user acceptance, long-term availability
3. Temperate hardwood species	Month/year	Medium	DQR + consumer acceptance: promotion, fashion
4. LKS	Month/year	Medium	DQR + importers invest in stock-keeping: risks grow
5. Composite wood products	Month/year	Medium/low	DQR + product design, investment, production planning changes (irreversible)
6. Added value component	Year +	Medium/low	As above: security and quality assurance of supply
7. Non-wood material	Year +	Low	As above: permanent loss of wood usage, new marketing

* % change in proportion of tropical sawnwood used per item

Source: FAO, 2001

5.5.4.2 Fashion species by end-use

It is difficult to obtain statistical data on the species breakdown of further processed tropical hardwood products because the trade nomenclature is not identifying species. Another way of approaching the preferences on species is to look at the major consumer countries and their selection of commercial species for various end-uses. The following listing has been produced to provide a broad picture on preferred species. The list is by no means comprehensive, but it gives an impression of the desired species in key applications, and is reflected in the trade of primary and secondary wood products.

USA:

- bedroom furniture: oak, cherry, pine, mahogany, stained rubberwood
- dining sets: oak, cherry, mahogany, stained rubberwood
- flooring: softwoods (southern yellow pine, cedar), hardwoods (oak, beech, maple)
- mouldings: red oak, alder, cherry, maple, poplar

Japan:

- legged furniture: oak, beech, elm, nyatoh, teak, tamo, birch, taun, Douglas fir, hemlock

- other furniture: sugi, hinoki, pine paulownia, zelkova, mulberry, maple, walnut
- interior joinery: white meranti, melapi, agathis, mersawa, spruce, Douglas fir, oak, alder
- windows: temperate softwoods and hardwoods, ash/aluminium composites,
- doors: sugi, hinoki, spruce, oak, agathis, Douglas fir, mahogany, teak
- floors for trucks: keruing, parquet: beech, oak
- picture frames: jelutong
- mouldings: domestic and imported softwoods, MDF

Germany:

- furniture: cherry, yew, beech, maple, alder, birch, pine
- windows: meranti, white seraya, framiré, sipo, sapele, iroko, limba, longhi, oak, pine, spruce, larch, hemlock, Douglas fir
- doors: meranti, beech, maple, white oak, ash, birch, framiré, sipo, sapele, iroko, limba, longhi
- parquet: numerous species, oak, beech, maple, ash, birch, rubberwood

France:

- furniture: oak, beech, ash, alder, walnut, cherry, mahogany, fruit woods
- windows: oak, pine, niangon, curupixa, tauari
- doors: oak, niangon, koto, obeche, pine, tatajuba, curupixa, afrormosia, tauari
- stairs: oak, beech, chestnut, light tropical species
- parquet: oak, beech, chestnut, numerous tropical woods, pine

UK:

- furniture: pine is very strong, oak, beech, rubberwood, mahogany, teak
- windows: softwoods, Indonesian hardwoods (meranti), afrormosia, sipo, sapele
- doors: mahogany, teak, meranti, lauan, merbau, afrormosia, sipo, sapele
- stairs: hemlock (but FSC-certified Scandinavian pine increasing)
- parquet: beech, oak, maple, pine, merbau, nyatoh, eucalyptus, bamboo flooring

5.5.4.3 Color and grain

European taste on hardwood interior materials changed towards light-color species in the 1980s, and that trend has continued ever since. It coincided with the first effective boycotts on

tropical timbers, which were mostly darker, reddish-brown species. Change in fashion came as a blessing for temperate hardwoods, and particularly those originating from the United States. American hardwoods have been able to expand their market shares in the EU during the past 15 years, and much of the market share has been gained from tropical timbers.

Light-color timbers are usually preferred on emotional or visual grounds. They are perceived more suitable for modern designs and more freely combined with metal and glass. But their use may genuinely bring some practical advantages, which are mostly related to the lighting of offices and commercial interiors. Light hardwoods reflect a large part of natural or artificial illumination back from their surface, thus widening room's dimensions and brightening up the premises.

Another feature is the distinctive grain, which is usually quite unique in each species. For instance species like ash, cherry, oak and elm have very pronounced grain patterns, which enable them to be finished to a bright lustre. On the other hand, it is more difficult to combine them with other species in wide surfaces. It is therefore essential to provide a whole range of products of the same species for architects and "specifiers" who create interior milieus. Darker timbers or those stained with darker hues can provide enrichment for the customary light color palette.

European households are generally quite conservative when it comes to the use of timbers in parquet, solid wood furniture, kitchen cabinets or other interior applications. Classic species such as oak and beech cannot be easily replaced by new look-alike substitutes. Even if lower priced, new species may not attract accustomed temperate hardwood users to switch over to them. The most recent trade shows for furniture and home decorations have hinted of a comeback of some darker hues after the long domination of lighter species.

5.5.4.4 Basic physical and mechanical properties

Species substitution is assumed to happen more easily if the mechanical properties show at least fair resemblance with the "traditional" species (cf. Figure 5.5). A detailed knowledge of these characteristics is essential in the whole production process: product design, selection of appropriate materials and tools, selection of most suitable manufacturing methods, and

recommendations on intended service (end-uses) and environmental conditions (Ozarska, 2001).

In most cases, the lower quality of plantation woods in comparison with natural species is an undeniable fact. The lower densities, growth stresses and small proportions of clear wood are some of the common stumbling blocks. A careful comparison of wood properties needs to be made, and the variability of key quality parameters understood, before attempts of further processing are made. It is usually possible to identify the nearest reference species, which plantation woods can compete with. Observed strengths and weaknesses possessed by plantation woods should be taken into account in product development. Adjusted primary processing, appropriate kiln-drying, wood engineering and manufacturing of intermediate products like edge-laminated, finger-jointed wood, can alleviate the initial quality flaws.

The technical information on those timbers, which have been traditionally used for the production of high value wood products, is generally well documented (see summaries of properties in Table 5.24 and Table 5.25). However, changing timber resources has stimulated the industry in a number of countries to search for an alternative supply of species suitable for appearance products. Traditional techniques and methods used in the manufacture of value-added wood products often have to be modified for “new” timbers to accommodate their different properties and processing characteristics.

This chapter is mainly considering the suitability of plantation woods for solid wood applications. It deserves to be mentioned that several tropical countries have already built a large-scale industry of reconstituted panels based on plantation wood. The biggest examples are Chile and Brazil, which are basing most of their particleboard, fiberboard and MDF/OSB industries on planted pine and eucalyptus. The two countries are now busily exploring the solid wood applications for their fast-growing species (based on sawnwood, veneeer, LVL, other engineered wood products). Garden furniture has been a visible segment where acacia, rubberwood and eucalyptus have substituted for teak as the “original” outdoor material.

Table 5.24 Physical and mechanical properties of selected hardwoods (1)

Property*	Austr. *E. grandis*	Iroko	Sapelli	Ramin	Meranti white	Hondur. mahog.	Europ. beech	Europ. oak
Density kg/m^3	620 950	660 ..	670 ..	660 ..	.. ..	500 ..	690 ..	690 ..
Modulus of rupture N/mm^2	122 79	90 74	110 74	134 71	81 61	83 ..	118 65	97 59
Modulus of elasticity N/mm^2	17 000 13 000	9 400 8 300	12 000 10 000	14 000 10 000	9 700 9 100	8 800 ..	13 000 9 800	10 000 8 300
Max crushing strength, N/mm^2	66 36	55 35	59 36	72 39	48 32	44 ..	56 28	52 28
Hardness (Janka) N	7 500 5 300	5 600 4 800	6 700 4 500	5 800 2 900	3 200 2 900	3 100 ..	6 400 4 300	5 500 4 700

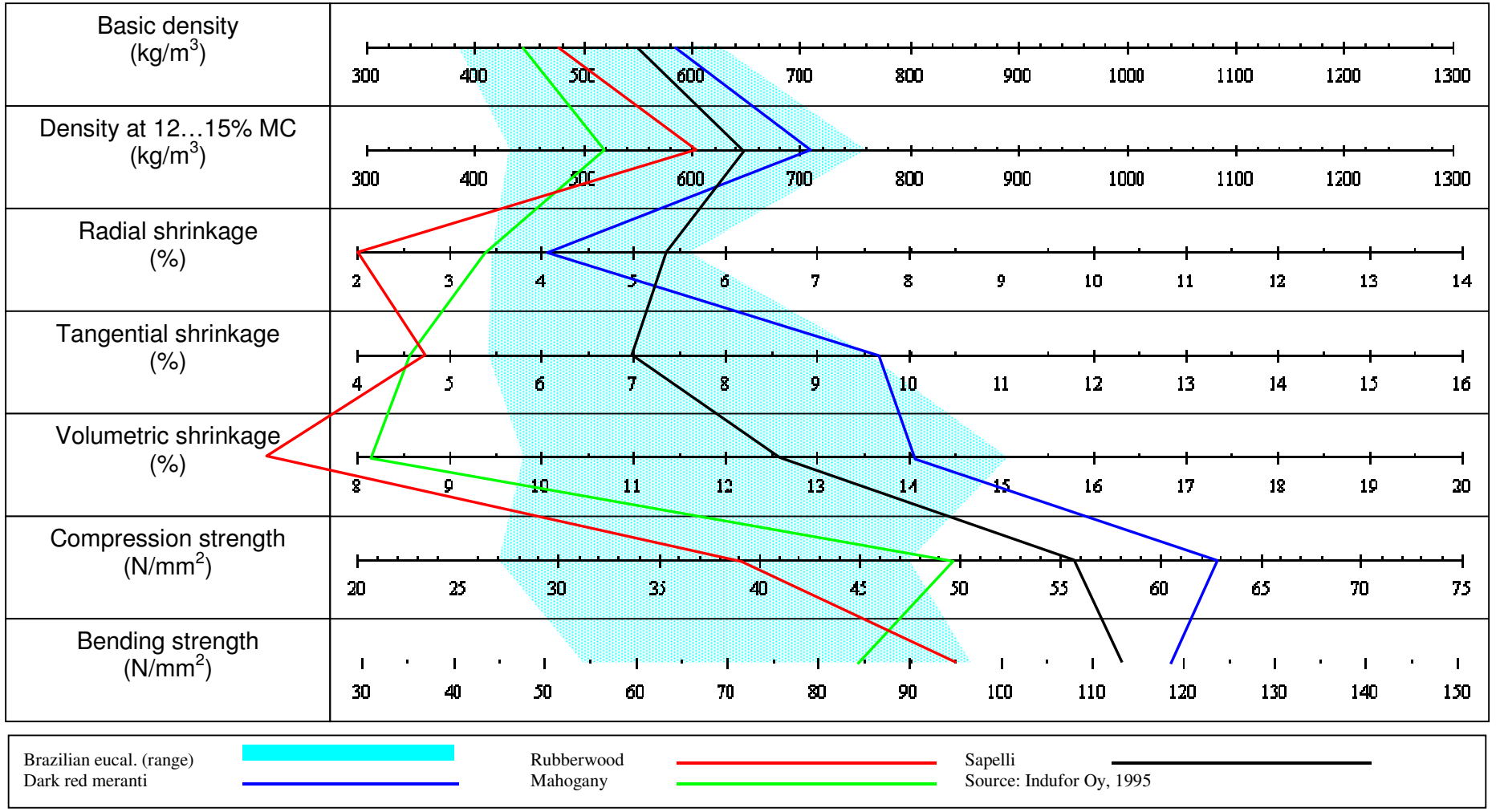
* First row values for “dry” wood; second row for “green”.
Source: Bootle (1983)

Table 5.25 Physical and mechanical properties of selected hardwoods (2)

			Birch	Dark red meranti	Beech	American red oa	Sapelli	Sipo	Mahogany	Iroko	E. globulus	Teak
Basic density	$\rho_{0,u}$	kg/m^3	535	585	575	585	550	530	445	575	550	495
Dry density	ρ_0	kg/m^3	610	670	680	660	620	590	480	630	725	535
Air-dry density	$\rho_{12...15}$	kg/m^3	650	710	720	700	650	650	520	690	750	660
Green density	ρ_u	kg/m^3	850	900	1070	1000	890	800	800	1000	1150	850
Longitudinal shrinkage	β_L	%	0.6	0.3	0.3	0.7	..	0.3	0.3	0.11	..	0.5
Radial shrinkage	β_R	%	5.3	4.1	5.8	4	5.4	5	3.4	3.8	9.8	2.6
Tangential shrinkage	β_T	%	7.8	9.7	11.8	8.2	7	7.9	4.6	5.5	20.6	5
Volumetric shrinkage	β_V	%	14	14.1	17.9	13.1	12.6	11.8	8.2	10	32.4	8.2
Compression strength	F_c	MPa	51	63	62	50	56	58	50	69	44	50
Bending strength	F_b	MPa	147	119	123	110	114	99	85	110	90	83
Tensile strength	$F_{t\parallel}$	MPa	137	146	135	163	88	110	..	79	90	120
Tensile strength	$F_{t\perp}$	MPa	7	2.7	8.9	5.5	2.5	2.3	3.8	2.5	7.5	3.8
Modulus of elasticity	E	GPa	15.5	14.5	16	12.5	10	11.5	9.1	11.4	12.2	11.4

Source: Holzatlas (1974)

Figure 5.5 Comparative physical and mechanical properties of eucalyptus, rubberwood and tropical hardwoods



5.5.5 Introduction of lesser-used species

Tropical countries themselves would benefit from substituting lesser-known species (LKS) for traditional tropical woods that are becoming scarce. The logistical problem is their varied occurrence and processing properties. It is generally difficult to "batch" different species together for drying and processing. Some new research is being done e.g. in Malaysia to develop machine (non-destructive) strength grading for mixed tropical hardwoods. A new heat-treatment technique (first developed in Finland) has been experimented to dry batches of mixed Malaysian tropical timbers in a single kiln session with promising results. Once these obstacles can be lowered, the adoption of LKS to end-use applications would be eased.

In a survey carried out among the US importers and wholesalers, the following factors were rated at the highest when introducing lesser-known species from a tropical country (LKS):

1. Availability of reliable supply of species
2. Availability of technical and promotional material
3. Availability of small trial volumes for testing
4. Low trial price
5. Acceptance of the LKS by an influential firm
6. Risk-free trial period
7. Certification of the LKS

Within the European Union, the Netherlands has taken a prominent position in testing and launching lesser-known tropical species to match the market needs in applications where visual appearance of wood is not the primary selection criteria. Experiences obtained so far indicate a few simple lessons to be learned:

1. Seek to establish partnerships in the consuming countries with players who have commercial interests to diversify selection of imported woods,
2. Let them carry out the appropriate testing and matching to end-uses as early as possible,
3. Adjust your processing industry to meet the quality requirements in the established niches,
4. Enter into applications where the LKSs can serve their functional purpose and substitute a higher-value timber, which can gain a higher revenue in another use,
5. Take full advantage of timber certification as a promotional tool.

The potential offered by substitution through LKS should not be overestimated. It has to be remembered that basic qualities like color, machineability, range of end uses, price and availability still essentially dictate the position of the species and its potential to gain market from other species. There are certain classic timbers, which have established such a firm foothold in the marketplace, that they cannot be replaced for other reasons than scarcity of their supply, which is reflected in their prices. Trade in certified wood products can provide additional market push for LKS, but not without a proper match of desired qualities and price range to the market expectations.

Malaysian rubberwood progress since the late 1980s was partly based on the necessity of finding a substitute for the dwindling supply of ramin in the country. Unfortunately for Indonesia, the country does not possess a similar option now that ramin is of shorter supply also there. Currently ramin is placed on the CITES list so trade is at a halt. Rubberwood plantations are much more scattered in Indonesia, rendering them uneconomic for large-scale utilization.

5.5.6 Substitution by reconstituted panels for wood: case of laminate flooring

Laminate flooring started its strong expansion in the mid-1990s, and has since then shown phenomenal growth, particularly in Western Europe. In 1995, laminate flooring reached production of just 55 mill. m^2, compared to 260 mill. m^2 of traditional parquet flooring (comprising solid wood parquet, multi-ply parquet and mosaic parquet). In the following five years, laminate flooring outpaced parquet by impressive margins, recording around 360 mill. m^2 global output, just on top of parquet (around 345 mill. m^2).

Around 300 mill. m^2 (82%) of total laminate flooring output was concentrated in Europe, and Germany alone accounted for 43% of the global output. Around 250 mill. m^2 of laminate flooring were consumed in Europe, while the remaining share of output was exported to other main markets, the Americas and Asia, both of which consumed around 57 mill. m^2 in 2000. Particularly China's imports of this product are on the rise.

Due to the differences in housing culture and climate, Western Europe has a differentiated pattern of flooring materials use. Textile carpets still have a leading position in many Central European countries, while vinyl flooring holds big market shares in Scandinavia. In Southern Europe, more ceramic tiles are used than elsewhere in the continent.

Between 1996 and 2000, laminate flooring has gained strongly in popularity (Table 5.26). It has passed wood in popularity and represents around 6% of the floor coverings today.

Table 5.26 Market shares of flooring materials in Western Europe 1996-2000

Material	Market Share (%)	
	1996	**2000**
Textile	57.3	55.0
Stone/ceramics	13.6	13.8
Vinyl	16.0	15.5
Wood	5.1	5.3
Laminate	3.6	5.9
Linoleum	2.0	2.2
Others	2.4	2.3
Total	**100.0**	**100.0**

Source: European Panel Federation

It appears that laminate flooring has replaced mainly textiles and vinyl in the consumption of covering materials. Several reasons for its success can be cited. Dimensional accuracy, strong branding of flooring ranges, wider varieties of patterns textures and more recently, sound-proof and glue-free laying techniques are some of the key propellers of success. Increasingly, laminate flooring is promoted as a healthy replacement material for carpets, equally on grounds of its anti-allergenic, low formaldehyde and fire retardancy properties. Last but not least, the producers have early reached advantages of scale what has resulted in very competitive prices.

Tropical wood in the form of parquet has mostly remained on the losing ground in the competition with laminate flooring. Besides, nearly all the solid wood (veneer, plywood) has lost out to composites in the core construction (base/substrate) of laminate flooring. A minor share of HDF/MDF laminate flooring uses, however, real tropical/temperate hardwood veneers to achieve a natural appearance. It was estimated that this niche was about 26 mill. m^2 or 7% of all laminate flooring produced worldwide in 2000. It is constructed of a 6-8 mm

HDF substrate, a 0.3 mm veneer and insulator, UV-sealers and anti-scratch top-coats. The product sells as high-resistant "wood floor" or "veneer floor", even though it is essentially laminate flooring.

Another blessing-in-disguise for tropical wood parquet results from the powerful promotion done by laminate flooring manufacturers. One should remember that laminate flooring business is concentrated on very few large groups (usually leading MDF/HDF producers), unlike the more fragmented (tropical) parquet industry. The top-5 producers had 53% of the global laminate flooring market in 2000. Their resources for efficient marketing campaigns are huge compared to parquet makers. But as the promotional arguments for a healthy, naturally-looking flooring support both products, parquet and other timber floorings have to a certain degree benefited from the work done by laminate flooring industry.

5.5.7 Agents for substitution: surface materials

5.5.7.1 Global scale of surface materials

Several types of paper, plastic and other surface materials have been developed to overlay timber and non-timber panel products. These overlays are now very similar to "real wood" and pose competition to tropical and other timbers in many applications. Global demand for panel surfacing materials exceeds 10 bill. m^2 and has been growing on average 6% per year in the 1990s. Those overlays that mimic wood are constantly the favored ones in the consumption, indicating that even synthetic substitutes for wood benefit from wood's natural appearance.

Europe is the largest and most mature marketplace for surface materials, covering around 43% of global demand for surface materials. Its large-scale particleboard, fiberboard and MDF industries have sought to provide cost-efficient solutions for furniture and joinery industries in the mass markets of low and mid-range furniture and interior decoration. Asia-Pacific consumes 29% of global demand for surface materials, followed by North America (17%) and Latin America (6%).

