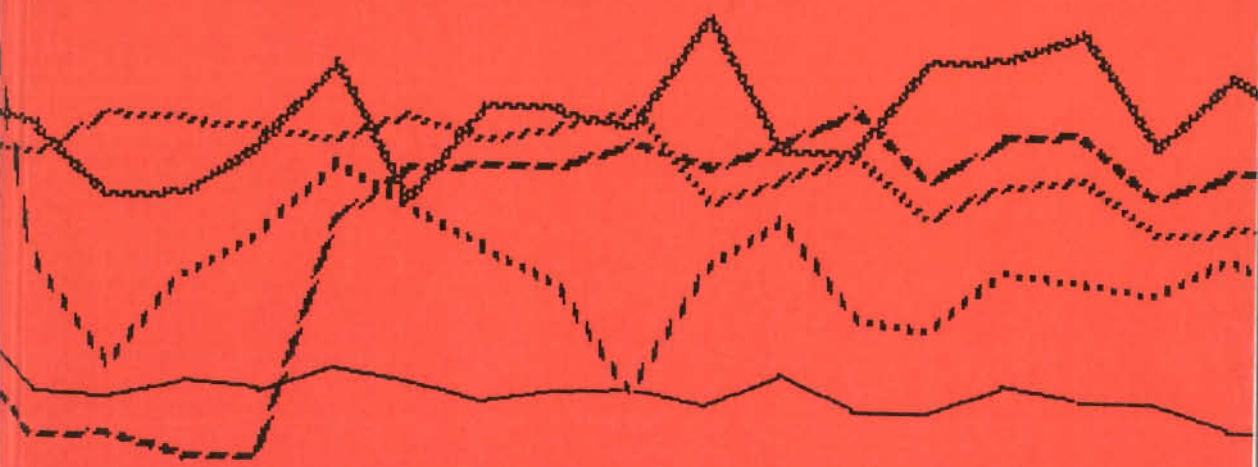
International Trade in Forest Products

edited by
András Nagy



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Foreword

This volume is the outcome of an international collaborative effort within the Forest Sector Project, carried out at the International Institute for Applied Systems Analysis (IIASA). The aim of the Forest Sector Project was to analyze current trends and future prospects of the worldwide forest sector from the standpoint of applied systems analysis.

Applied systems analysis focuses on long-term, complex policymaking problems of a global or universal character. To highlight scenarios and policy options at strategic and geographically diversified levels, modeling is often essential. But modeling is not enough. The applied nature of the project requires intensive empirical work, based on the best available statistical data bases as well as extensive discussions and interviews with decisionmakers and other experts operating in the international environment. This volume primarily reflects this applied emphasis of the Forest Sector Project.

During the statistical analysis presented in the volume, a substantial and successful collaboration with FAO, UNIDO, and UNCTAD developed. IIASA is very grateful for the assistance given by these UN organizations in preparing statistics for this analysis.

Part of the work was funded by the Swedish Council for Building Research, whose support is gratefully acknowledged.

The other part of the empirical study reported on in this volume is based on a large number of interviews and discussions with industrial and governmental decisionmakers in the countries participating in the Forest Sector Project. IIASA is grateful for the cooperation of these high-level respondents.

This book would, however, never have been successfully completed without the great personal contributions made by Dennis Dykstra, Gábor Kornai, Miyoko Yamada, Robert Duis, and the chapter authors.

We hope that *International Trade in Forest Products* will be a useful complement to the modeling and other quantitative sections of the project, published in a separate IIASA volume, *The Global Forest Sector: An Analytical Perspective* (M. Kallio, D.P. Dykstra, and C.S. Binkley, editors, Wiley, 1987) and in the TIMS volume, *Systems Analysis in Forestry and Forest Industries* (M. Kallio, Å.E. Andersson, R. Seppälä, and A. Morgan, editors, Volume 21 in TIMS Studies in Management Science Series, North-Holland, 1986).