5.5.7.2 Life cycle phases of panel surface materials

In terms of their end-use applications, growth prospects and life cycle phases, the various surfacing materials display different patterns. As they supply very dynamic end-user industries, competitive positions between materials can change rather swiftly.

Trends are the following (Wood Based Panels International, 2001):

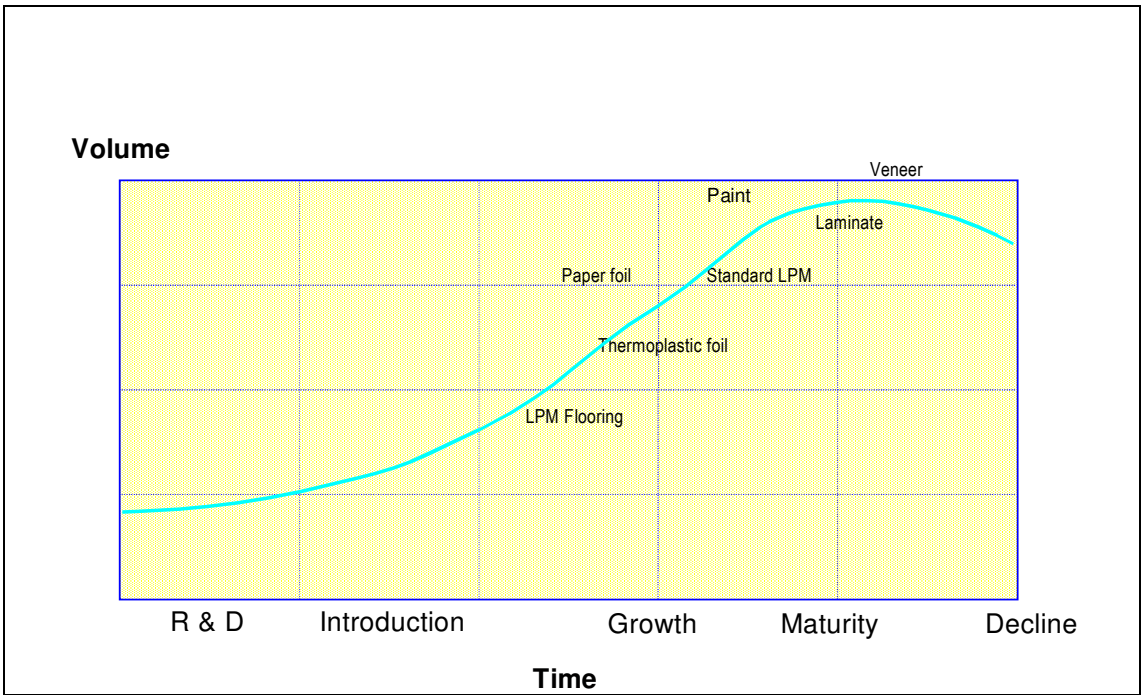
- Globally, low-pressure melamine (LPM) is the most widely applied surface material.
- LPM and paper foils have enjoyed fast growth in Europe, spurred by advancing of MDF and particleboard uses in the mass-production segments: furniture, construction and laminate flooring. Veneer is losing ground in furniture surfaces to paper foils and thermoplastics.
- Low basis weight paper (LBWP) and veneer are the most widely applied surfaces in the Americas and in Asia.
- Pre-impregnated paper foils have grown faster than post-impregnated paper foils.
- PVC foil overlays may begin to lose ground to powder coating finishes due to cost and environmental reasons. 3-D PVC thermoplastic foils are, however important for furniture fronts.
- The use of traditional high-pressure laminate (HPL) has matured in Europe, while continuous pressure laminates (CPL) and low-pressure laminates (LPL) have increased in popularity.
- The life span of decorative patterns and finishes is getting shorter as fashion cycles accelerate.

The flooring and furniture industries are increasing the use of particleboard and MDF with overlays. The wider adoption of modern surface materials with maximum design variety strengthens MDF's substitution over solid wood products. Solid wood tends to become under immediate threat from MDF. In the field of wood-based panels, hardboard for doors skins and wall partitions is under attack by thin MDF and particleboard, and the nascent OSB industry in Brazil is set to compete with plywood in construction and packaging segments.

Importantly, the substitution pressure on solid tropical wood that originates from the international markets, can be put very efficiently to consume plantation-based panel products, if it attempts to move into downstream processing with more value added products. A good case on this is the introduction of laminate flooring into Brazil, which was imported – in order

to make consumers acquainted with the product - by the same firms that later on opened the first mills to produce it locally. (Tissari, 2001)

Figure 5.6 Life cycle phases of panel surface materials



Source: Wood Based Panels International, 2001

5.5.8 Rise of composite materials

There are several emerging composite products that are still in their early phases of research and development. These can later on incorporate lesser-known species, wood waste or fast-growing plantation wood – thus relieving the pressure on natural tropical wood. Some examples are below.

1. Wood fiber composite: composed of wood fiber and synthetic fiber, the product is easily shaped by moulding press and could be used as doors skins
2. Bio-composite boards – extracted from oil palm residues, coconut shells or flattened bamboo
3. Wood-plastic composites: composed by wood powder and recycled plastic, and could be used as material for moulded products
4. Wood-glass, wood-iron combinations are now in greater demand due to their original and preeminent design, and easy maintenance and practical function.

Product development should take into account the optimization of properties of plantation wood and synthetic materials to come up with unique product qualities and possible material cost savings.

Text Box 1 Case study of window material competition in the UK

Back in the early 1970s, aluminium and later on in 1980s PVC took control of the UK window market because they were sold as systems, backed with appropriate service and showing good standardization and low maintenance needs. Frequently, the synthetic window units came with double-glazing in convenient thickness, what was out of reach in the more robust wooden windows. Wooden windows suppliers focused too strictly on high joinery skills and left marketing and selling arguments to the hands of competitors.

Today, the UK window market consists of around 13 mill. units consumed per year (2001). PVC holds 56% of the market, wood 23%, aluminium & steel 21%. PVC windows have been on the market for 20 years. They were initiated and promoted heavily for the replacement market, and have since then reached a dominant position. Main arguments against wood were the short service life, need for frequent repairs and painting, and resulting high cost of maintenance. Much of that bad reputation was in fact caused by the careless handling and storing of frames in the building sites, and due to glazing done on site – instead of fully finishing and glazing the units in factories. The UK wood windows industry has since late 1990s taken a decisive action to gain market shares back from PVC. Some of the measures taken are discussed below.

1. British Woodworking Federation has launched a Timber Window Accreditation Scheme, aiming at re-establishing consumer trust on wooden windows. It has established a strict quality label, which guarantees that its accredited members meet a set of manufacturing and performance standards. Aim is at a 15 years guaranteed maintenance-free service life.
2. Introduction of total solutions concept: wooden windows are sold with (i) core product, (ii) service and (iii) utility. Total quality management (customer-focused) supports this strategy.
3. Technological advances: increasing use of laminated windows that swell less, and use of microporous coatings, which allow wood to "breathe", i.e. change its moisture content according to weather conditions. Better security and thermal insulation properties are being sought.
4. A small but growing niche is wood+aluminium windows. Based on the optimization of desired properties of both materials, aluminium-clad wooden window units have been developed. In exterior side, aluminium provides the stability, weather resistance and care-free service life, while wood in the interior transforms into a home decoration piece with design advantage and warm appearance. Mechanically jointed together, the wood and aluminium pieces of the frame can be easily dismantled for service and repair.
5. Use of life cycle analysis (LCA). Research has shown that during the life cycle of windows, most of its environmental impacts are caused by leakage of energy. Manufacturing and finishing costs are only negligible (2-4%) of the total environmental effect. Wood-aluminium windows have proven the most environmentally benign in this respect. Both materials also recycle well.
6. Use of mass media and even TV-commercials to educate consumers on wood's benefits in high-quality window systems.

As a result of these efforts taken, the quality image and environmental status of wooden windows has been elevated in the UK. The industry is today confident of winning back half of the new buildings market from substitutes in three years, and to reach half of the total market (including replacements) by 2010. Even unexpected backers have emerged: Greenpeace, usually rather anti-timber environmental NGO, has pledged open support to timber windows over PVC, based on timbers' superior environmental performance when supplied with appropriate forest certification.

Source. TTJ Timber Trades Journal (various issues), The European Window Markets, Euro Windoor (2001)

5.5.9 Substitution by synthetic materials for wood: case of wooden windows

The case presented in Text Box 1 examines the evolution of windows markets in the UK.

5.5.10 Indonesia's experiences

For Indonesian plywood industry, APKINDO reported the most pressures coming from MDF (drawer backs), OSB, softwood plywood (structural plywood), and gypsum panels for ceilings. In Japan, packaging plywood has been losing ground to OSB.

Competition has overall become stiffer, and new products like LVL (laminated veneer lumber), waferboard, reconstituted boards, etc. threaten hardwood plywood and solid wood more than ever. Import pressures are also felt in the domestic market (caused by China and Malaysia). Around 40-45% of Indonesia's domestic plywood consumption is purportedly met by foreign supply. European and US branded furniture dominate the high-end segment of the furniture market in the largest cities of Indonesia. Wood industry's investments to MDF, secondary processing, engineered wood products, etc. have been postponed indefinitely. Some of the best companies have 80% of output in secondary products such as film and phenolic faced & fancy plywoods, but variety is large between enterprises. Once plantation timbers become better available, investments may (should) resume in Indonesia. Now it is the survival of the fittest: of the 115 plywood mills 22 or more mills have closed, 34 have reduced production in 2003 (APKINDO interview, Oct. 2003).

Environmental image of the industry is a stronger competition factor than before, and it may lead into shifts from one supplier to another. Quite recently, some of the leading tropical timber product importers in the UK have switched from Indonesian products into Malaysian ones. The reason cited was the lack of Indonesian certified wood; a condition that Malaysia was able to fulfil.

5.6 Price trends in the world markets

5.6.1 Data sources

Pricing of timber species and wood products made thereof are tangibly affecting consumption patterns in the world markets, and can catalyze substitution. The following sections compile some price trends by product groups, mainly from the ITTO and other secondary sources. The project work schedule did not allow collection of primary (first-hand) price data or fieldwork. Due to the global nature of the market analysis, this was not even realistically planned for.

The coming sections will complement the data on average CIF prices calculated on the import side based on COMTRADE statistics.

5.6.2 Sawn hardwood

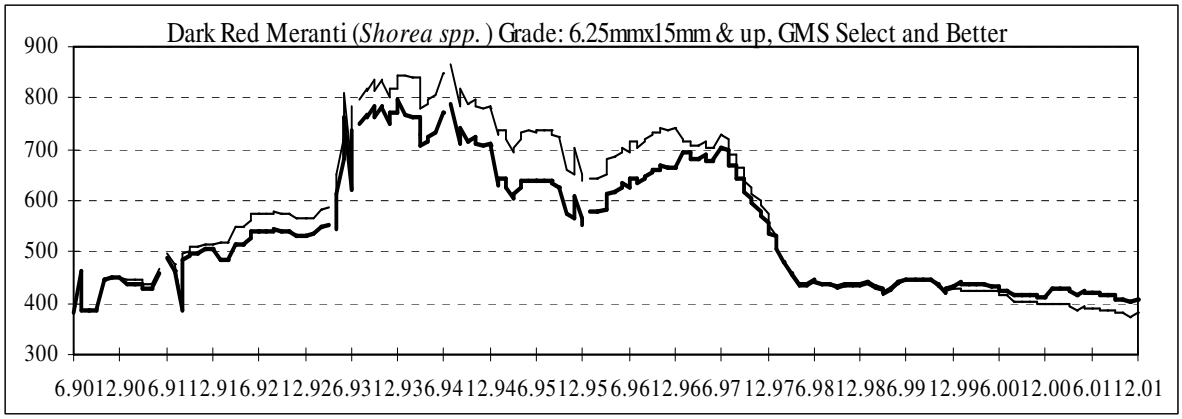
Due to the scarcity and quality of Indonesian price data, some long-term series are presented here from ITTO data on Malaysia's sawnwood exports. These are complemented with domestic market prices from both Indonesia and Malaysia.

Bold lines show FOB prices in constant 1990 US$ per cubic meter, deflated by using the G-5 MUV Index used by the World Bank for deriving real commodity prices. Normal lines show nominal FOB price trends. All grades are kiln-dried.

Malaysian sawn meranti's sliding export price performance since early-1990s, and further on its steep decline during the second half of 1997, is illustrating well the harsh recent realities of tropical commodity pricing (Figure 5.7). A new equilibrium price appears to have been set on a clearly lower level in the late 1990s and early 2000s. Nearly 50% of the price has been lost in just 5-6 years. Even though the devaluation of local currencies has served as a buffer to soften the financial impact to exporters, the development shown no signs of a vigorous recovery. Some signs of firming prices are, however, available from ITTO data later in 2002-2003. Nominal price had recovered to around USD 470/m^3 by the end of 2002.

In terms of domestic prices, Indonesian and Malaysian prices are difficult to compare even from ITTO data, because different species are reported (Table 5.27), and no reliable ITTO data is available for Indo exports either (Table 5.28).

Figure 5.7 Half-a-year export prices of meranti sawnwood from Malaysia (USD/m^3 FOB)



Note: bold line: constant (1990) price, normal line: nominal price
Source: ITTO, 2002

Table 5.27 Domestic prices of selected wood products in Indonesia and Malaysia

Indonesia	USD/m^3	USD/m^3	Peninsular Malaysia	USD/m^3	USD/m^3
Plywood Logs	Price ranges		**Logs (SQ ex-logyard)**	Price ranges	
Face	65-76	65-76	DR Meranti	175-180	170-180
Core	40-51	50-60	Balau	175-180	180-185
Sawlogs			Merbau	220-225	205-210
Meranti	65-80	65-80	Peeler Core Logs	70-80	85-90
Falkata	80-90	85-95	Rubberwood	48-50	48-50
Rubberwood	49-50	52-53	Keruing	130-135	165-170
Pine	65-75	75-80			
Mahoni	495-500	480-490			
Sawnwood			**Malaysia**		
	Ex-mill		**Sawnwood**		
Domestic Construction			Balau (25&50mm, 100+mm		
Kampar			Kempas (50cmx 75,100 +125 mm	225-235	225-235
AD (6x12-15x400cm)	215-226	205-220	Red Meranti (22,25& 30mm x 180+mm	150-155	155-165
KD	290-300	290-300	Rubberwood Boards (25mm&50mm	220-225	220-230
AD (3x20xs400 cm)	300-310	305-310	(50-75mm sq)	185-190	185-195
KD	315-325	325-330	(75+ mm sq)	195-200	200-210
Keruing				210-215	
AD (6x12-15x400 cm)	205-210	215-220			
AD (2x20x400 cm)	210-220	220-230			
AD (3x30x400 cm)	220-230	220-235			
Plywood (Jakarta)			**Malaysia**		
9mm		205-220	**Plywood**		
12mm		170-185	3.6mm		215-230
18mm		165-175	12-18mm		175-185
Particleboard			**Particleboard**		
9mm		140-150	6mm & Above		130-150
12-15mm		135-139			
18mm		125-135			
MDF			**MDF**		
12-18mm		145-165	12-18mm		165-175

Source: ITTO Market Report, 16-31 March 2003, extracted by T. Waggener

Table 5.28 Export prices of selected wood products in Indonesia and Malaysia

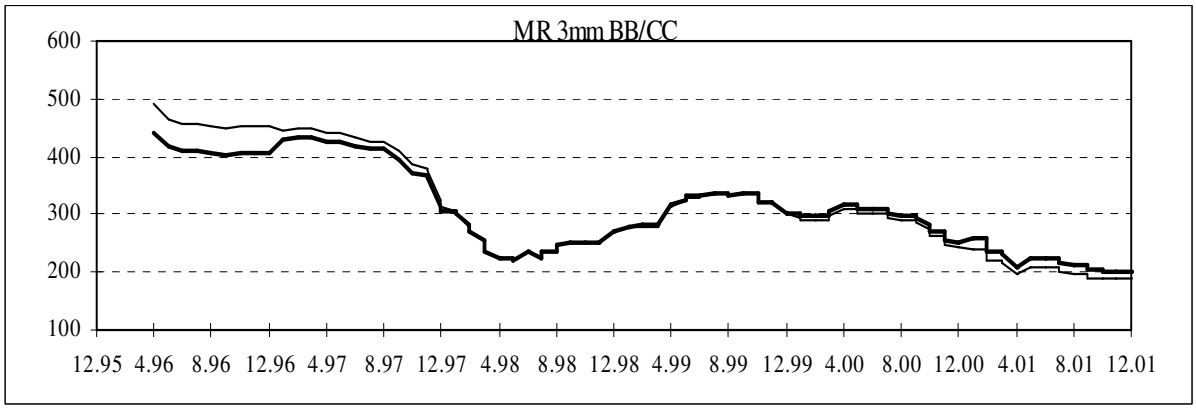
Indonesia	Export (FOB)	Peninsular Malaysia	Export (FOB)	
	USD/m^3	**Sawn Timber**	Price ranges USD/m^3	
Plywood & Veneer		White Meranti A&up	290-295	285-290
MR, Grade BB/CC		Seraya Scantlings (75x125 KD)	510-520	500-510
2.7mm	235-246	Sepetir Boards	190-200	185-195
3.0mm	200-210	K.Sesendok (25, 50 mm)	285-295	290-300
6.0mm	155-160	Merbau (75mmx125mm)	505-515	
Particleboard		**Plywood & Veneer**		
9-18mmFOB	115-130	MR, Grade BB/CC		
MDF Export (FOB)		2.7mm		245-255
12-18mm	120-135	3.0mm		205-215
Value-Added Products		9.0mm		165-170
Mouldings		**Particleboard**		
Laminated Boards		6mm & Above		135-145
Falkata wood	275-290	**MDF**		
		15-19mm		155-165
Red Meranti Mouldings		**Value-Added Products**		
(11x68/92mm x 7ft up)		Mouldings		
Grade A	515-525	Selangan Batu Decking		520-535
Grade B	430-440	Laminated Scantlings		
		72mmx86mm		465-475
		Grade A		595-615

Source: ITTO Market Report, 16-31 March 2003, extracted by T. Waggener

5.6.3 Plywood

Tropical plywood export prices have been in a roller-coaster path since mid-1990s (Figure 5.8). The standard 3 mm ply (a common benchmark grade) lost 50% of its 1997 quotation by end-2001. During 2002, price went up gradually, but then rolled back on the 4th quarter (not shown below).

Figure 5.8 Four-month export prices of 3 mm plywood from Indonesia (USD/m^3 FOB)



Note: bold line: constant (1990) price, normal line: nominal price
Source: APKINDO export statistics (2003)

According to interview with APKINDO in October 2003, quotations of foreign buyers (USD 230-240/m^3 at the time) for ordinary plywood meant that prices were below actual production costs. A closer look at APKINDO's export statistics (Table 5.29) reveals that the ordinary plywood still dominates exports, despite the frequently mentioned attempts to add more value to the products through special overlays, etc. The price premiums that the secondary processed plywood fetched tend to be different in different markets. In best cases, secondary processed plywood brought back home 130% (ASEAN) or 78% (North America) premiums against ordinary plywood. On the opposite, prices were nearly the same in exports to China or to Taiwan.

Table 5.29 Export prices of secondary processed plywood by APKINDO in 2002

Countries	All plywood	Secondary processed	Price
	USD/m3 FOB	USD/m^3 FOB	Premium%
US, Can, Mex	318	566	78
UK/Ire	284	404	42
Europe continental	343	431	25
China	328	342	4
Hong Kong	229	403	76
Taiwan	206	234	14
S:pore	234	319	37
Other ASEAN	159	366	130
Middle East trad.	259	312	21
Other Middle East	228	278	22
Japan	296	363	23
Other	231	368	59
Total	**282**	**382**	**35**

Source: APKINDO export statistics (2003)

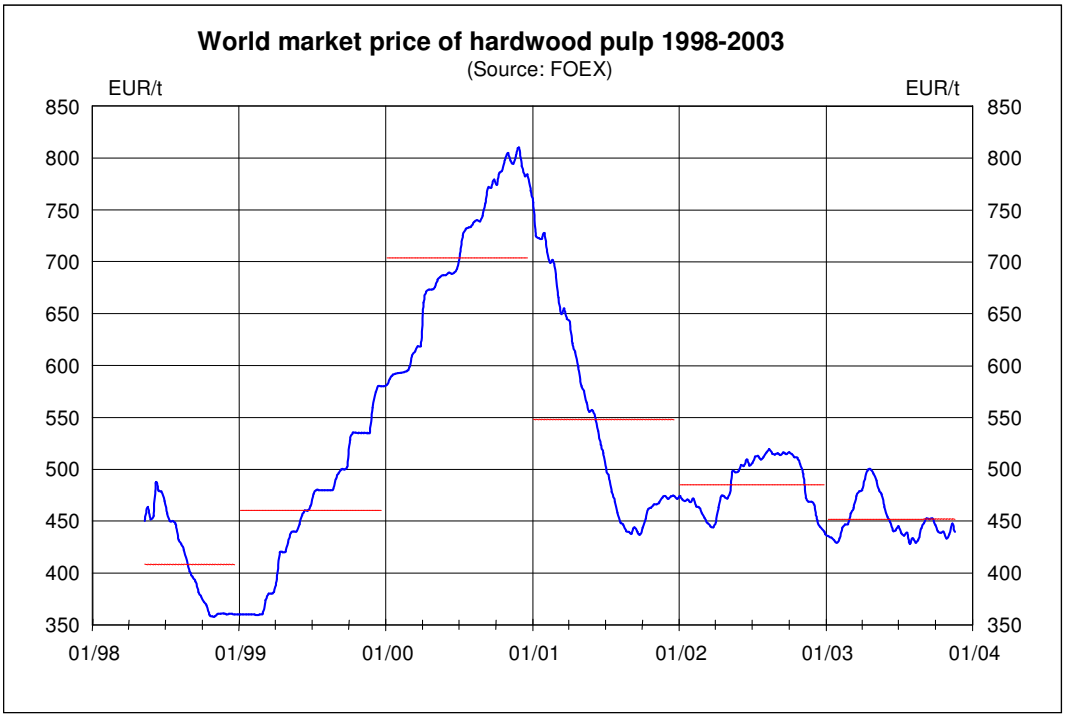
In the late-2003, the Japanese yen strengthened to the level of 109,6 per USD, which created stronger demand for Indonesian plywood in that market. Resulting price rises in the range of USD 5-10/m^3 were passed, as were the USD 2-3/m3 freight increases that affect CNF price levels of the contracts. In Hong Kong and China, the freight rises were smaller USD 1-2/m^3. Substantial freight increases were recorded to the Middle East (USD 10/m^3), to the EU (USD 15/m^3), and to the US in particular (USD 20-25/m^3). China's increasing demand for large vessels to ship iron ore and steel is the main reason for freight rates shooting upwards. Vessel charter fees went reportedly up from USD 10,000 per day to USD 20,000 per day during

2003, and the upward spiral has continued in the first quarter of 2004. As Indonesia sells plywood on CNF basis, effects are felt immediately on FOB prices.

5.6.4 Wood pulp

Pulp demand is derived demand, driven by printed media trends and advertising levels. Prices tend to be determined under influence of economic activity in one hand, and stocking levels on the other hand. Global pulp markets are widely cyclical (Figure 5.9) and the prices tend to be determined under influence of economic activity in one hand, and stocking levels on the other hand. Pulp demand is derived demand by nature. The global benchmark for producer stock levels (known as NORSCAN stocks) is closely monitored indicator of price movements: if stocks fall below 1,5 mill. tons, prospects for rising prices are good. Hardwood pulp (short-fiber) has been priced slightly lower than softwood pulp (long-fiber) and the hardwood side has suffered more from over-capacity and price volatility. Moreover, Indonesia's main export grade, known as mixed (tropical) hardwood pulp (MHP) is priced below high-quality eucalyptus pulps produced of fast-growing plantation wood.

Figure 5.9 World market price trend for chemical hardwood pulp



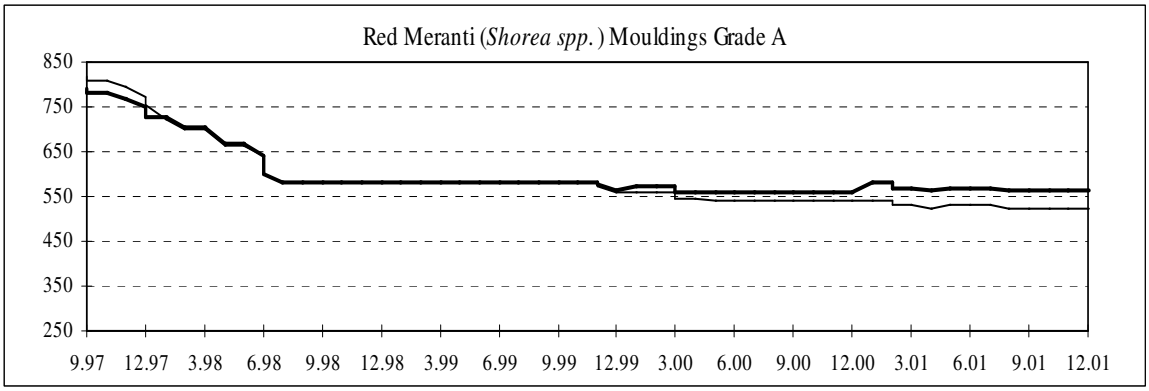
Note: blue line: weekly price, red levels: yearly averages

5.6.5 Further processed wood products

5.6.5.1 Profiled hardwood

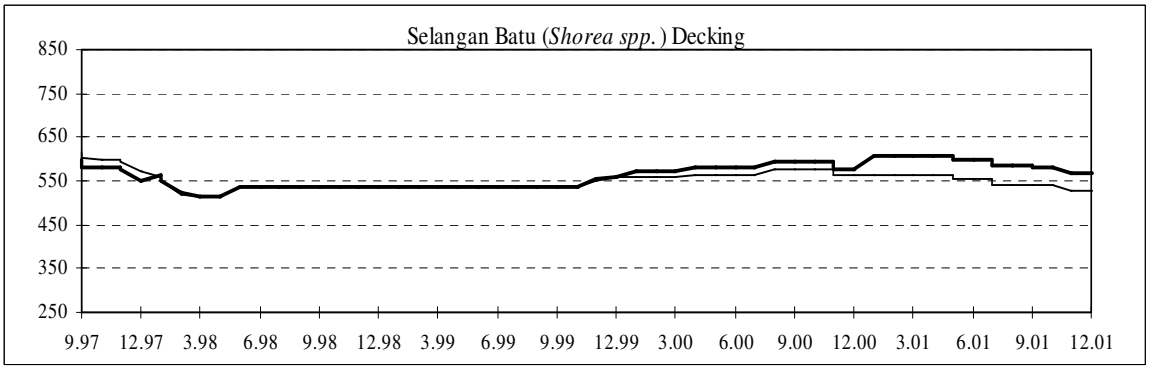
In Figure 5.10 bold lines show prices in constant 1990 US$ per cubic meter (deflated by the G-5 MUV Index used by the World Bank for deriving real commodity prices). Normal lines show nominal price trends. All prices are FOB, Indonesia. During the build-up of the Asian economic crisis in 1997, the prices were brutally corrected downwards from USD 800/m^3 to around USD 580/m^3. Thereafter the lower new price level has held firm. More recent indications from 2002 and 2003 are showing new gains in mouldings prices of meranti. Due to globally moderate levels of inflation, the spread between nominal and constant price curves is small. Price trend for decking, the fastest-growing end-use sector for profiled wood, has been more positive, showing less variation over the period 1997-2001, and strengthening prices since Q4/1999 (Figure 5.11).

Figure 5.10 Quarterly export prices of meranti mouldings from Indonesia (USD/m^3 FOB)



Note: bold line: constant (1990) price, normal line: nominal price
Source: ITTO, 2002

Figure 5.11 Quarterly export prices of selangan batu decking from Indonesia (USD/m^3 FOB)



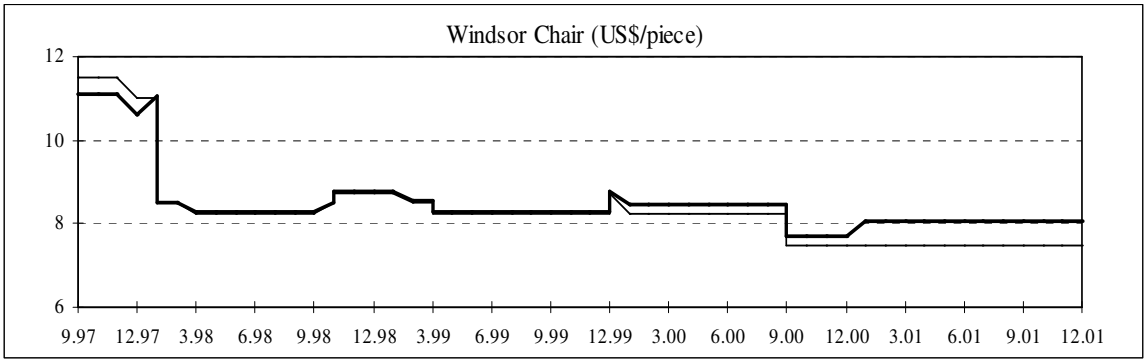
Note: bold line: constant (1990) price, normal line: nominal price
Source: ITTO, 2002

5.6.5.2 Furniture and parts

Although in general the move towards further processed wood products has been warranted for its numerous benefits for the wood sector and economy, it deserves to pay attention to associated risks, too. There are wide differences on the level of advancement and uniqueness of the products, and this reflects on prices fetched. The highest price points are obtainable only for products that show a fair amount of quality and design consciousness. On the contrary, many Asian countries are currently expanding their furniture-making by serving as contract manufacturing bases for Western out-sourcing ventures, who assemble, finish and market the final product in their own markets for healthy margins. This means that the contract manufacturers can be easily changed on the basis of comparative cost competitiveness.

While the more lucrative markets may allure new countries to race for further processed wood products for exports, there is a risk of falling into a cycle of growth without prosperity. As new countries enter into export business, their competitiveness depends most often on lowering production costs and product prices against immediate regional rivals, instead of real product and process-related strengths like better materials, operational efficiencies, total quality or enhanced design and marketing. This has already been well demonstrated in wooden chairs, for example, where the production cost of a rubberwood Windsor style chair has fallen from around $11,50/piece in 1997 to approximately $7,50 in 2001 in Malaysia, and has fallen below $5 in Vietnam! Bold lines in Figure 5.12 show again prices in constant 1990 US$, and normal lines show nominal price trends.

Figure 5.12 Quarterly export prices of rubberwood Windsor chairs from Malaysia (USD/m^3 FOB)

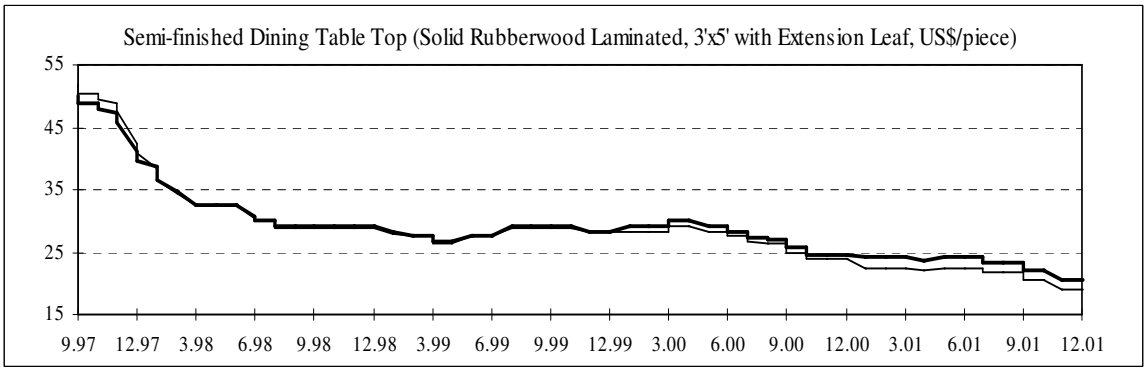


Note: bold line: constant (1990) price, normal line: nominal price
Source: ITTO, 2002

The price trends do look bleak for dining table tops, too. Laminated rubberwood table top (semi-finished) has fallen from USD 50/piece in 1997 to USD 20/piece in end-2001 (Figure 5.13). Top grade table tops fetched USD 650/m^3 in 1999, but only USD 490/m^3 in end-2001 (Figure 5.14).

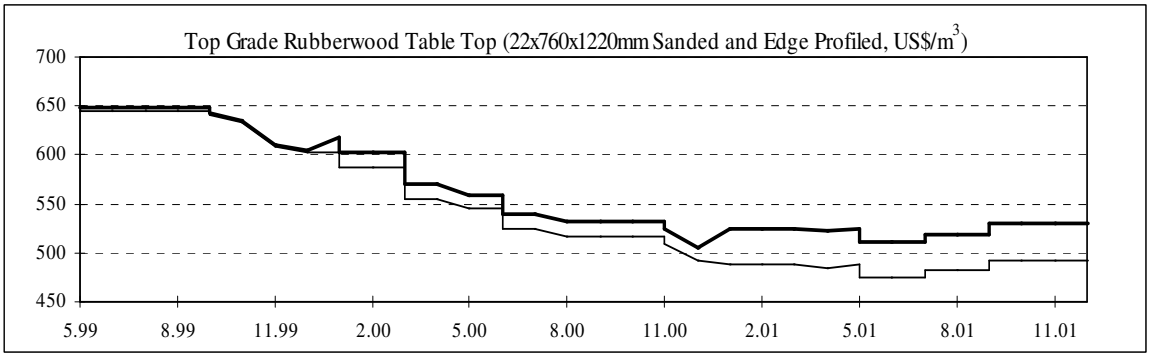
For all the above mentioned furniture items, the 2002 offered some price recovery, but generally a flat trend persisted that year (ITTO, 2002).

Figure 5.13 Quarterly export prices of semi-finished rubberwood dining table top from Malaysia (USD/m^3 FOB)



Note: bold line: constant (1990) price, normal line: nominal price
Source: ITTO, 2002

Figure 5.14 Quarterly export prices of semi-finished rubberwood dining table top from Malaysia (USD/m^3 FOB)



Note: bold line: constant (1990) price, normal line: nominal price
Source: ITTO, 2002

6 EXPORT TAXES AND RELATED NATIONAL POLICIES INFLUENCING INDONESIAN WOOD PRODUCTS TRADE

6.1 Introduction

Export taxes can be used as a fiscal and policy tool to guide export development and enable industry restructuring. In the case of Indonesia, higher export taxes on primary processed products have been hoped to induce the wood industry to invest in further processing and consequently, to export more value-added products. In developing countries such as Indonesia, the implementation of export tax policy generally relates to broader policy options, which are suitable to the priority of the development of the countries themselves. They may be erected to provide support for the development of "infant" industries. The aim is plausible as such, but the support measure may distort the markets. This part of the study was based on experiences from such policies and on a simulation of trade impacts of such decisions on industry and revenue flows. The study examined the effect of tax policy on the performance of logging and wood processing industries. It tried to find out the level of tax, which should be imposed to encourage diversification and increasing their performance.

6.2 Export taxes in Indonesia

6.2.1 Effect of log export tax on logging and wood processing industries

Indonesia has an experience imposing tax policy on log export. It occurred in early logging industry grown in the 1970s. In the 1980s, however, the Indonesian government changed her policy, which was from log production directly to a policy oriented towards exports of commodity wood products for export, especially sawnwood and plywood. It was implemented by imposing log export ban policy. Following the financial crisis in the middle of July 1997, the policy backed as it had been imposed in the 1970s. Since 2002, however, the export policy of log has been phased out and backed to the policy imposed in the 1980s.

Theoretically, the effect of tax policy on log export will have affect not only on logging industry but also on primary and further wood processing industries. The study by Astana and Mutaqin (2002) taking the case of the year 2000, reported that the maximum level of export tax which can be imposed on log export is 51% (if 1 USD = Rp 10,000), 45% (if 1 USD = Rp 9,000), and 39% (if 1 USD = Rp 8,000). The imposition of log export tax more than 51%, 45% or 39% will cause a negative profitability of logging industry (Table 6.1). On the

contrary, however, the imposition of log export tax less than 51%, 45% or 39% will cause the exports of all the logs to abroad. This, in turn, will have a further significant effect on primary and further wood processing industries since these two industries are still less efficient compared to competing industries abroad.

At present, however, the government has imposed log export ban. Therefore, the primary and further processing industries enjoy cheaper prices of wood raw material, while the government loses some revenues from that policy. Many argue that such a policy has tended to maintain the inefficiency of primary and further wood processing industries.

The study reveals that under free market mechanism of logs (no export ban or no export tax), while sawnwood market also follows free market mechanism, the profitability of sawnwood industry is still positive. The imposition of export tax as much as 10% on logs will increase the profitability of sawnwood industry up to 14%, compared with the absence of log export tax (Table 6.2). The higher the export tax on logs, therefore, the higher the profitability of the sawnwood industry which will be realized. This, however, is not true for plywood industry. Under free market mechanism of logs, and if plywood market follows free market mechanism, the profitability of plywood industry will be negative. This implies that the plywood industry needs domestic price protection of logs.

Table 6.1 Effect of log export tax on profitability of logging industry

No.	Description	Value (Rp/m^3)	Remark
1	Log export price, FOB (ITTO, 2000)	1,200,000	US$ 1=Rp 10 000
		1,080,000	US$ 1=Rp 9 000
		960,000	US$ 1=Rp 8 000
2	Production cost of log	589,736	
3	Margin for profit of logging industry	610,264	US$ 1=Rp 10 000
		490,264	US$ 1=Rp 9 000
		370,264	US$ 1=Rp 8 000
4	Effect of log export tax (%) on profitability of logging industry		
	Exchange rate: US$ 1=Rp 10 000 Level of log export tax		Percentage change in margin for profit
	0%	610,264	0%
	10%	490,264	-20%
	20%	370,264	-39%
	30%	250,264	-59%
	51%	0	-100%
	Exchange rate: US$ 1=Rp 9 000 Level of log export tax		Percentage change in margin for profit
	0%	490,264	0%
	10%	382,264	-37%
	20%	274,264	-55%
	30%	166,264	-73%
	45%	0	-100%
	Exchange rate: US$ 1=Rp 8 000 Level of log export tax		Percentage change in margin for profit
	0%	370,264	0%
	10%	274,264	-55%
	20%	178,264	-71%
	30%	82,264	-87%
	39%	0	-100%

Source: Astana and Mutaqin (2002)

The price protection by imposing export tax on log as much as 10% will increase the profitability of plywood industry up to 28%. Unfortunately, even higher than 10%, however, the plywood industry will tend to have a negative profitability. It is likely that the plywood industry is unable to operate under free market mechanism of logs since the exchange rate of USD to Rupiah remains about Rp 8,000 per USD (Table 6.3).