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CHAPTER 1

Introduction

A. Nagy and Å. Andersson

In 1982 a Forest Sector Research Project was started at the International Institute for Applied Systems Analysis (IIASA) with the objective of studying long-term development alternatives for the forest sector on a global basis. The research program would include an aggregate analysis of long-term development of international trade in wood products as well as a detailed analysis of the forest sector in individual countries and regions. One central aim was to develop national forest sector models that could be linked to each other through a global trade model.

When the planning of the basic principles and assumptions started, some of the collaborating model builders thought that the global trade model could be based on the ideas of general equilibrium theory, representing the classical model of a competitive market (see, e.g., Salo and Kallio, 1982; Buongiorno and Gilless, 1983; Kirjasniemi *et al.*, 1983). Others criticized this approach, drawing attention to market imperfections, to inertia in trade flow adjustments, and even questioning some basic assumptions concerning the factors that shape the structure and dynamics of international trade, the role of prices and their determination, the role of trade policies, etc.

It was generally agreed that the information available for research purposes on the actual trading practices of forest products is very limited, and completely insufficient for building a realistic global trade model or for the evaluation of the validity of such a model. As a consequence it was decided that, in parallel with the development of national models with different approaches to their linkages, an effort should be made to collect papers on actual market behavior and on trading practices from as many important exporting and importing countries as possible.

After identifying potential authors, a list of questions was produced to orient them to the main issues, or to the issues we thought to be the major ones, asking them to give answers from the perspective and experience of their own countries. These questions related to the factors that shape trade

flows between countries, to the trade barriers against forest products, and to the competitive or oligopolistic character of the different markets.

Among the questions on factors that influence or determine trade flows, we asked how durable or rigid are traditional trading relations and how difficult is it to change trade partners. Further, we inquired about the role of prices, how close they are to marginal production costs, and how closely they follow cost changes and demand conditions of the import markets. Would they be differentiated on the same market and what price variations would there be on different markets? What is the role of plan targets, of compulsory contingencies on the trade of socialist countries, and how far is socialist trading influenced by profit motives and thus by prices?

We intended to obtain a comparative view of trade barriers in the different markets, both of tariffs and of nontariff barriers and on how far their effect is felt by exporters or importers. We inquired about the existence of cartels and about the content of agreements such as price setting, quantity allocation, market sharing, etc.

It is evident that these questions are difficult, and it is no surprise that we could not get answers to all of them from our contributors. However, the answers in the following chapters are complementary in the sense that each of them deals with some of the questions, and we find answers to all of the questions in the different chapters. Of course, the answers are very different and sometimes contradictory, not only because of differences in conditions and prevailing views in the different countries and of the range of authors, but also because the same market condition sometimes looks quite different to different participants in the trading system.

Our effort to recruit authors for our book was only partially successful. Looking at the Table of Contents it can be seen that most of the important regions are quite well represented, such as North America (the USA and Canada), the Nordic countries (Sweden and Finland), Eastern Europe (the USSR and Hungary) and Pacific developed countries (Australia and Japan), but others are not. Chapters on some major West European importing countries are obviously lacking and that on Brazil is not sufficient to deal with all the problems of the developing countries exporting wood products. However, even if our collection cannot be regarded as representative for all regions, it is for some important regions, and it is unique in its coverage and focus even so.

We can sum up the picture presented by the chapters on international trade practices and market conditions of forest products in one sentence: Market conditions are very differentiated. They are so differentiated by products and by different regions that it seems impossible to arrive at any generally valid conclusions or characteristics. This seems to be an important conclusion in itself. *No global trade model can be regarded as relevant and realistic unless it makes a special effort to include at least the most important specific market characteristics of the different commodities and of the different main regions.* Models using the same approach of how demand and supply determine prices, how costs are related to prices, or how markets are cleared, etc., may give nice results, but they will not be accepted by those who know how the actual market forces operate.