Table 6.2 Effect of log export tax on the profitability of sawmilling industry

No.	Description	Value (Rp/m^3)	Remark
1	Log export price, FOB (ITTO, 2000)		
		1,200,000	US$ 1=Rp 10 000
		1,080,000	US$ 1=Rp 9 000
		960,000	US$ 1=Rp 8 000
2	Sawnwood export price, FOB (ITTO, 2000)		
		3,900,000	US$ 1=Rp 10 000
		3,510,000	US$ 1=Rp 9 000
		3,120,000	US$ 1=Rp 8 000
3	Production cost of sawnwood		
		2,325,829	US$ 1=Rp 10 000
		2,107,647	US$ 1=Rp 9 000
		1,889,465	US$ 1=Rp 8 000
4	Margin for profit of sawnwood industry		
		1,574,171	US$ 1=Rp 10 000
		1,402,353	US$ 1=Rp 9 000
		1,230,535	US$ 1=Rp 8 000
5	Effect of log export tax (%) on profitability of sawnwood industry		
	Exchange rate: US$ 1=Rp 10 000 Level of log export tax		Percentage change in margin for profit
	0%	1,574,171	0%
	10%	1,792,353	14%
	20%	2,010,535	28%
	30%	2,228,717	42%
	51%	2,683,742	70%
	Exchange rate: US$ 1=Rp 9 000 Level of log export tax		Percentage change in margin for profit
	0%	1,402,353	0%
	10%	1,598,717	14%
	20%	1,795,080	28%
	30%	1,991,444	42%
	45%	2,293,742	64%
	Exchange rate: US$ 1=Rp 8 000 Level of log export tax		Percentage change in margin for profit
	0%	1,230,535	0%
	10%	1,405,080	14%
	20%	1,579,626	28%
	30%	1,754,171	42%
	39%	1,903,742	55%

Source: Astana and Mutaqin (2002)

Table 6.3 Effect of log export tax on the profitability of plywood industry

No.	Description	Value (Rp/m^3)	Remark
1	Log export price, FOB (ITTO, 2000)		
		1,200,000	US$ 1=Rp 10 000
		1,080,000	US$ 1=Rp 9 000
		960,000	US$ 1=Rp 8 000
2	Plywood export price, FOB (ITTO, 2000)		
		2,900,000	US$ 1=Rp 10 000
		2,610,000	US$ 1=Rp 9 000
		2,320,000	US$ 1=Rp 8 000
3	Production cost of plywood		
		3,674,069	US$ 1=Rp 10 000
		3,455,887	US$ 1=Rp 9 000
		3,237,705	US$ 1=Rp 8 000
4	Margin for profit of plywood industry		
		-774,069	US$ 1=Rp 10 000
		-845,887	US$ 1=Rp 9 000
		-917,705	US$ 1=Rp 8 000
5	Effect of log export tax (%) on profitability of plywood industry		
	Exchange rate: US$ 1=Rp 10 000 Level of log export tax		Percentage change in margin for profit
	0%	-774,069	0%
	10%	-555,887	28%
	20%	-337,705	56%
	30%	-119,524	85%
	51%	335,502	143%
	Exchange rate: US$ 1=Rp 9 000 Level of log export tax		Percentage change in margin for profit
	0%	-845,887	0%
	10%	-649,524	23%
	20%	-453,160	46%
	30%	-256,796	70%
	45%	45,502	105%
	Exchange rate: US$ 1=Rp 8 000 Level of log export tax		Percentage change in margin for profit
	0%	-917,705	0%
	10%	-743,160	19%
	20%	-568,615	38%
	30%	-394,069	57%
	39%	-244,498	73%

Source: Astana and Mutaqin (2002)

6.2.2 Effect of combined export taxes on wood processing industries

Effect of combined export taxes on profitability of wood processing industry will neutralize one to another. The imposition of export tax of log will benefit for wood processing industry. On the contrary, however, the export tax of wood products will reduce the profitability of wood processing industry. The study reveals that under exchange rate of USD 1.0 is equal to Rp 10,000, the imposition of log export tax of 51% will cause sawnwood industry still profitable given the export tax imposed on sawnwood is less than 69% of its export price. Whereas under exchange rate of USD 1.0 is equal to Rp 9,000, the imposition of log export tax of 45% will cause sawnwood industry still profitable given the export tax imposed on sawnwood is less than 65% of its export price. Moreover, under exchange rate of USD 1.0 is equal to Rp 8,000, the imposition of log export tax of 39% will cause sawnwood industry still profitable given the export tax imposed on sawnwood is less than 61% of its export price (Table 6.4). In other words, the higher one of the combined export taxes is imposed, the less of the profitability of the sawnwood industry received.

In the case of plywood, however, the plywood industry tends to have a negative profitability under the exchange rate of USD 1.0 is equal to Rp 8,000 (Table 6.5). Under this level of exchange rate, the plywood industry has a negative profitability even the export tax on logs is increased up to 39%, which is the maximum level where logging industry is still profitable, and the absence tax on plywood export. In contrast, it is likely that the plywood industry will have a positive profitability under exchange rate of USD 1.0 is equal to more than Rp 9,000. Under the exchange rate of USD 1.0 is equal to Rp 9,000, the plywood industry will have a positive profitability given that the maximum export tax on logs is less than 45% and the maximum export tax on plywood is less than 2%. Whereas under the exchange rate of USD 1.0 is equal to Rp 10,000, the plywood industry will have a positive profitability given that the maximum export tax on logs is less than 51% and the maximum export tax on plywood is less than 12%.

Table 6.4 Effect of log and sawnwood export taxes on the profitability of sawmilling industry

No.	Description		Value (Rp/m^3)	Remark
1	Export price of sawnwood, FOB (ITTO, 2000)			
			3,900,000	US$ 1=Rp 10 000
			3,510,000	US$ 1=Rp 9 000
			960,000	US$ 1=Rp 8 000
2	Production cost of sawnwood			
			2,325,829	US$ 1=Rp 10 000
			2,107,647	US$ 1=Rp 9 000
			1,889,465	US$ 1=Rp 8 000
3	Margin for profit of sawnwood industry			
			1,574,171	US$ 1=Rp 10 000
			1,402,353	US$ 1=Rp 9 000
			1,230,535	US$ 1=Rp 8 000
4	Effect of log and sawnwood export taxes (%) on profitability of sawnwood industry			
	Exchange rate: US$ 1=Rp 10 000 Level of export taxes			Percentage change in margin for profit
	10%	10%	1,402,353	-11%
	20%	20%	1,230,535	-22%
	30%	30%	1,058,717	-33%
	51%	**69%**	0	-100%
	Exchange rate: US$ 1=Rp 9 000 Level of export taxes			Percentage change in margin for profit
	10%	10%	1,247,717	-11%
	20%	20%	1,093,080	-22%
	30%	30%	938,444	-33%
	45%	**65%**	0	-100%
	Exchange rate: US$ 1=Rp 8 000 Level of export taxes			Percentage change in margin for profit
	10%	10%	1,093,080	-11%
	20%	20%	955,626	-22%
	30%	30%	818,171	-34%
	39%	**61%**	0	-100%

Source: Astana and Mutaqin (2002)

Table 6.5 Effect of log and plywood export taxes on the profitability of plywood industry

No.	Description		Value (Rp/m^3)	Remarks
1	Export price of plywood, FOB (ITTO, 2000)			
			2,900,000	US$ 1=Rp 10 000
			2,610,000	US$ 1=Rp 9 000
			2,320,000	US$ 1=Rp 8 000
2	Production cost of plywood			
			3,674,069	US$ 1=Rp 10 000
			3,455,887	US$ 1=Rp 9 000
			3,237,705	US$ 1=Rp 8 000
3	Margin for profit of plywood industry			
			-774,069	US$ 1=Rp 10 000
			-845,887	US$ 1=Rp 9 000
			-917,705	US$ 1=Rp 8 000
4	Effect of log and plywood export taxes (%) on profitability of plywood industry			
	Exchange rate: US$ 1=Rp 10 000 Level of export taxes			Percentage change in margin for profit
	10%	10%	-845,887	-9%
	20%	20%	-917,705	-19%
	30%	30%	-989,524	-28%
	51%	**12%**	0	100%
	Exchange rate: US$ 1=Rp 9 000 Level of export taxes			Percentage change in margin for profit
	10%	10%	-910,524	-8%
	20%	20%	-975,160	-15%
	30%	30%	-1,039,796	-23%
	45%	**2%**	0	100%
	Exchange rate: US$ 1=Rp 8 000 Level of export taxes			Percentage change in margin for profit
	10%	10%	-975,160	-6%
	20%	20%	-1,032,615	-13%
	30%	30%	-1,090,069	-19%
	39%	**-11%**	0	100%

Source: Astana and Mutaqin (2002)

Mouldings industry, however, tends to have a positive profitability under three regimes of exchange rate (Table 6.6). Under the level of exchange rate of USD 1.0 is equal to Rp 8,000, the moulding industry has a positive profitability given that the export tax on logs is less than 39%, which is the maximum level where logging industry is still profitable, and the tax on

sawnwood export is less than 61%, and the export tax on moulding is less than 50%. The profitability of moulding industry will increase under the exchange of USD 1.0 is equal to more than Rp 8,000. Under the exchange rate of USD 1.0 = Rp 9,000, the moulding industry will have a positive profitability given that the maximum export tax on logs is less than 45%, and the maximum export tax on sawnwood is less than 65%, and the maximum export tax on moulding is less than 55%. Whereas under the exchange rate of USD 1.0 is equal to Rp 10,000 the moulding industry will have a positive profitability given that the maximum export tax on logs is less than 51%, and the maximum export tax on sawnwood is less than 69%, and the maximum export tax on moulding is less than 60%.

6.3 Other national policies

Other national policies, which significantly affect trade of wood products, generally relate to production cost of logs (cost of management of natural production forest/cost of logging industry). The study conducted by IPB FAHUTAN (2003) reported that there are several types of levies imposed by government on management of natural production forest. They can be basically grouped into 3 categories, which are: a) taxes (excluding export tax) and non-taxes levied by central government, b) taxes and non-taxes levied by local government, and c) other levies. Of the total levies, the highest level of the levy was imposed by the central government, then followed by local government and other levies (Table 6.7). As seen in table 7, the level of tax (excluding export tax) and non-tax levied by central government was generally more than 80% of the total levies imposed, while by local government and other levies, each was less than 10%.

The reduction in total levies imposed will certainly benefit to increase the profitability of logging industry. On the other hand, however, it may concurrently accelerate forest degradation since from the cost structure of log production, cost component of forest maintenance was very low (Table 6.8). The total cost of logging industry (total cost of log production), the highest cost component was in forest harvesting. It ranged from the lowest level of about 30%, which generally occurs in swamp forests, up to the highest level of about 70%, which generally occurs in dryland forests. Whereas cost components of forest maintenance plus environmental and social obligations totally ranged from less than 5% in swamp forests, up to the highest level of about 6.5% in dryland forests. Nevertheless, the reduction of total levies may become an effective policy to reduce forest degradation given

that it will genuinely be redistributed by logging industry to forest maintenance as well as environmental and social obligations.

Table 6.6 Effect of Log, Sawnwood and Moulding Export Taxes on the Profitability of Moulding Industry

No.	Description			Value (Rp/m^3)	Remarks
1	Export price of moulding, FOB (ITTO, 2000)				
				5,511,365	US$ 1=Rp 10 000
				4,960,228	US$ 1=Rp 9 000
				4,409,092	US$ 1=Rp 8 000
2	Production cost of moulding				
				4,894,656	US$ 1=Rp 10 000
				4,504,656	US$ 1=Rp 9 000
				4,114,656	US$ 1=Rp 8 000
3	Margin for profit of moulding industry				
				616,709	US$ 1=Rp 10 000
				455,572	US$ 1=Rp 9 000
				294,436	US$ 1=Rp 8 000
4	Effect of log, sawnwood and moulding export taxes (%) on profitability of moulding industry				
	Exchange rate: US$ 1=Rp 10 000 Level of export taxes				Percentage change in margin for profit
	10%	46%	10%	1,857,925	201%
	20%	52%	20%	1,524,970	147%
	30%	57%	30%	1,192,016	93%
	51%	**69%**	**60%**	0	-100%
	Exchange rate: US$ 1=Rp 9 000 Level of export taxes				Percentage change in margin for profit
	10%	46%	10%	1,503,152	230%
	20%	51%	20%	1,148,379	152%
	30%	57%	30%	793,607	74%
	45%	**65%**	**55%**	0	-100%
	Exchange rate: US$ 1=Rp 8 000 Level of export taxes				Percentage change in margin for profit
	10%	45%	10%	1,148,379	290%
	20%	51%	20%	771,788	162%
	30%	56%	30%	395,197	34%
	39%	**61%**	50%	0	-100%

Source: Astana and Mutaqin (2002)

Table 6.7 Type and level of Levy Imposed on Management of Natural Production Forest

No.	Type of Levy	Swamp Forest (%)	Dryland Forest (%)		
			Eastern Part of Indonesia	Central Part of Indonesia	Average
1	Non-tax levied by central govt.	61.3	91.0	81.9	83.9
	a. Reforestation fund	41.7	64.4	56.6	58.1
	b. Forest resource provision	19.6	26.6	25.3	25.8
2	Tax levied by central govt.	28.7	-	3.8	5.1
3	Tax & non-tax by local govt.	5.2	2.8	9.2	5.8
4	Other levies	4.8	6.2	5.1	5.2
5	Total	100	100	100	100
	Total (Rp/m^3)	**166,789**	**84,849**	**206,225**	**191,026**

Source: Fahutan IPB (2003)

Table 6.8 Cost Structure of Log Production (Management of Natural Production Forest)

No.	Cost Components	Swamp Forest	Dryland Forest of Eastern Part	Dryland Forest of Central Part	Average
		%			
1	Forest planning	5.0	14.4	9.3	8.9
2	Forest harvesting	28.0	72.5	39.5	41.9
3	Forest maintenance	2.1	5.0	3.1	3.3
4	Tax levies	0.7	-	0.0	0.0
5	Environmental and social obligations	1.2	1.2	3.4	3.1
6	R&D	-	0.6	0.3	0.3
7	Repairing & maintaining equipments & vehicles	10.6	-	16.0	15.3
8	Depreciations	12.1	6.2	5.8	5.5
9	General & adm. costs (camp & branch office)	40.2	-	22.6	21.6
	Total before non-tax levies (%)	**100.0**	**100.0**	**100.0**	**100.0**
	Total before non-tax levies (Rp/m^3)	**267,665**	**307,777**	**476,072**	**497,688**

Source: Fahutan IPB (2003)

7 EFFECT OF TRADE RESTRICTIONS ON COMPETITIVENESS OF INDONESIAN WOOD PRODUCTS EXPORTS

7.1 Types of restrictions on international trade in wood products

Uruguay Round negotiations under the auspices of the GATT/the WTO were officially concluded in Marrakesh in April 1994. Issues related to international trade in wood products have since then received a keen attention. There are differing views on how trade liberalization affects the forest degradation through trade in wood products. The extreme argument would assert that international trade has nothing to do with forest degradation given that wood products traded internationally come from sustainable harvest of sustainable forests. Other arguments opposing this would insist that trade liberalization contributes to forest. It is widely perceived that trade liberalization drive lower prices of wood products, leading to higher wood products consumption and increased harvest, some of which finally affect forest degradation.

On its own weight, trade liberalization has undoubtedly lent support to a rapid expansion of world trade and accompanying concerns about its environmental impacts. The simple mechanisms of trade's impact on the environment are the following:

- Liberalized trade can add value to forest products that are sustainably produced, by creating market opportunities for sustainable products.
- Conversely, the increased competition can create pressure to exploit the resource base more intensively, and possibly unsustainably.

FAO has promoted a debate on trade's interaction with SFM during 2003. Without coming anywhere near to a consensus on the issue, FAO predicted trade restrictions on international trade in wood products to persist. Trade measures, which may act as barriers to trade in wood products include (FAO, 2003):

a) Specific limitations on trade: quantitative restrictions; export restraints; health and sanitary regulations; licensing; embargoes; minimum price regulations, etc.

b) Charges on imports: tariffs; variable levies; prior deposits; special duties on imports; internal taxes, etc.

c) Standards: industrial standards; packaging; labeling and marking regulations, etc.

d) Government interventions in trade: government procurement; stock trading; export subsidies; countervailing duties; trade diverting aid, etc.
e) Customs and administrative entry procedures: customs valuation; customs classification; antidumping duties; consular and customs formalities and requirements, and sample requirements.

They may be categorized into three measures: tariff, non-tariff measures, and trade impediments. Tariff and non-tariff measures are formal ones, and subjects of formal international trade negotiations such as WTO. Trade impediments are informal, but their effects can be similar to tariff and non-tariff measures. Trade impediments are not considered to be formal restrictions because they are either legal under GATT/WTO rules or outside its control (Bourke, 1998). In general, the level of tariffs and non-tariffs post-Uruguay round have been low. However, the implications of their further reduction or elimination for individual country will vary depending on whether the country is primarily an exporter or an importer, on the products traded, and the country traded with. The impact will moreover depend on what activities are being undertaken along the value chain of forest products (Bourke, 1999).

7.2 Tariffs

A tariff is a levy imposed by government of importing countries to a product imported from other countries. The actual customs valuation of a particular delivery of goods can be made in different ways, e.g. on the Brussels Definition of Value (BDV). The basic principle of the BDV is that dutiable value is the **normal price or import price of goods at the port or place of importation**. It pre-supposes that the sale has taken place in the open market between an independent buyer and seller. Where goods are dutiable, *ad valorem* or specific rates may be applied. An *ad valorem* rate, which is the most commonly applied, is a percentage of the assessed value of the imported goods. A specific rate is a particular amount per unit of weight or other quantity. (Market Access…, 2003)

The level of customs value has a clear and direct impact on the value-dependant instruments like fees and taxes. Furthermore, if valuations are not harmonized, they have an indirect effect on relative competitiveness between countries. Valuation is regulated by the Agreement on Implementation of Article VII of GATT 1994.

Under the GSP (Generalized System of Preferences) regime, industrialized importing countries offer lower tariffs to selected developing countries without requiring any reciprocal benefits. Each importing country can offer GSP preferences against its own pre-conditions as per country where they import from. Importer countries can therefore be quite selective both as to the product and the exporting country on which they apply the GSP. A country may either exclude a particular product, make special reductions, or may give duty-free access through a quota system. The developing country, which has previously enjoyed GSP treatment, may graduate out from the system on certain level of economic development: This has been the case with the newly industrialized countries (NICs) of South-East Asia. (Market Access…, 2003)

In 1997, the Asia-Pacific Economic Cooperation (APEC) countries called for the nomination of sectors for early voluntary sectoral liberalization (EVSL). Canada, USA, New Zealand and **Indonesia** proposed the forest products sector. This led to the Accelerated Tariff Liberalization (ATL) proposal to cover all primary forest products: logs, wood products, pulp, paper and paper products. The elimination of tariffs on pulp, paper and paper products was speeded up by parties of GATT zero-for-zero agreement from January 1, 2004 to January 1, 2000. Other countries were allowed to delay removal until January 1, 2002. (Buongiorno, *et al*., 2003).

Even in some industrialized countries, tariffs on certain forest products (such as wood based panels) remain on effective levels (Table 7.1). In some countries tariffs in the range of 10% are still common. The EU, Japan and USA apply nearly zero tariffs on further processed wood products from GSP countries; for most other countries common rates are in the range of 2-6%. Besides, there are initiatives to fully abolish tariffs on wooden furniture by 2005.

Looking at the tropical producer side, the less developed countries usually retain higher tariffs than developed countries (Table 7.2). In order to protect their domestic producers, most Asian ITTO producer countries impose tariffs (on average at levels between 10%-35%) on imports of value-added products. At the same time, however, countries that are major buyers of the value-added products exported by the producer countries provide considerable tariff relief,

especially those under the GSP. Regional free trade agreements like AFTA will gradually push for tariff reductions also on the producer side.

Thus, the commitments to trade liberalization displayed by the different countries have so far produced very mixed results. This is indicative of the balancing acts performed by governments wishing to provide protection to their domestic industries and, at the same time, support the liberalization of trade in general. The strongest advocates of free trade are usually those with the greatest potential to benefit from it. While the producer countries may appear to be protecting their domestic industrial base with higher import tariffs, consumer countries are responding by importing proportionately less of their value-added products. High tariffs seem furthermore be a major obstacle to trade growth between developing countries. In this respect, both importers and exporters would do well not to allow tariff levels to escalate at the same time as their trade in value-added products increases. (ITC & ITTO, 2002)

Table 7.1 Tariff rates for forest products in selected developed countries

		Australia		EU		Japan		USA		Canada		New Zealand	
HS code	**Product description**	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP	MFN	GSP
44	**SOLID WOOD**												
44.01	Chips and particles	5	0	0		0		0		0		0	
44.03	Wood in rough (*i.e.* logs) whether or not roughly …	0, 5		0		0		0		0		0	
44.07	Wood sawn lengthwise sliced or peeled or planed	0- 5	0- 4	0 (C) 0- 2.5 (T)	0	4.8- 7 (C) 7.6 (NC)	0 0	0		0		0, 7	5.5
44.08	Veneer	0, 5	0	3, 4(C)	0	5	0, 2.5	0		0		0, 6.5 ,7	5, 5.5
44.09	Wood-tongued, grooved, beadings, mouldings etc.	5	4	0.0		4.1- 6.3	0	0, 4.9	0	0, 3.5	0	0,5	4
44.10	Particleboard and similar	5		7	4.9	6.3	0	0	0	0, 2.5	0	5	4
44.11	Fiberboard	5	4, 5	7	4.9	2.8- 3.6	0	0	0	0, 6	0	5	4
44.12	Plywood and laminated Wood	5	4, 5	6- 10	4.2- 7	7.5 (C) 7.4-12 (T)	0, 6 (C) 0- 10 (T)	0- 8 (C) 0- 8 (NC)	0 0	9.5 (C) 0, 5 (NC)	3 (C) 0,3 (NC)	7	5.5
44.15	Packing cases, drums, pallets etc.	5	4	3	0	3.4- 4.7	0	0, 10.7	0	0, 9.5	0, 3, 5	0, 7	5.5
44.18	Builders' joinery and carpentry	5	4	0- 3	0- 2.1	2.8- 6.3	0	0- 4.8	0	0- 8	0	6.5	5
47	**PULP AND WASTEPAPER**												
47.01	Wood pulp (mechanical)			0		0		0		0		0	
47.02-05	Wood pulp (chemical)			0		0		0		0		0	
47.07	Waste paper			0		0		0		0		0	
48	**PAPER**												
48.01	Newsprint	5		2.5	0	0		0		0		0- 6.5	5
48.04	Uncoated kraft paper in rolls or sheets	5	0- 5	3.5	0	1.8- 2.5	0	0	0	0	0	0- 7	5.5
48.08	Corrugated paper and board in rolls or sheets	0,5		6-10	0	2.4- 2.9	0	0-.5	0	0		7	5.5
48.10	Coated paper (printing) in rolls or sheets	0,5		7.2	0	2.9	0	0	0	0		0- 6.7	5
94	**FURNITURE**												
94.01	Seats with wooden frames	5		0		0		0		0, 9.5	0- 6	7	5.5
94.03	Furniture of wood	5		0- 2.7	0	0		0		0, 9.5	0	7	5.5

MFN Most Favoured Nation (C) Coniferous (T) Tropical
GSP Generalized System of Preferences (NC) Non-coniferous

Table 7.2 Tariff rates for forest products in selected developing countries

HS code	Product description	China	India	Indones	Korea	Malays	Thail.	Chile	S. Afr	Brazil	Mexico	Taiwan
44	**SOLID WOOD**											
44.01	Chips and particles	0	5	0	2	20	1	7	0	4.5	10	0
44.03	Wood in rough (i.e. logs) whether or not roughly	0	5	0	2	0	1	7	0	4.5	10	0
44.07	Wood sawn lengthwise sliced or peeled or planed	0	25	0- 10	5	0	1,5	7	0	8.5	10, 15	0
44.08	Veneer	5- 8	35	5	5	0, 20	10	7	0	8.5	10	0
44.09	Wood-tongued, grooved, beadings, mouldings etc	15	35	0	8	20	20	7	0	12.5	10, 20	0
44.10	Particleboard and similar	16, 18	35	5	8	20	20	7	15	12.5	15, 20	0, 3
44.11	Fiberboard	11- 18	35	5, 10	8	20	20	7	10	12.5	15	3, 5
44.12	Plywood and laminated Wood	15	35	15	8	25- 40	20	7	10	12.5	18 (C) 23 (NC)	4- 15 (C) 10,15 (NC)
44.15	Packing cases, drums, pallets etc	10	35	10	8	20	20	7	10	12.5	23	2
44.18	Builders' joinery and carpentry	16	35	15	8	20	20	7	15	16.5	23	2
47	**PULP AND WASTE PAPER**											
47.01	Wood pulp (mechanical)	0	5	0	0	0	5	7	0	6.5	5	0
47.02-05	Wood pulp (chemical)	0	5	0	0, 2	0	5	7	0	6.5	3, 5	0, 1
47.07	Waste paper	0	5	0, 20	2	0	1	7	0	6.5	3	0
48	**PAPER**											
48.01	Newsprint	3- 45	15	5	7.5	5	10	7	10	12	18	0
48.04	Uncoated kraft in rolls or sheets	10, 15	35	0- 10	3- 7.5	0, 15	10	7	9	16.5	13	4.5
48.08	Corr. paper and board etc. in rolls or sheets	12	35	10	7.5	15, 25	10	7	9	14.5	13	2.2- 5
48.10	Coated paper (printing) in rolls or sheets	15	35	0- 10	7.5	0- 15	10	7 7	9	16.5	13	5, 6.3
94	**FURNITURE**											
94.01	Seats with wooden frames				8	30	20	7	20	20.5	18	
94.03	Furniture of wood	22	35	10- 20	8	30	20	7	20	20.5	23, 25	1.25- 10

(T) Tropical (C) Coniferous (NC) Non-coniferous

7.3 Tariff escalation

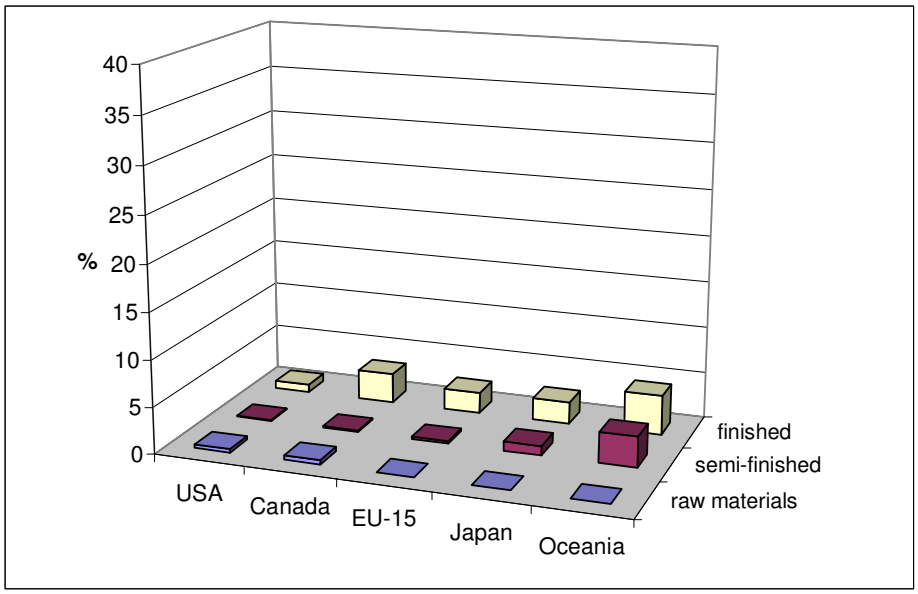
Trade liberalisation has reduced tariff escalation, which reflects schemes where the tariffs become higher and higher as value added in traded products increases. According to assessment by UNCTAD: "*The practice of tariff escalation biases exports towards unprocessed resource-based commodities, characterized by low value added. This may cause difficulties to commodity-dependant developing countries in their efforts to diversify their export base…the extent of tariff escalation remains significant*" (UNCTAD, 2003).

The post-Uruguay Round tariff levels of wood products by main industrialized regions are shown in Figure 7.1. It seems clear that the differentiation according to processing stage is an important trade policy issue, and it is reflected in the applied relative tariff rates. In general the tariffs escalate from raw materials to finished products, and semi-finished products are often (but not always) in the mid-range. (Market Access…, 2003)

According to Figure 7.2 the overall levels of tariffs are clearly higher in the developing countries. The existence of escalation is very strongly demonstrated. It is worth noting that in the two Asian sub-regions, the semi-finished tariff rates are lower than for raw materials or for finished goods. This can be imagined to be intentional, allowing the Asian countries to import the much-needed primary processed products, which can also be labeled as semi-finished. As a part of their perceived role in the division of labor of the world's manufacturing, their own industries consequently re-manufacture those inputs for exports at a growing pace.

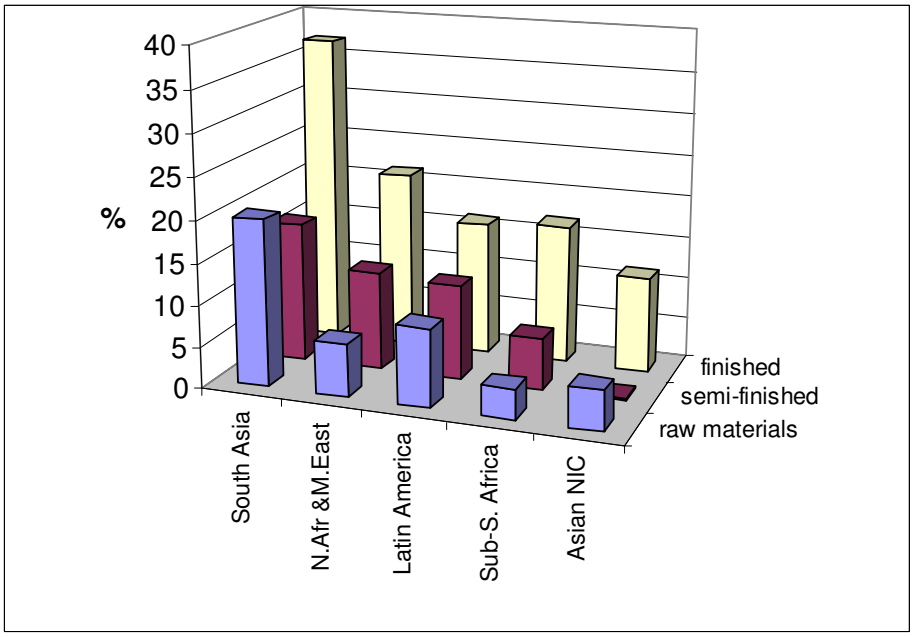
In conclusion, a limited scope for tariff liberalization remains in the industrialized countries. On the contrary, the tariff situation in the developing world is still very strongly restrictive and forms high barriers against international trade, both between them and the developed world, and among developing countries themselves. Some large importers did not participate in the Uruguay Round (e.g. China). However, a number of those countries have by now undergone accession to the WTO (most notably China), and their tariffs are bound to come lower as a result.

Figure 7.1 Tariff escalation for wood products in the developed countries



Source: UNCTAD TRAINS, 2003;UNCTAD, 2003 (applied tariff rates) (in Market Access…, 2003)

Figure 7.2 Tariff escalation for wood products in the developing countries



Source: UNCTAD TRAINS, 2003;UNCTAD, 2003 (applied tariff rates) (in Market Access…, 2003)

7.4 Rules of origin

Determining where a product comes from is no longer easy when raw materials and parts travel around the globe as inputs for out-sourcing manufacturing plants. The chains of custody are particularly complex in timber products, which are traded in different forms like raw materials, primary and further processed products. Many tropical products are combinations of different timber species from different origins, and there are emerging also products where tropical timber is combined with other materials (plastics, steel, aluminum, other fibers).

Rules of origin are the criteria used to define where a product was made. As a basic definition, rule of origin is defined as the country where the **"product was last substantially processed, with economic justification".** The interpretation of the definition is clearly not explicit. Rules of origin play an essential role in trade rules, because many policies do discriminate between exporting countries. The imposing of quotas, preferential tariffs, taking action anti-dumping grounds, setting countervailing duty (a counter-measure on export subsidies), and other policy measures are available in the toolbox. Rules of origin are important for compiling trade statistics, and justify country labels that are attached to products. This raises the question on how to deal with the third countries (neighbouring countries, China, etc.) who may be willingly taking advantage of the rules of origin when re-manufacturing wooden articles of imported timber. (Market Access…, 2003)

7.5 Indonesia and regional trade liberalization

7.5.1 Association of South East Asian Nations

The eight member countries in the Association of South East Asian Nations (ASEAN) are Malaysia, Indonesia, Philippines, Singapore, Thailand, Brunei, Vietnam and Myanmar.

Until the Asian economic crisis, the countries of ASEAN were among the fastest growing economies in the world. Indonesia, Malaysia, Singapore and Thailand all had GDP growth rates of more than 6%/yr. for a lengthy portion of the 1980s and 1990s. As one means of boosting the intra-ASEAN trade, a Common Effective Preferential Tariff (CEPT) scheme was initiated in 1992. The objective was to arrive at an ASEAN Free Trade Area (AFTA) by 2008.

In the years leading to AFTA, tariffs on manufactured and processed agricultural goods would be reduced first to a maximum of 20% and subsequently to a maximum of 5%. In 1995, it was decided to accelerate the implementation of tariff cuts to realize AFTA by 2003.

Obviously, the implementation of AFTA will significantly improve market access and should encourage trade inside the region in forest products. It will furthermore intensify competition in semi-processed and secondary processed wood products (SPWP) to the extent that inefficient and high cost producers are likely to face problems. (Market Access…, 2003). Indonesia was supposed to play a leading role in defining a common interregional trade policy for the forestry sector under the AFTA framework, but little progress has been made on the issue.

7.5.2 Asia-Pacific Economic Cooperation

Asia-Pacific Economic Cooperation (APEC) was created in 1989 with a membership of Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand and their six Pacific partners Australia, Canada, Korea, Japan, New Zealand and the USA. Later, the membership was enlarged to include China, Hong Kong, Taiwan, Papua New Guinea, Mexico and Chile.

Under the Bogor Declaration signed in 1994, APEC agreed on a timetable for trade liberalization. Negotiations to achieve free trade were agreed to kick-off in 2000 and be wrapped up in ten years by developed countries, in 15 years by NICs, and in 20 years by developing countries. Since APEC is committed to the principle of "open regionalism", trade concessions would then be extended to non-members on a reciprocal basis to promote global trade liberalization.

In 1997, APEC economies agreed to include forest products among those nine sectors that are liberalized under the early voluntary sectoral liberalization (EVSL). In November 1998, APEC moved the sector discussions on tariff reductions to the WTO for finalization and implementation with an agreed product coverage, end rates and time-lines. The initiative was later renamed accelerated tariff liberalization (ATL). ATL expands the so-called "zero for zero" agreement among some APEC members to eliminate tariffs on forest products in their trade. A similar effort to achieve this target on the Uruguay Round failed, and the full objective of the process within APEC has not been achieved either. This proposal has stirred a

lot of controversy particularly among environmental groups that are concerned about the impacts it could have on the environment. (Market Access…, 2003)

7.6 Non-Tariffs Measures

7.6.1 Definition and types of measures

The term 'non-tariff measures' (NTMs) refers to governments laws, regulations, policies and practices which either protect domestically produced goods from the full weight of foreign competition or artificially stimulate exports of certain products (APEC, 1999). Some deliberately hinder imports, some have non-trade related objectives like environmental protection. In the context of WTO, the following NTMs are debated: quantitative restrictions on imports, requirements for sanitary and phyto-sanitary standards, technical-health regulations, quality labelling, recycling, use of subsidies, tax breaks, export restrictions and levies (Forest Notes, 1999).

NTMs appear far more severe for developing country exporters, who aim at the markets of the developed countries, than *vice versa.* This is especially true for developing countries trying to enter the big markets like the EU, Japan, Canada, and USA. NTMs are very frequently occurring, and seem to penalise developing countries. The most difficult obstacles may, however, be posed through the so-called voluntary measures, such as (i) certification and labelling, (ii) central and local government procurement rules, and (iii) meeting the other "sustainability and legality" requirements (as reflected in the nascent EU-FLEGT regulations, for instance).

While the tariff barriers will continue to be lowered further, the role of non-tariff barriers will become increasingly important. In wood product markets, NTMs can take several forms and may be motivated by different considerations:

1. Socially and politically motivated NTMs include:

- Government actions to ban, or set quotas for exports of unprocessed logs, differentiated export taxation according to the degree of processing.
- Surcharges, import taxes, import substitution schemes, procurement restrictions for public construction.

2. Health and safety motivated NTMs can be:

- Restrictions on phyto-sanitary and pest control grounds.
- Prescriptive and culturally-varying building codes and standards (as in Japan).
- Non-acceptance of foreign testing methods.

3. Environmentally motivated NTMs include:

- Subsidies for afforestation or reforestation.
- Direct harvesting restrictions.
- Requirements for the certification and labeling of wood products.
- Mandated minimum recycled fiber contents.
- Import bans issued by governments, local governments or municipalities, restricting the market access of products on environmental concerns.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is instrumental in the environmental part of the market access issue, when concerns mount on the genetic origin of the traded commodity. CITES aims at preventing over-exploitation of endangered species through international trade. The Convention bans trade in species most threatened with extinction (listed in Appendix I) and strictly controls trade (export permits) in species that are in risk of extinction (Appendix II). Appendix III contains species nominated by individual Parties, for which those parties undertake to issue export permits. In 2002, 25 tree species appeared in the three Appendix listings. Indonesian ramin was one of the latest entries. (Market Access…, 2003)

The implications of the Uruguay Round for the non-tariff barriers increasingly faced by forest products is less clear. However, two WTO agreements, the Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures and the Agreement on Technical Barriers to Trade (TBT), do provide the basis for tackling certain non-tariff measures that have been used as trade barriers against forest products (Barbier, 1996).

7.6.2 Sanitary and phyto-sanitary measures (SPS)

Sanitary and phyto-sanitary (SPS) measures are used to guarantee that the producer has been capable of cleaning, sanitizing, sterilizing or by other means to render the offered commodity free from unwanted dirt, seeds, pests or germs.

Standards in relation to plant health are generally acknowledged legitimate quite unanimously worldwide. However, the complexity and severity of the requirements may have an effect on trade and be interpreted as impediment by exporters. The SPS agreement could reduce the use of inspection, quarantine and treatment of imported forest products as prohibitive measures beyond what is necessary to protect domestic human, animal and plant populations from pests or diseases. Exporters perceive costs of conforming to phyto-sanitary rules as being non-value adding compared with other essential requirements such as kiln drying or preservative treatment. (Market Access…, 2003)

7.6.3 Technical Barriers to Trade (TBT)

The objectives of the TBT Agreement are (i) to ensure that technical regulations and standards are not used as disguised protectionist measures, and (ii) to reduce the extent to which technical regulations and standards operate as barriers to market access, primarily by encouraging their international harmonization. Some of the main provisions of the TBT Agreement have been summarized below:

- In respect to standards, products originating from other WTO Member countries shall not be accorded treatment less favorable than like products of national origin.
- Standards and the process of their preparation shall not create an unnecessary obstacle to international trade.
- International standards shall be used if they exist and are relevant.
- National standardizing bodies shall participate in the preparation of international standards.
- The standardizing body in a Member country shall avoid duplication of or overlap with the work of other standardizing bodies in the national territory or of international or regional standardizing bodies.