Reading the chapters one does not learn this either, and even less can one guess what single approach could encompass all these characteristics. However, one can certainly get an impression of the complexity of the problem, which may have an immunizing effect against simplistic "solutions".

Let us now consider a few features of the trading conditions that are difficult to deal with in a global trade model.

1.1. Inertia of Traditional Trading Links

The chapters present ample evidence for a significant level of dynamic inertia embodied in the pattern of the major trade flows of forest products. These observations are in line with the earlier findings of Anderstig (1982) and Batten *et al.* (1983). This is a natural consequence of widespread long-term trading agreements or of extensive capital investment in trade-oriented facilities between partners, of risk-avoiding behavior, and of the importance to maintain a continuity of supply and/or quality control even if formal agreements do not limit rapid and complete change of partners.

Long-term contracts are common in product categories such as pulp or newsprint, where both the continuity of shipment and quality are important (see Haley, Chapter 4), i.e., where uneven supply or quality can result in cost increases or loss of customers. According to Anderson and Ohlsson (Chapter 10) "The buyers of wood pulp are ... characterized by a considerable 'supplier loyalty'. Changing suppliers means increasing costs, for technical and other reasons ... and might involve the risk of losing the service to which the buyer is accustomed." Another reason for "supplier loyalty" is that some suppliers are considered as "safe", and they mention as an example that labor conflicts in Canada have contributed to the growth of pulp imports from Sweden.

Another example of the strength and slowly changing character of traditional trading links is observed by Francescon and Nagy (Chapter 13), comparing North American and West European import intensities of nonconiferous sawnwood from different developing regions. The high intensity of North American imports from Latin America and the much lower intensity of their imports from Africa or the ASEAN countries were compared with opposite import intensities of the West European countries. They conclude: "It seems to be obvious that in these highly divergent trade intensities, trade policy factors such as the remnants of colonial links play a significant and slowly changing role."

Trade-intensity analysis of forest products by the same authors showed in a surprisingly large number of cases a strong stability, i.e., little fluctuation either in the sense that they hardly changed or that a smooth change followed a definite time trend. Another aspect of the same phenomenon is the observation that trade flows are highly concentrated, i.e., in most products there are only a few major exporters and importers, and a handful of trade flows cover a large majority of the value of total trade. This, of course, is closely related to the bulky character of many wood products, where handling and transportation costs limit the radius of profitable trading. Consequently, concentration

is more true for logs than for paper products. However, even taking this into account, the concentrated character of trading patterns shows a very significant and little-changing role of trade preferences that are strongly binding for the partners (see Andersson and Persson, 1982).

Part of this characteristic of trade relationships can be well treated by the inertia approach (see Johansson and Persson, 1982; Batten and Johansson, 1985) to trade modeling, reflecting the sequential effect of the establishment and maintenance of certain rigidities in the trade adjustment process. This is the case when link-related factors, such as distance, trade policy preferences, and barriers to trade, provide resistance against changes that are generally attributed to supply- and demand-related factors and to price competition alone.

On the other hand, the quite general trend of trade liberalization is mentioned in most of the chapters in one form or another (and termed by Francescon and Nagy as "normalization of trade intensities"). This trend is the result of the breakdown or weakening of colonial links or other preferential ties, with a concomitant opening up of trade links where political and other artificial barriers hindered trade. Thus, we find many examples where market forces are gradually changing traditional patterns. This is not, however, always the case:

> In the cases where trade policy or purely political considerations have an obvious influence on trade relationships, the assumption that this influence diminishes over time cannot be generalized. It seems doubtful that in such cases the inertia approach can be applied, because it is based on the assumption that the role of nonprice, noncompetitive factors decreases over time. In a certain number of cases, this is true.... But in other cases, the opposite has been observed, either by formation of new or stronger integrations (and consequently disintegrations) or by sudden trade policy changes. [Francescon and Nagy, Chapter 13 of this volume]