There are more substantive provisions than aforementioned ones. TBT agreement sets out procedures to ensure that technical regulations and standards, including packaging, marking and labeling requirements, do not create unnecessary obstacles to international trade. The TBT seeks to ensure that product standards are not used as disguised protectionist measures, and to reduce the extent to which they act as barriers to market access. The TBT agreement could limit the use of technical regulations on forest products as non-tariff restrictions. It aims to ensure that technical regulations would rather serve their purpose in protecting consumer

health and safety, preventing environmental degradation and meeting the basic product quality and design standards.

While codes and standards are widely deemed as necessary for defining the level playing field in international trade, they may include such importer country building codes and approval systems, that their related testing procedures may pose serious obstacles in the exporter's local conditions. Code harmonization, and creation of performance-based standards will in principle facilitate trade, but in reality, their development has typically progressed only slowly.

In plywood, for instance, the common standards used by Indonesia are: B/BB, B/CC, BB/CC (to the EU), BB, CC, overlay utility value-added grades (to the USA), BB/CC, OVL/Btr (to Japan), and BB/CC thick panels (to the Middle East). The Indo exporters are by rule following the plywood standards set in the target markets. These include the British Plywood Standard for the EU, IWPA standard for the US, JAS (JPIC) standard in Japan, while somewhat less standardized trade goes to the Middle East markets. APKINDO noted, however, that there had recently been new regulatory changes in the formaldehyde emission limits of JAS, and new health and safety related changes in the form of the EU's CE-marking for plywood. Both generate costs for plywood industry to comply, e.g. in the form of inspections. In the past Mutu Agung Lestari handled the quality standardization and certification processes for the industry, now Registered Foreign Certification Office (RFCO) is in charge. CE marking is still under inspection, so no mills have been certified under that as yet. The Directive on CE-marking for plywood entered into force 1st April 2004. (APKINDO interview, Oct. 2003)

The CE Marking[1] that was imposed in 2003 on panel sector, is bound to evolve into other building products in the BJC segment in the next few years. It is expected to become operational in 2005 and obligatory in 2006 on the following BJC products sold in the EU markets: glulam timber, finger-jointed structural timber, prefabricated trusses, structural laminated veneer lumber (LVL) prefabricated wall, floor and roof elements for timber frame houses, wood flooring, and solid wood panelling/cladding. CE Marking is a key tool for

[1] CE Marking is a mandatory mark for approximately 70% of the products sold on the EU market. The letters "CE" are the abbreviation of French phrase "**C**onformité **E**uropéene" which translates into "European Conformity".

harmonisation of quality and safety of wood products and fulfilling the Construction Product Directive (CPD) (Carrefour International du Bois, 2004).

7.6.4 Other measures

A possible indirect impact of the Uruguay Round may be the lowering of other long-standing non-tariff barriers in individual markets. There is a set of agreed limitations and clarifications on the use of anti-dumping and countervailing duties, customs valuation and licensing procedures, and market access restrictions. This makes the exercising of *ad hoc* measures more difficult. For example, GSP schemes are provisional and therefore fall under a renewal process regularly. The European Union has recently revised its GSP plywood tariff/quota scheme. The US GSP scheme (including wood products) was most recently renewed in 2002.

The Doha Development Agenda of World Trade Organization (WTO) trade talks was expected to significantly influence the trading environment for forest products. Among the questions under negotiation are the level of tariffs, and discussions on trade and environment. In addition, trade policy issues are often agreed at the regional and bilateral levels, which may from their part influence trade conditions. Regional processes include most notably AFTA (ASEAN Free Trade Area) and FTAA (Free Trade Area of the Americas). Bilateral MoUs have been signed by Indonesia to curb illegal logging with China, the UK and Malaysia, with mixed results.

In November 2002, the United States proposed at the WTO for the elimination of tariffs on all consumer and industrial products by no later than 2015 (USDA Foreign Agricultural Service, March 2003). Under the proposal, tariffs on products in the Uruguay Round zero-for-zero sectors (e.g. paper) and in certain other sectors (e.g. wood products) would be eliminated as soon as possible, but no later than 2010. In the negotiations for FTAA, the United States has proposed that the tariffs on paper and wood products be eliminated immediately, upon entry into force of the FTAA.

In July 2003 the United States issued a list of non-tariff barriers affecting market access for non-agricultural products. In the wood products sector, the statement reads, *"United States industry reports that building codes and product standards are often drafted in such a manner that restricts the expansion of United States wood products into regulated construction markets"*, thus impeding market access (UNECE/FAO, 2003). Product standards, building

codes and other standards and regulations (e.g. health and environmental ones), which influence the use of timber for various end-uses, will continue to be a concern and would need to be continuously monitored. Even though there are fewer building codes and norms that directly (by law) hinder the use of wood in construction, there are often numerous indirect causes for disqualifying wood (e.g. extreme fire resistance and collapse-proof requirements). The European woodworking industry sees an urgent need to reveal such regulatory biases against wood and mitigate their impact on efforts to increase the wood usage in construction sector. (CEI-Bois, 2004)

7.7 Trade Impediments

There are other more informal impediments to trade in wood products. Bans and boycotts by local authorities and retailers for tropical wood products have become more common. They have often been targeted at either all of tropical wood, or more precisely, at the flow of uncertified tropical wood into the consumer marketplace. Since these actions are usually not a direct reflection of a government policy, it is difficult to prove that they would be discriminating under the WTO trade rules. However, WTO membership obliges national governments to keep actions taken by sub-national bodies in line with the government's own commitments (FAO, 1998). The two fronts have however moved closer e.g. in the UK, which puts more evident pressure on tropical suppliers.

Other trade impediments, which have the potential of becoming *de facto* barriers to the forest products trade include: a) export restrictions by developing countries to encourage domestic processing of tropical timber for exports; b) environmental and trade restrictions on production and exports in developed countries that affect international trade patterns; c) quantitative restrictions on imports of "unsustainably produced" timber products; and d) the use of "eco-labelling" and "green" certification as import barriers (Barbier, 1996).

All of these measures have been employed in recent years and have the potential to affect forest product trade flows more significantly in the near future. Many developing countries are resorting to export restrictions on roundwood and semi-processed products to support domestic further processing industries and to support exports of higher-value products. If planned improperly, this may actually cause losses due to economic inefficiencies and excessive costs of creating value-added.

Industrialized countries are already employing a variety of environmental regulations in their forest industries. These may be stand-alone regulations or come in conjunction with export restrictions; whatever is the case, visible trade implications may occur. If used intentionally for this purpose, such regulations may lead to discriminatory trade distortions. Increasingly, many of these countries are under domestic pressure to adopt quantitative restrictions to limit the import of "unsustainably" produced forest products. They may also consider imposing countervailing duties on imported products that benefit from an "environmental" export subsidy - i.e. "unsustainable" forest management that leads to deflated harvesting costs and thus lower export product prices. (Barbier, 1996).

With respect to the growing number of "eco-labelling" and certification initiatives applied to the forest product trade, generally, the aim of these initiatives is to distinguish "sustainably" produced forest products or to ensure that forest product imports conform to domestic environmental standards and regulations. Provided that such regulations and schemes are non-discriminatory, transparent and justified, are agreed mutually between trading partners or through multi-lateral negotiations, comply with GATT rules and conform with internationally recognized guidelines, then their potential use as trade barriers will be drastically reduced.

Forest certification is seen as a major instrument for making trade contribute to the sustainability of natural resources. Both consumption patterns and production methods are influenced through voluntary action towards reduced environmental impacts. From the market access angle, however, only single process and production method (PPM) issue is concerned, *i.e*. the quality of forest management. For labeling of products, differentiation has to be established throughout the chain-of-custody (CoC) from the forest to the final end user in order to correctly communicate the right information on certification.

All the above policy measures are fully legitimate for adoption, but their haphazard implementation often leads into trade distortions. This implies that their use should be more carefully pre-examined. International agreements and rules governing their use are largely missing. Indiscriminate and widespread application of these “smart” trade measures could potentially override the gains resulting from the Uruguay Round (Barbier, 1996). Soft policy

tools such as forest certification have probably a much stronger impact than what was foreseen during their earlier stages.

7.8 Certification and environmentally conscious buyers

7.8.1 Trends in markets' consciousness

Greening of consumers is taking place (slowly but inevitably), even if it is difficult to judge the pace, and to see what it means in actual consumption patterns in different parts of the world. The consumers have started to make their views voiced, firstly through their buying behavior, secondly, with legislation through political representation, and thirdly through the NGOs and the civil society in general. The last one appears to be the most vocal instrument at the moment. But the first one would provide the most lasting solution to induce a real change in the environmental consciousness.

In Europe in particular, green consumerism is heightening and most wood product retailers are beginning to require certified wood products, which is hoped to ensure both the sustainability of the resource base and the legality of its utilization. In this context, the Indonesian exporters of various products have encountered numerous problems in international markets. In fact, the Indonesian furniture exporters have reported incidents where the lack of certification has been used as a bargaining argument by importers to obtain lower prices (ASMINDO communication). There is a concern that in the future some countries may prohibit all imports of non-certified wood.

The weight given to the various objectives varies by country. For instance, in the case of Indonesia, the sustainable development argument is said to far outweigh the promotion of trade (Salim *et al*. 1997), while in North America and Europe certification is probably mainly seen by the industry as a trade issue. The national LEI-initiative for a certification scheme has developed into an operating level, but e.g. plywood industry has expressed scepticism on its applicability. Only a handful of concessions are presently LEI-certified.

In order to make certification efforts pay back, markets that favour "environmentally-sound" forest products through higher retail prices need to exist. The genuine consumer-driven demand for certified wood products is unclear, and is poorly surveyed or undocumented at the moment.

Trade intermediaries, particularly do-it-yourself (DIY) retailers in Western Europe, have been catalysts to move markets towards certified products. Moreover, a recent study conducted in the UK suggests that the demand is more driven by DIY chains (sometimes under pressure from international environmental groups) than by individual consumers, who still rank price, quality and utility of wood products up-front in the purchasing decision. Other surveys among consumers have revealed that there does not exist much willingness to pay premiums for certified wood products. This is a serious issue and casts doubt on the financial viability of certification for smaller producers and developing countries in general. (UNECE/FAO, 2003)

The slack consumer demand for certified wood has been acknowledged by the leading certification schemes, and they have tried to influence the authorities and the public by promoting various restrictive procurement rules in the key wood markets. In the UK, for example, the government has endorsed a step-wise approach to ensure first the legality, and secondly, the sustainability of products obtained through public (government) procurement of wood products. The Danish Ministry of the Environment has recently acknowledged the Malaysian MTCC scheme eligible for their public procurement – if supporting CoC certificates are issued. Moreover, the G8 countries pledged their commitment in 2000 to procure wood from "legal and sustainable sources". There are several examples of national, regional and even very local level campaigns and purchasing policies that are particularly focusing on stopping trade in tropical timbers that does not carry a certificate of sustainability or legality.

Softwood based products have been more easily certified than those of hardwoods. Tropical hardwoods are even more difficult, since they need individual attention to species and it is usually more difficult to ensure uninterrupted supply of certified tropical hardwood with uniform quality and sustained commercial volumes. Plantation forests could offer some relief on these pressures, as a sustainable and environmentally benign alternative, if they are well managed and avoid immediate conversion of remaining natural forests. Plantation timbers such as rubberwood (not actually a forest tree in most countries) and eucalyptus have made market inroads, becoming the first certified hardwoods with larger volumes. It is very likely that plantation wood will continue to gain prominence in the raw materials and wood products and furniture markets across Asia – mainly due to natural forest depletion and international

environmental pressures. Certification should be harnessed to strengthen this development as a complementary, but potentially strong market-based tool. (FAO / ITC, 2002)

7.8.2 Certification, labeling and potential impact on market access

The goal of certification is to link trade in forest products to sustainable management of the forest resource, by providing buyers with information on the management standards of the forests from which the timber for their purchased wood products originates. The specific local conditions of the country make the certification prosper or stall. The ownership of forests, the social environment and the markets being served all influence the prospective for achieving certification in a country.

Most countries that are involved in the development, testing and implementation of criteria and indicators are likely to also trade with certified products. Rather conveniently, many countries have chosen to use the international criteria and indicators as a safe starting point for their certification development. A number of producing countries who are members of ITTO have used the C&I of ITTO for the Sustainable Management (SFM) of Tropical Forests; other countries have used the Pan-European or the Montreal Process, *etc*. Almost all have taken a note of the Forest Stewardship Council (FSC) Principles and Criteria and made efforts to ensure a degree of compatibility.

Tropical countries were originally targeted as becoming the prime beneficiaries of certification. In reality, tropical countries have been met with a very slow progress in certification (Eba'a and Simula 2002). The main reason has been the un-bridged gap between the actual condition of forest management and the defined criteria. Moreover, the tropical countries undoubtedly suffer from shortcomings in the know-how, resources, institutions and to some extent commitment by governments, for launching certification. In many situations it is still uncertain whether certification is necessary or if alternative set of local measures would ensure greater sustainability.

7.8.3 Certification: remaining challenges

The relationship between certification and trade includes the question of whether certification is necessary or desirable for forest management reasons and whether it can provide tangible market benefits through market share, price premiums, etc. Judgements about the desirability of undertaking certification, who would do it, how it would be done, and whether it is a government or private sector responsibility, vary between countries. Certification is being promoted for several reasons, from marketing to forest management (Rametsteiner et al 1998).

Although by itself certification is unlikely to ensure sustainable forest management, it does have the potential to encourage efforts towards sustainable practices, which has been recognized by several international forums. There are a number of potential benefits, and also some disadvantages. The main motivation of those undertaking certification at present is more for marketing than for forest management reasons, *e.g.* to gain an advantage over other suppliers in some ecologically sensitive markets, and for market access reasons.

The debate should focus on improved, sustainable management of those forests that are presently threatened. Interest in certification as a marketing tool is only of significance if it can play a major role in meeting this goal. If it cannot, then certification is a tool that should be left to private interests if useful. The SFM goal implies that all forests are better managed, not to ensure that only those that can meet certification standards are recognized.

The effectiveness of the certification in achieving its fundamental objective is not yet proven, i.e. (i) to improve forest management and (ii) to ensure market access. It needs to be recognized that certification is not a sufficient condition alone to achieve these objectives, and can only play a complementary role (Baharuddin and Simula 1994). In addition to these specific objectives, environmental labeling responds to the consumer's interest in exercising buying preferences and managing the environmental impacts of consumption, as well as the right to information about products that the consumer may be interested in buying.

There are still a number of unanswered questions on certification, including (cf. Eba'a and Simula 2002):

- What is the market for certified products? It remains unclear as to whether there will be a genuine demand for certified wood or whether a price premium is likely. The current growing demand in some countries has been largely pushed by the distribution chain rather than pulled by final consumers. Price premiums are reported in some cases but are unlikely to remain when certified products become available in large quantities (mainstreaming effect).
- How will certification contribute to improving forest management? Only 8% of the world's certified forests are found in the tropics.
- Which system of certification is most appropriate? In many countries this is one of the major issues that are under debate.
- How to encourage mutual recognition between different certification systems? Certification schemes and certification bodies working under them are competing with each other in the market place.

The World Bank has agreed with leading international conservation agencies that it will encourage the widespread use of internationally agreed criteria and indicators for SFM. In supporting independent certification, the Bank will not endorse any one particular approach to certification. However, in the absence of any broad stakeholder consensus on the acceptability of a particular system, the Bank in its draft forest strategy (World Bank 2002) has adopted a set of principles and criteria to assess the adequacy of different certification systems.

7.9 EU initiative on Forest Law Enforcement, Governance and Trade (FLEGT)

7.9.1 Background: illegal logging in Indonesia

Estimates of the quantity of illegal logs in Indonesia vary considerably and range from 25 mill. to 57 mill. m^3 annually, from 52% to 70% of total log production. The EU/MoF Forest Liaison Bureau Newsletter 3/2000 estimated that 50 mill. m^3 of wood consumed in 1999 came from illegal sources. Some claim that cross border smuggling alone may account for about 10 mill. m^3. Malaysia, China, Vietnam and India have been implicated by GOI as recipients for smuggled timber. In 1998 illegal log production, in a total production of 77 to 79 mill. m^3, amounted to an estimated 57 mill. m^3, while the AAC for Indonesia was of the order of 20 to 22 mill. m^3 (Callister, 1992; Telapak, 1999; Scotland et al, 1999; Dudley, 2000).

The illegal logging in Indonesia's two largest land masses, Sumatra and Kalimantan, has been especially serious and the World Bank estimates that harvestable forests could be completely

wasted by 2015 (Brann 2002). MoF has published data on occurrence of illegal logging and timber smuggling in Papua, Kalimantan (East, Central, West), Sulawesi, Riau, Aceh, North Sumatra, and Jambi. As an example, Papua province allegedly loses some 600,000 m^3 of smuggled timber with a financial detriment of IDR 7,2 bill. per year (Study on Discrepancy…DEPHUT, 2003). From Northern Java, an estimated 500,000 m^3 of smuggled timber is exported from the country, representing around IDR 5,4 bill. losses to the nation. The frequency of illegal trade from Northern Java is about 500-700 ships per month. This implies that the logistics are well organised, and so smuggling should hardly go unnoticed.

7.9.2 EU's and Indonesia's response

Illegal logging and related trade poses a growing problem with negative economic, environmental and social implications, and combating this issue has become a priority for the European Commission. EU committed itself to action for this goal in the 2002 World Summit for Sustainable Development (WSSD), in Johannesburg. The European Commission adopted an EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) in May 2003. European Union Member States endorsed the Action Plan in October 2003, giving the Commission a mandate to begin implementation.

FLEGT defines a process and a set of measures through which the European Commission proposes to restrict illegal logging and related trade. The key strategies are to provide support for improved governance in wood-producing countries and to introduce a licensing scheme (TLS) to ensure that only legal timber enters the European Union.

The timber licensing scheme would be implemented through a series of voluntary partnerships with wood-producing countries. In order to facilitate the submission of a draft Regulation on FLEGT to the European Parliament, an extended impact assessment was launched to test the economic, social and environmental consequences of the timber licensing scheme. The final assessment report was submitted to the Commission in May 2004. Case studies were carried out in three potential partner countries: Brazil, Cameroon and Indonesia.

The workshop in Indonesia was held on 14th April 2004. The impacts on key stakeholder groups, such as wood importers and the domestic wood processing industry were duly considered. The feasibility of technical options (e.g. log tracking) was assessed.

In the field of law enforcement and under the FLEGT umbrella, GOI has already established the following initiatives in collaboration with the international community:

1. FLEGT collaboration with the EU
2. MoU between GOI and the UK on combating illegal timber trade
3. Asian Forest Partnership Initiatives
4. MoU between GOI and Government of China
5. MoU between GOI and Government of Norway to improve forest law-making and law enforcement to combat illegal logging
6. MoU between GOI and Government of Japan on combating illegal timber trade

7.9.3 Results of a FLEGT stakeholder workshop in Indonesia

The following pertinent outcomes were recorded from the workshop discussions:

1. The lack of exact form of the TLS appeared to cause confusion among the participants as to what the scheme entails and what the impacts are expected to be. Most of the participants wanted to know the details of the scheme before taking a position and giving inputs and suggestions on the methodology and preliminary results.
2. The effectiveness of the scheme to reduce illegal logging in Indonesia was seriously doubted. This implies to the narrowly defined TLS without other countries such as Malaysia, China, Japan, and USA. This can be partly addressed under the FLEGT Asia's regional umbrella. Broadening of the product scope by including plywood & veneer as well as pulp and paper was suggested.
3. Most participants expect some benefits of the scheme on strengthening sustainability, not just legality. The time frame is significant concern as now a stepwise approach to SFM and certification is still on the starting phase, guided by WWF and other NGOs. In defining "legal" timber it may be useful to apply the multi-stakeholder definition, which has been proposed under collaborative study between TNC (The Nature Conservancy), DfID (Department for International Development, UK) and WWF, on Indonesia.
4. There appeared to be a wide-ranging consensus among most stakeholders on the need to move towards sustainability, including legal verification. But the issue is highly sensitive and seems to lead into protective positions taken by some stakeholders like BRIK. Their vested political and economic interests were vocal in the workshop.

The workshop noted the timeliness of tackling the problem from Indonesia's point of view. Indonesia has been put into limelight on the issue of illegal and unsustainable logging even more than before. European trade intermediaries have launched boycotts and campaigns against using wood products from Indonesia.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Preface

8.1.1 Structural adjustment needs in Indonesia's wood products exports

Structure and concentration of Indonesian wood product exports were evaluated to identify the position of each market share of the products exported to the world market. It was concluded that plywood was the dominant single export product. Indonesian secondary wood products had, however, a significant share in Indonesian exports of wood products (more than 40%). The price competitiveness of Indonesian wood products was relatively high but still the majority of the products tended to lose market share (in individual markets) over time despite growing total exports.

Import tariffs on especially plywood and some other products tend to be relatively high in some major importing countries. There have also been intensifying campaigns on environmental issues in major importing countries (EU and USA) asserting that the wood products traded must be made of raw material legal and come from sustainably managed forests. Demands for certification of forest management, chain-of-custody and legality will not be met without additional costs.

The production costs of Indonesian wood products tend to escalate as a result of log price increases (problems with availability and access) and other financial burdens such as those stemming from the economic reforms taken since 1998. Especially the new emerging levies at district levels and oil subsidy reduction have a role to play. The increase in log prices is mainly due to high competitive use of logs by wood industries oriented for exports. It has been exacerbated by the more frequent local log supply shortages and illegal log exports.

This suggests that the existing marketing strategies for wood products should be adjusted to current realities and future development trends. The log export ban policy may well support the price competitiveness of Indonesian wood products, but it comes with side effects such as persistent structural oversupply, and a dampened product image unless logs originate from sustainable forestry. The effect of harder price competition and relatively high tariffs for some products suggest that wood products industry should consider a processing technology upgrade to meet the challenges on the availability of logs, and to acquire maximum benefits of economies of scale (in primary processing) and increase processing efficiency. The growing environmental concerns suggest that log supply should depend - without exceptions - on sustainable forestry, verified with certification and communicated through labeling. The role of plantations should be emphasized.

8.1.2 Effects of trade restrictions on competitiveness of Indonesian wood products exports

Effect of trade restrictions on the market access and competitiveness of Indonesian wood products may be categorized based on sources of restrictions. First type of restriction is coming from policies introduced by major importing and/or competing exporter countries. Second type of restriction is due to Indonesia's own interventionist trade policy.

Theoretically, trade liberalization expands the volume of economic activity, and especially that of trade. Many studies lend support to one of the basic assumptions of trade liberalization, that most of the consumers (predominantly in industrialized countries) will enjoy lower prices, what contributes to higher welfare. This benefit is partly shadowed by the fact that sometimes producer country consumers may not gain at all. The producer country welfare may even have a tendency of going down instead of increasing.

There is no clear mechanism of compensation from those who gain to those who suffer, what underlines the problematic of equal sharing of benefits and revenues of liberalizing world trade. Regional trade agreements (with tariff reductions) do have similar volume enhancing and price reducing impacts, but to a lesser degree and less consistently.

On Indonesia's case, it is likely that opening up makes the exporters more vulnerable to the harsh realities of the competitive international markets. In Indonesia, where forest resources are dwindling, the trade, industry and forestry sector in large are prone to suffer. On the

contrary, trade liberalization may open up new opportunities if the country has rich resources and competitive production factors (e.g. New Zealand).

8.2 Conclusions on international market, prices, substitution and competition

9. A global mega-trend in the 1990s was that exports of primary processed wood products from tropical forest declined, while exports of further processed products mushroomed. International trade of value-added wood products, and especially furniture liberalized, thereby increasing the import component of consumption, and creating more export opportunities for developing countries. International trade in furniture, BJC and profiled wood reached a total value of $33.7 bill. in 2000, up by 27% from 1996.
10. Indonesia is a significant supplier of many tropical forest industry products to diverse foreign markets. Based on COMTRADE data for 1998-2003 period, however, Indonesia has been losing market shares in many product categories, and mainly to China, in the recent years.
11. The biggest export values (and market shares in world imports – see brackets) were recorded in: tropical plywood – excluding blockboard & other laminated panels - $1523 mill (37,4%), chemical wood pulp $866 mill. (7,1%), ”other” wooden furniture $677 mill. (5,9%), sawn hardwood $523 mill. (9,3%), wooden seats $267 mill. (3,6%), wooden bedroom furniture $200 mill. (4,6%), rattan & bamboo seats $169 mill. (48%), profiled hardwood/mouldings $167 mill. (14,8%), assembled parquet, concrete shuttering, other BJC $144 mill. (4,4%), wooden doors & frames $120 mill. (7,5%), carvings $60 mill. (5,3%).
12. Indonesia ranked No. 1 as the source of tropical plywood and rattan and bamboo seats, and No. 2 in sawn hardwood, mouldings/profiled wood, and also in carvings and wooden doors. In other products Indonesia was usually among the 5-10 leading suppliers.
13. International market prices for most commodity products have remained depressed since the late-1990s, aided by the shock correction by the Asian economic crisis, and subsequent devaluation of the South-East Asian currencies, including rupiah.
14. Around 30-50% lower prices are recorded for Indonesia’s and Malaysia’s exports in 2001, compared to 1997 (FOB-basis researched by ITTO). A gradual recovery took place in 2002, and Q1-Q2/2004 showed some faster price hikes due to freight increases and physical constraints of supply.

15. Price comparisons on importer side showed that in most products, Indonesian exporters received lower than average prices for their products. US dollar-nominated price discounts tended to be the widest in labour-intensive products like carvings, doors and wooden bedroom and "other" furniture. On the contrary, Indo tropical plywood seems to have secured a price premium over competitors.
16. Exchange rate fluctuation has been an important catalyst for Indonesia's exports. During 1997, rupiah's fall fattened the profit margins of foreign currency-priced exports. This was most visible in wood pulp exports, where production costs were cut to almost one third, while international market price (Dollar & Euro denominated) remained firm.
17. Product substitution has been most frequently reported for Indonesian plywood by MDF (drawer backs), OSB, softwood plywood (structural plywood), and gypsum panels for ceilings. In Japan, packaging plywood has been losing ground to OSB. On wood material substitution, some plantation wood species have potential to push the natural tropical wood products "off-the-curve" into maturity and decline in their product life cycles.
18. The closest competitors of Indonesia come from within the South-East Asian region and China. Wood species and products offered tend to be similar, and international buyers treat the region as one supply base (particularly in furniture). Substitution happens easily between supplier countries on price versus quality reasons, and between products that serve the same end-uses (plywood losing ground to other panels), and between utility species (e.g. ramin vs. rubberwood). Engineered wood products and new processing methods can cause substitution.
19. Indonesian products still rarely compete on the highest market segments (prime products) because of quality constraints and insufficient product innovation. Value-added plywoods are an exception, as Indonesia has been able to meet the stricter quality requirements e.g. in the Japanese market. Wood carvings are a product group where Indonesian products are placed in the high-quality end of the market, but fetch only heavily discounted prices.

8.3 Conclusions on trade trends, barriers and competitiveness of Indonesian hardwood products

3. Between 1998 and 2002, Indonesia had been able to increase market share only in sawn hardwood, chemical wood pulp, wooden bedroom furniture and "other" wooden furniture. In other products it lost market shares, notably in profiled hardwood/mouldings

(down 11.2%-points) and in tropical plywood (-7.4%-points). Market shares had slid downwards in all the other products.

4. Indonesia's deliveries of the studied nine forest product groups increased by $653 mill. over the period 1998-2002. Indonesia was not able to optimally keep pace with the booming trade, as its market shares typically fell at the same time.
5. The fast-growing export delivery from China was the single most important factor behind Indonesia's loss of market shares. China's market shares had risen particularly in the following products: wooden bedroom furniture (up 21.5%-points), wooden carvings (+15.1%-points), "other" wooden furniture (+12.7%-points), wooden seats, (+9.4%-points), profiled hardwood/mouldings (+8.8%-points), tropical plywood (+4.6%-points). It should not, however, be misinterpreted as the sole reason for Indonesia's falling trade performance.
6. While tariff barriers have been lowered, informal and non-tariff measures have been increasing, affecting Indonesian exporters significantly e.g. through FLEGT initiative and certification demands. NTMs more severe for developing country exporters, who aim at the markets of the developed countries, than *vise versa.* This is especially true for developing countries trying to enter the "rich" markets (Canada, EU, Japan and USA).
7. Measurement of Indonesia's competitive advantages in forest products in the international trade through indicators like private cost ratio (PCR), revealed comparative advantage index (RCAI), and constant market share (CMS) gave somewhat contradicting results. PCR showed that sawnwood had a better competitive advantage than plywood or mouldings. RCAI results indicated that plywood enjoyed of a great competitive advantage, even though RCAI of plywood declined between 1997-2001. Sawnwood was less competitive in the world markets, but its RCAI clearly improved over the years 1997-2001.
8. In the case of secondary processed wood products bamboo/etc seats/chairs, wood carvings, "other" wood furniture, and wooden bedroom furniture all showed a high and increasing RCAI. Their results indicate ever-improving competitive advantages in the world markets.
9. CMS analysis of plywood export growth to ten major importing countries implied mixed reasons for Indonesia's success. Plywood export growth in 1998-2001 was attributed to real competitiveness just in three countries, Canada, France, and the UK. Indonesia's plywood export growth to China in 1998-2001, was mainly (94.15%) caused by general

increase in import demand, and just a small 5.85% part of its export growth was attributed to competitiveness. Additionally, CMS analysis concluded that sawnwood export growth in 1998-2001 to ten major importing countries was principally attributed to its competitiveness in just five countries.

10. GOI has imposed log export ban for the time being. Primary and further processing industries enjoy cheaper prices of wood raw material than they would under foreign competition, so the government loses a relative share of revenue (royalty). This policy may help maintaining the inefficiency of primary and further wood processing industries, and should be reconsidered.
11. Under free market mechanism of logs (no export ban or no export tax), Indonesia's sawnwood industry would work profitably. Alternatively, imposition of export tax as much as 10% on logs would increase the profitability of sawnwood industry up to 14%. The higher the export tax on logs, the higher the profitability of the sawnwood exporters.
12. The profitability of plywood industry will be negative under free market mechanism. If 10% export tax is set on logs, it results in the profitability of plywood industry improving by 28%, but still remaining in red. This implies that the plywood industry needs domestic price protection of logs, unless it undergoes a major restructuring.
13. Based on the dynamics of the development in Indonesia's wood industries since the 1980s, one can say that its position reflected comparative advantages. But these have a limited lasting (as long as low-cost resources existed widely in the country) - and not yet anything of a kind of dynamic competitive advantage that should be its target – is in sight.
14. Plantation woods mature in many countries in Asia-Pacific to fill the deficits in the availability of wood from natural forests, and in fact are seen to supply most of any incremental wood usage in the future. Indonesia should try to embark on this trend, since at least mediocre wood properties can be achieved from many plantation woods, and there is ample potential for overcoming the more serious quality handicaps through immediate improvements in wood drying, jointing and edge-gluing technologies, and wood preservation and finishing of products.
15. Efficient harvesting and low mill-gate price of plantation wood will prevail in primary processing; together with low labor cost it confers initial competitive advantage to producer countries. Part of the gains from lower raw material costs will be passed to the final consumer as inexpensive products, and this will increase the competitiveness of the wood products in the market and probably reduce the rate of substitution of wood by

synthetic materials. In absolute and relative terms profit margins at the producer side will decline further, what calls for more domestic further processing to capture value added.

8.4 Linkages with existing policy frameworks

Policy discussion should evaluate the existing legal and policy framework on forest products exports, legality and control measures over trade, such as:

1. Relevant parts of Forestry Act (Nr. 4/1999).
2. PROPENAS 1999 – 2004 (National Development Program, State Policy Guidelines under Reform of Government Administration): Law 25/2000.
3. Joint decree of MoF and MIT No. 1132/Kpts-II/2001 and 292/MPP/Kep/10/2001 concerning log export ban.
4. Joint Decree of MoF, MIT, and Ministry of Transportation (22.01. 2003) on Forest Industry Revitalization Body (BRIK), which aims to curb the illegal log exports, and to control the export process.
5. Investment policies and industry restructuring as a part of IBRA's (Indonesian Bank Restructuring Agency) mandate.
6. Indonesia's international commitments under the multi-lateral environmental agreements (MEAs): study the trade-related aspects carefully to reveal opportunities to re-label some of Indonesian exports with community empowerment, poverty alleviation and "green" or fair trade credentials.
7. National legislation and building codes to review possibilities for using more structural timber products to re-vitalize the domestic markets for wood.

Moreover, it has to realized that the forest sector is influenced by external policies such as those for the environment, agricultural expansion and land conversion into cash crops. Also, a keener attention should be paid to the linkages between policies governing the raw material issues, processing industry and trade inside the forest sector. A better integration between these policy frameworks could be achieved by rooting the concept of value chain assessment more firmly into the minds of the policy-makers. Its major benefit would come in the elimination of inconsistencies between the three levels (resource, industry, trade).

8.5 Key issues for policy consultations: international trade perspective

8.5.1 Questions and answers

The following key questions for policy-making were collected from the two sub-studies and discussed during the Retreat of the Consultants' Group (April 8th, 2004). Reflections of the analysis are suggested as tentative answers.

8. Does the international market pose limitations to Indonesia's forest products exports? *Less from the quantitative point of view, but more from the qualitative point of view. Markets (demand) keep growing and Indonesia appears quite price-competitive, but the promising trade opportunities are inhibited by more stringent environmental and legality requirements.*
9. Does Indonesia explore new markets actively enough or have some countries or niches gone unattended for? *Indonesian industry appears to be a passive price and order taker and does not very proactively explore new markets, or adjust products to diverse exports.*
10. Is the present structure of exports economically optimal, i.e. does the raw material get routed competitively to the industry that has the best wood paying capability for it, provides high value added on it, and generates "enough" of foreign exchange of it? *Roundwood market is a captive one, where competition and dynamism has been eliminated. Industry branches are not working transparently, so wood paying capability and profitability levels do not unfold easily.*
11. Is the present structure of exports sustainable, i.e. operates profitably, shares revenue for societal benefit, provides employment, and not to the detriment of the environment? *By definition and through empirical evidence, it is not sustainable.*
12. Is Indonesia a price taker or an active market developer with enhanced power thanks to its high market shares? *Indonesia still holds a strong influence in plywood trade, but in general it lacks concerted market development efforts in most of the other products.*
13. Should there prevail stronger policy and economic incentives to support secondary processing and higher value-added products? *Generally the answer is yes, but one should not ignore the adverse impacts on primary processing and the challenge to develop secondary/tertiary processing. Benefits would outweigh problems in the long term.*
14. Should Indonesia seek to transfer from natural tropical wood into plantations-based exports? *It will be inevitably compelled to do so, but still the returns on the most valuable*

tropical wood that can be sustainably harvested should be maximized. Processing and products need adjustment during the transfer onto the low-cost plantation wood segment of the markets.

8.5.2 Strategy steps

8.5.2.1 A break-away from status quo

1. GOI should decide whether it wants to continue pursuing centrally-planned industry restructuring, where failure is on hand already.
2. Evaluate options: rely fully on market forces, or aim at central/local government controlled restructuring by fostering domestic demand, or supporting value-added processing for exports.
3. Choose supporting action: decisions to maintain, modify or remove Indonesia's trade restrictions and export taxes on wood commodities.
4. Admit and re-evaluate the failure of incentives for plantation establishment, and debt restructuring.

8.5.2.2 Permanent change of course

1. Intensify marketing, product placement and distribution channel participation in order to find more remunerative markets and new trade opportunities.
2. Reduce existing export industry capacity to reflect resource constraints, re-train exporting community away from mass-market supply (export diversification and gradual downscaling).
3. Consolidate the fittest exporting companies into stronger and fewer players; enhance integration and alliances.
4. Create long term strategy and incentives to move away from primary processed wood product exports to that of secondary processed products ("earn more with less").
5. Re-orient part of export flows towards domestic market, which is coming under intensifying foreign competition, partly supplied by products manufactured abroad of illegal logs from Indonesia.
6. Guide the industry towards plantation-based raw material supply and mixed raw material stock to optimize remaining resource, and if feasible, import the deficit.

8.6 Key issues for policy consultations: competitiveness and trade policy perspective

8.6.1 Questions and answers

8. Is Indonesia's loss of market shares an indication of eroding competitiveness or just reflection of China's emerging role as "the factory of the world"? *Both, as Indonesia's labor productivity is probably falling further behind that of China, Vietnam, etc. Indonesia has few means to complement such a loss, as its raw material base is breaking.*
9. Is Indonesia losing ground in the international trade foremost due to resource constraints, environmental image, or product quality (standards)? *The order seems correct, but all are inter-twined and solution must address all of these hindrances.*
10. Are Indonesia's exporting procedures and exporters as prone to illegality as perceived in the international markets? *Yes (but generalizations are to be avoided): the Report on Trade Discrepancies is a warning signal and would call for immediate action. In addition, there are reportedly escalating port handling fees that can not be justified. Inefficiency, red tape and corruption are often mutually reinforcing.*
11. Has Indonesia adapted its export products and industries sufficiently to become more competitive in the international markets (is there still room for "organic" improvement without major industry restructuring)? *Product adjustment and product placement is rarely done, so room to do so in the future is vacant.*
12. What are the key tariff and non-tariff measures and other market access hurdles that steer Indonesia's role as exporter and source of imports? *There are less gains achievable from lowering of tariffs (much of the liberalization has been done), but NTMs will continue to evolve, as Indonesia's experiences with the recent CITES-listing of ramin and importer boycotts in Europe would implicate.*
13. What is the optimal blend of export taxes, fiscal incentives and other measures for allocating efficiently wood products with different degrees of value-added between domestic and export markets? *Experiences from most countries would indicate a free market mechanism leading to the greatest efficiency. A key question is whether GOI has the courage to allow it, and what type of buffers are needed to iron-out imperfections.*
14. How can Indonesia make a balanced choice of policies between log export ban, exports with a tax regulation, and unregulated trade under the on-going trade liberalization

processes? *Economic impact assessments with appropriate sensitivity analyses, would prepare ground for such an endeavor: long-term consistent policy guidance has to be chosen instead of ad hoc measures.*

8.6.2 Strategy steps

8.6.2.1 A break-away from status quo

1. Indonesia should abandon its historic specialization in international trade on the basis of primary resource endowment (labor, raw material, energy) – as this reflects a static approach. Instead it should accept competitive advantage as a dynamic target, relating to the set of institutions and economic policies supportive of sufficient rate of economic growth – motto: national prosperity is created, not inherited.
2. There are three transitions to be made: (i) from traditional specialization to factor-driven competitiveness, (ii) to investment-driven competitiveness, and (iii) innovation-driven competitiveness.
3. Consider phasing out log export ban and opening the domestic log market to legal external competition (industry enters free competition for logs).
4. Adopt a new company taxation and investment policy, which would encourage further processing before exports.
5. Embark more determinedly on forest certification and verification on legal origin of wood to shrug off the reputation of "environmental plunder" from Indonesia. This requires improving the capacity to **verify and control** legality and sustainability of wood flow in trade (chain-of-custody certification, log tracking, etc.).

8.6.2.2 Permanent change of course

1. Carry out company audits and set screening criteria for a radical forest industry consolidation to escape "sunset industry" image: allow the weak links crack.
2. Strengthen industry associations and industry discipline to firm export prices in sectors where Indonesia is influential, but avoid market manipulation of the past.
3. Eradicate corruption in the wood supply chain and related tampering of trade documentation. Reduce red tape, streamline inefficient export procedures and services.
4. Establish a new body or strengthen an existing one to assume the task of being a transparent, third-party accredited verification body for **legality**. This is an urgent task.

5. Supporting action: apply for maximum support (technical, financial) from the EU and other trading partners willing to help implementing better forest law enforcement, governance and trade initiatives (under FLEGT umbrella).
6. Embark on foreign joint ventures, investments and transfer of technology and know-how to save the fittest part of the industry, and "import sustainability" if needed.

8.7 Illustration of discrete strategy alternatives

8.7.1 Goal for strategy development

The overriding goal of a new trade/market-based strategy for the Indonesian wood-based industries could be defined as follows.

"To help Indonesian wood-based industries adapt to the changing economic, societal and environmental conditions of the trading community in abroad and domestically, and operate profitably based on flexibility, increasing net value-added, and undistorted competition."

8.7.2 Strategy selection matrix

An illustrative matrix developed for the Study C is presented in Figure 8.1. It owes credit to the conceptual work done by Study A by Dr. Thomas Waggener. All three Study Groups adopted the same type of matrix, each one adjusting it to the specific details of their study area. Finally, the similar structure would allow a systematic integration between the three areas into one coherent set of final joint strategy proposals. This strategy matrix aims to answer are restricted to "What" and "Who" and not "How" and When". Affirmative guidelines for implementation should be the following step after the desired strategy alternative(s) has been adopted.

The crucial elements (left-hand column) that define the strategy were outlined on the basis of the key arguments defined in the contents of the Technical Report C: International Market Analysis. The first one was looking at the demand dynamics both on the international and domestic markets. The second element was built around Indonesia's current export mix, defined at product and market segment/country level. The third element considered Indonesia's competitiveness measured against pricing, product quality, labor and profitability/net value added. The fourth and final element was trade policy and restrictions posed either by the country itself (earning of foreign exchange, export taxes and fees) or the

international markets (demands for legality, certification and similar restrictions). The criteria for comparing (ranking) the elements in each alternative strategy were considered to comprise the ones outlined in Table 8.1. The three common dimensions of each criteria have been explained.

The various **actors** that actually influence the elements of the strategy are listed inside each cell of the matrix. These range from customary domestic players like the provincial or central governments, industry and its associations, to external forces like the international competition, trade intermediaries and standards. Also the role of the economic stabilization measures imposed by the World Bank and IMF, and the influences of domestic and international non-governmental organizations are to be considered. Their relative power is assumed to change under different strategy alternatives.

Table 8.1 Criteria for the comparison of strategy alternatives

Criteria	Dimension	Criteria	Dimension
1. Sustainability		*6. State (Owner) Revenue*	
	- economic		*- export taxes*
	- ecological		*- income taxes (employment)*
	- social		*- economic activity*
	- legality		
2. Profitability		*7. Regional Employment / Development*	
	- value-added		*- local economy impact*
	- revenue flows		*- infrastructure impact*
	- equitable sharing		*- stability*
3. Flexibility/Adaptive capacity		*8. Human Resources Capacity*	
	- market turbulence		*- labour skills*
	- local vs. international needs		*- managerial skills*
	- industry evolution		- training capacity
4. Cost-Capital Investment		*9. Institutional Capacity*	
	- needs to upgrade industry		- trade promotion / industry associations
	- foreign vs. local technology		- industrial support services
	- foreign vs. local investment		- research & development
5. Efficiency			
	- resource efficiency		
	- economic efficiency		
	- technological efficiency		

8.7.3 Alternative strategies

In Study C, the **"Status Quo"** is defined as **promoting primary exports, while ignoring domestic market development** (second column from left). It serves as an attempt to capture the current situation, which is a mixture of a market economy and regular government interventions, which have caused distortions in the log and plywood market in particular. The

looming sawnwood export ban would be a blueprint of this strategy. The continuation of the Status Quo is not be an option for future.

The first "new" strategy alternative is called **"Domestic Market Focus"**, which means essentially a concerted effort to **foster domestic demand at the expense of exports**. It has been estimated that at least one third of the forest industry output is being consumed on the domestic market. A legitimate question here would be whether Indonesia has short-lived its development potential of domestic wood usage, and what it could do to turn the situation around. Import substitution would have a positive effect on Indonesia's balance of payments situation, but the loss of export revenue would be scare the industry off. The industry is undoubtedly totally against such a strategic turnaround, as it would bring about both a strict export regulation and a drastic revenue fall. Hence, this option is not likely to merit any serious consideration by the policy-makers.

The second strategy alternative **"Value-added Exports"** goes some steps further in the sense that it is built around the goal of **encouraging only those exports that can be considered to have a high (net) value-added component**. This would warrant a closer consideration, because the multiple benefits of further processing could be theoretically best captured under such scenario. A number of tropical countries have taken on this path, but rarely with immediate success or without casualties. Further processing can be either strengthened by helping existing producers to grow, or by encouraging new producers to enter the business from the primary processing segment. This stiffens internal competition and has a healthy effect as it most likely culls the non-competitive players from exports. Mutually reinforcing approach would be to support industry integration (vertical / horizontal), i.e. the creation of stronger alliances between sub-segments. A useful tool in conceptualizing this would be value chain assessment across the forest sector.

The third strategy alternative differs more distinctively from the previous ones. It is defined as **"Undistorted Free Market"**, whereby only **the smallest necessary (safeguarding) measures under the WTO / AFTA trade regimes would be applied to guide trade**. The possibility of trade-distorting interventions by the government would be barred. As the most liberal alternative, this strategy will initially stir resistance among many policy-makers. But it would also guarantee the clearest recipe for change, and importantly, it would work in two

ways, i.e. **bring market-driven development to both exports and imports**. There would not be much scope for proposing a "heavily importing market strategy" alone. Undistorted free market approach would guide the necessary imports, too.

Recommendation:

It would appear realistic to propose that the third option would be picked to provide a solid base for a notable change away from the current strategy. If implemented in conjunction with the goal of option two (lend support to value-added exports), it would have a better chance of succeeding the scrutiny and steer Indonesian industry on a more sustainable path.

Figure 8.1 Strategy formulation matrix for Study C

		1	2	3
Alternative Strategies	STATUS QUO Promoting Primary Exports, Ignoring Domestic Market Development	DOMESTIC MARKET FOCUS Fostering Domestic Demand, Regulating Exports	VALUE-ADDED EXPORTS Encouraging Value-added Exports	UNDISTORTED FREE MARKET Smallest Necessary Regulation (avoid intervention)
Strategic Elements	Long Term	Long Term	Long Term	Short term: AFTA / Long Term
DEMAND DYNAMICS				
International	Central gov't Industry Int'l trade/competition APEC, AFTA WB, IMF Int´l Standards JAS; CE; US	Province - Central gov't Industry Secondary Processors Indonesian Importers	Province - Central gov't Industry Int'l trade/competition Indonesian Importers Int´l Standards JAS; CE; US APEC, AFTA	Industry Int'l trade/competition Indonesian Importers Int´l Standards JAS; CE; US APEC, AFTA
Domestic	Industry Province - Central gov't	Province - Central gov't Consumers, Architects, Builders Secondary Processors Indonesian Importers Building Codes, Standards SNI	Province - Central gov't Industry Indonesian Importers	Consumers Indonesian Importers
INDONESIA'S EXPORT MIX				
Products	Province - Central gov't Industry Trade Intermediaries	Province - Central gov't Industry	Province - Central gov't Industry	Industry Trade Intermediaries Int'l trade/competition
Market Segments/Countries	Industry Province - Central gov't (Resource allocation, subsidies) Int'l trade/competition	Province - Central gov't Trade Intermediaries	Province - Central gov't Trade Intermediaries	Industry Trade Intermediaries Int'l trade/competition
INDONESIA'S COMPETITIVENESS				
Pricing	Prov/Central gov't (through royalties) Concessionaires Trade Intermediaries Industry (non-competitive)	Prov/Central gov't (price regulation) Concessionaires Consumers Industry (non-competitive)	Prov/Central gov't (through royalties) Int'l trade/competition Industry (competitive)	Industry (competitive) Int'l trade/competition
Product Quality	Industry (non-competitive) Concessionaires (Log Quality) Industry Associations Int´l Standards JAS; CE; US	Consumers Standard Bodies SNI Industry Associations	Industry (competitive) Int´l Standards JAS; CE; US Industry Associations	Industry (competitive) Trade Intermediaries Int'l trade/competition Int´l Standards JAS; CE; US
Labour	Province - Central gov't (economic policy, availability through transmigration) Industry (non-competitive)	Province - Central gov't (local economy support)	Province - Central gov't (through training) Industry (competitive)	Industry (competitive) Province - Central gov't (through training)
Profitability/Net value added (Efficiency)	Concessionaires Industry (non-competitive) Province - Central gov't (through resource allocation, subsidies)	Province - Central gov't (through resource allocation, subsidies)	Province - Central gov't Industry (competitive)	Industry (competitive) Int'l trade/competition
TRADE POLICY & RESTRICTIONS				
Foreign exhange, export taxes & fees	Central gov't Customs & Ports	Central gov't Customs & Ports	Central gov't Customs & Ports	Customs & Ports
Legality	Province - Central gov't (law enf.) Trade Intermediaries Int'l trade/competition Industry/BRIK	Province - Central gov't (law enf.) NGOs	Province - Central gov't (law enf.) Trade Intermediaries Int'l trade/competition Industry/BRIK	Province (law enforcement) Trade Intermediaries Int'l trade/competition
Certification & other environmental restr.	Central gov't - LEI NGOs Trade Intermediaries Int'l Conventions	Central gov't - LEI NGOs	Central gov't - LEI Industry Trade Intermediaries NGOs Int'l Conventions	Industry Trade Intermediaries NGOs Int'l Conventions

8.8 Ingredients for a conducive policy package to support strategy implementation

8.8.1 Guiding principles

It is appropriate to propose simple guiding principles for steering change in order to achieve the goal of strategy development and implement the actual recommended strategy. From the trade/market perspective, the essential guiding principles would include:

5. Legality (throughout the forest products value chain, from the forest to the markets)
6. Equal ability to compete (clear trading rules and non-captive market structures)
7. Transparency (access to market intelligence and accurate trade reporting)
8. Accountability (free markets reward efficiency, but penalize inefficiency)

8.8.2 Policy support for implementation

A wide range of policy instruments has been tried in various countries, including Indonesia, to promote increased and further processing (e.g. log export bans, minimum local processing quotas, differentiated export taxation according to the degree of processing, free trade zones, etc.). Without the creation of innovative support mechanisms and unbiased financial incentives, the agenda for income creation from, and sustainable use of, forests will be difficult to realize. Enabling economic environment, cultivation of entrepreneurial attitude and carefully targeted external technical assistance on structural weaknesses, could be the center pillars for enhancing the production capability and competitiveness of wood product exporters. Promotion of creative public-private partnerships (PPP) is equally important to pool scarce funds on e.g. research & development and its practical application into products.

The government policy framework should ideally ensure the following:

7. Consistent policy for supporting **sustainable and legal** raw material procurement and further processing instead of regulating it by complex rules and ad hoc restrictions.
8. Catalytic tax concessions or similar fiscal incentives to facilitate restructuring (to be phased out upon self-sufficient industry).
9. Consistent, transparent and predictable import and export regulations.
10. Rationalization of import tariffs on raw materials and equipment.
11. Improvement of transportation, communication and information infrastructure.

12. Strengthening of supporting institutional infrastructure for industries (associations, research & development institutes, education and training, export promotion offices, standardization, certification and labeling, verification body of legality, etc.).

The private sector should always assume the primary actor's role in putting the policies into a maximal use. Government's role in supporting export marketing tends to be more subtle, and private sector cannot be made dependent on it.

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Appendix 1. Case study on the development of the processing of coconut stem wood

BACKGROUND

This case study was first published in the "Topical Timber Products: Development of Further Processing in ITTO Producer Countries", a report published jointly by ITC and ITTO in 2002. The original draft was prepared by Mr. Antoine Bassili, the former head of UNIDO's Wood Industry Branch. The idea of including it in this Technical Report came from the Director of CESERF at the Consultants' Retreat in April, as one means of highlighting the potentials hiding in non-wood fiber plants of Indonesia.

INTRODUCTION

Coconut palms (*Cocos nucifera L.*) are found in most of ITTO producer countries. Their stems have been used traditionally as posts and poles in housing construction, while the crowns served as roofing material. There have always been other non-structural uses but these were minor.

In this day and age, when ecological considerations play a much more visible role than in the past, the fact that coconut is what might be called 'a plantation wood' is an asset in the marketing of the sawnwood. The use, where possible, of the stems of senile coconut palms relieves the pressure on natural tropical hardwood forests, especially in countries like India, the Philippines and Thailand. Here, drastic measures are being taken to protect the remaining forest coverage and even to bring it back to its former levels. While coconut sawnwood is unlikely to feature in world trade in large volumes, it could become a viable low-cost utility hardwood for use locally in the construction of housing in rural areas, as well as for lower-cost items such as joinery, or for school and domestic furniture.

RAW MATERIAL AVAILABILITY

The figures below serve to illustrate the potential importance of coconut stems as a raw material for the processing industries of many ITTO Asian member countries.

Total area of coconut harvested in all ITTO producer countries: 9,042,681 ha.
Total area of coconut harvested in countries other than ITTO members: 1,447,705 ha.
Total area of coconut harvested in all countries of the world: 10,490,386 ha.

Over 86% of the total area planted with coconut is in the ITTO producer countries.
ITTO Asian member countries represent 78.8% of the world's total.

Plantation density is highly influenced by the flatness of the terrain and the prevailing climatic conditions. As many as 120 trees per hectare are planted in the relatively flat and typhoon-free areas of Mindanao in the southern Philippines and in Indonesia. As few as 80 trees per hectare are planted in the mountainous areas of eastern Luzon in the Philippines and in southern India. A density of 100 trees per hectare may be taken as the world average. The usable stem volume can be as high as 0.9 m^3 and as low as 0.4 m^3, depending upon the coconut specie, soil conditions and environmental and climatic conditions prevailing in the plantation. A volume of 0.65 m^3 per tree is deemed average. Thus, the total standing volume in ITTO Asian member countries is of the order of 500 mill. m^3.

The common practice among coconut farmers in Asia is for them to consider a coconut tree to be senile and in need of replanting either when it yields less than five nuts every 40 to 60 days, or when the tree is so tall that ripe fruits break when they fall to the ground. Trees struck by lightning, blown over by typhoons or attacked by insects have to be replaced immediately. Senility starts to set in at 40 years. However, 50-60 years may be taken as the average age for replacement. After all the senile trees have been replaced it is estimated that the annual replacement rate is little more than two stems per hectare, or approximately 18.5 mill. stems in ITTO Asian member countries. Data from the production of coconut sawnwood for the two demonstration houses in the Philippines from 1983-1984 in the UNIDO and FAO projects, indicated an average volume of 0.9 m^3 per stem, yielding about 0.45 m^3 of sawnwood in the three grades (hard, medium and soft). This gives a potential volume for Asia of more than five mill. m^3 of sawnwood per annum.

PAST, TRADITIONAL AND POTENTIAL USES

Coconut stems are used in rural housing construction, for electric power and communication poles, for fence posts, foot-bridges, posts in small piers and for the production of shingles and crowns as low cost, non-durable roofing material. Once the trees have been sawn and treated, the denser sawnwood obtained (so-called hard grade, with a density of more than 600 kg/m^3 for the dry wood) can be used for structural components such as beams in housing, flooring, staircases, and shingles, etc. The less dense wood (medium grade, with a density between 400 and 600 kg/m^3 for the dry wood) can be used for non-structural applications, such as room dividers, etc.

The soft grade (density below 400 kg/m^3) is unfit for use in structurally loaded housing components. However, the two demonstration houses erected in the Philippines have shown that roofing shingles made from adequately treated soft grade coconut wood has a service life of more than eight years - comparable, cost-wise, to traditional roofing materials. Hard and medium grades have also been used

in furniture, tool handles, etc. and coconut wood's unique grain and colours have made it popular for decorative boxes, bowls and trays.

RESEARCH DONE ON PROCESSING

Research on processing of Coconut stems started in the Philippines in 1970. The Philippine Coconut Authority (PCA) created a Coconut Wood Research Centre in Zamboanga City to develop its use. At a later stage both FAO (from 1974) and UNIDO (from 1981) provided assistance, the latter in sawing, grading and promotion, including the construction of two low cost houses and a comparative cost study with traditional construction methods.

The Coconut palm, a monocotyledon, has a stem with a density on the surface (dermal) that is far higher than at the stem's core. Similarly, the density at the base decreases towards the crown. On average, using adequate sawmilling facilities and the log breakdown pattern developed at the PCA centre in Zamboanga, the sawnwood yield from each coconut stem may attain 70% hard, 17% medium and 13% soft.

This causes serious problems in grading the sawnwood produced. Because green stems have very nearly the same density in both the dense and the non-dense wood, grading by density cannot be used. Grading by measuring the sag of planks supported at a given distance is the method used. (Investment in a mechanical stress-grading machine is uneconomical for the small mills sawing coconut stems). Visual grading by assessing the number of fibrovascular bundles at the ends is another possibility. The sawn timber is very susceptible to decay: the softer specimens having a life of as low as four months, while the denser ones attain 2.5 years. Sawn timber must therefore be preserved, but this is not a problem. Drying also poses no problems: coconut stem wood's drying rates approach those of hardwoods classified as moderately easy to dry. The use of stellite or carbide tipped blades is essential. Finishing is important, especially for the household articles.

PROMOTIONAL WORK DONE

The Philippines is the country that has done most work in this respect. It has established testing and training facilities devoted exclusively to coconuts, and coconut stem wood. A large specialised bibliography has been compiled, the main groups of authors being researchers at their Forest Products and Coconut research facilities and the experts provided under projects financed by UNDP and executed by FAO and UNIDO. Work has also been done in Australia, Fiji, Indonesia, New Zealand and Papua New Guinea. Even the German bilateral aid agency GTZ has published a very useful manual. Grading rules have been published. Seminars to disseminate the technical information were held in Tonga in 1976, in the Philippines in 1979, in the Solomon Islands in 1982 and again in the

Philippines (Lucena City in February, Davao City in April 1985 and at the Product Development and Design Centre in Manila in July 1989). These seminars were all aimed at developing and promoting the use of coconut wood as a substitute for traditional wood species in the construction and building industries.

However, there remained major problems to overcome. One was the acceptance of coconut wood as a species for which a building loan could be obtained. It is difficult to classify the specie into one of the strength groups because the very wide variation in density of the sawnwood obtained from the same stem calls for very strict grading, and it is difficult to assess the strength of the sawnwood visually.

The other problem was that of finding uses for the relatively large volume of low-density sawnwood produced. Unless this wood is disposed of, even at a marginal cost, the sawing of large volumes of coconut stems and placing the sawnwood on the local market as a utility hardwood for structural purposes is likely to be uneconomical. For example, while relatively good charcoal can be obtained from the 'dense' wood, this is not the case with the 'soft' wood.

Development and promotion of the use of coconut wood on the desired 'industrial' scale requires that the problem of the widely dispersed coconut farm ownership be effectively addressed. More than 75% of the area under coconuts is owned and farmed by small-holders who are not capable, both financially and technically, of carrying out a replanting program that could ensure a reliable and continuous supply of coconut stems. This would be a prerequisite of securing the desired growth of the stem processing industry. The situation has also hindered the efforts of governments in the coconut producing countries to promote the use of coconut wood as a substitute for traditional wood species in the building and construction industries.

CONCLUSIONS

The ban on felling in the natural forests combined with an insistence on utilizing only wood from forests (and plantations) that are managed on a sustained yield basis, may help to promote the use of coconut wood in ITTO producing countries. The modification of building regulations and the training of graders would be prerequisites of the successful introduction of these measures. Any other problems that remain are specific to the small-holders, which prevent them from producing a reliable and continuous supply of coconut stems.