1.2. Investments in Market Structures

There are also rational economic reasons for the slow change in international trade relations. The most prominent is the investment character of trading arrangements. In a sense, any system of production units (plants), distribution units (warehouses, sales offices, etc.), or marketing units and fixed transportation equipment together constitutes a temporally rather fixed logistical *network* with correspondingly fixed costs of operation. The variable representation of transportation costs is therefore in general economically invalid. The logistical problem should rather be represented as a *network depreciation and investment problem*, where any change in trading structure must be represented as a time-consuming process of market network investments and disinvestment in sales organizations, warehouses, etc.

Recent statistics on Swedish industry reveal that such investments are very substantial also in the forest industry. *Table 1.1* shows that market

Table 1.1. Structure of investments in Swedish industry by subdivision into material investments, R&D investments, and market investments in 1980, given as percentage share of value added (SIND, 1982).

	Investment in			
Industry	*Material capital*	*R&D*	*Markets*	*Total*
Mechanical wood processing	12	1	7	20
Pulp and paper	19	2	4	25
All industry	14	6	7	27

investments (which include costs of new sales channels, market information, warehouses, sales offices, inventory expansions, advertising, and lobbying) take a very large share of total investments, especially in the wood industry. Some of these investments are as durable as most material capital (e.g., machines). They should have a correspondingly great impact on the process of spatial reorganization as machine and other equipment investments have on industrial restructuring processes. Any economist knows that substantial changes in the relative role of any one industry in a national economy will take decades, even if price structures change substantially. In the same way and for similar reasons, a change in trade structure should be expected to take decades, even if there are significant changes in comparative cost advantages.

1.3. How Perfect is Competition?

Practically all the chapters in this book deal with the problems of how far competition in the different product categories is free or what the symptoms and causes of imperfections are. The picture varies by products and by authors, but a few general observations can perhaps be made.

There seems to be general agreement that the North American softwood lumber market is perfectly competitive (see Flora, Chapter 11; and Haley, Chapter 4). The product is homogenous, information on prices and market conditions is transmitted quickly and is well known by both sellers and buyers, and there are so many firms engaged in production and trade that none of them is large enough to influence prices. Nevertheless (or because of this?) the pressure for protection against (mainly Canadian) imports has recently increased through proposals that tariffs and quotas be introduced.

On the West European lumber market, competition also seems to be quite free (see Anderson and Ohlsson, Chapter 10), even if there are only three major exporters: Finland, Sweden, and the USSR. Theoretically these countries could assert an influence on the price levels of the more numerous importing countries. The fact that in Finland and in Sweden there are a great number of exporters competing with each other and negotiating for prices and other conditions with the buyers determines the competitive character of the soft sawnwood market in Western Europe.

The market for softwood logs is very different. Canadian exports are strictly controlled and even prohibited, as in significant areas of the USA (in the federal lands of the West). Exports are highly concentrated and the major firms are either closely linked to overseas trading companies, like joint ventures, or they are foreign owned, like Japanese trading companies owning American exporting subsidiaries. According to Nomura (Chapter 8) "about 60% of the North American timber trade volume to Japan is controlled by about ten major American forest owners/wood processors". This is considered by him as a sign of the oligopolistic nature of the log market. Flora, from the USA, is obviously not in agreement with this; and even if he shows that log export prices are at least 50% higher than domestic ones, he describes the American log market as also being perfectly competitive. Löfgren and Johansson (1985) have shown that the Swedish sawn timber market is approximately competitive. However, they have also shown that the Swedish market for pulpwood is of a *monopsonistic character, with disruptive consequences for the allocation of wood between pulping and mechanical processing.*

A major log exporter is the USSR, especially to Japan (78% of Soviet log exports are oriented to Japan; see Ozsvald, Chapter 5). This export activity is, of course, highly concentrated, although four trading enterprises participate in it from the USSR side. Soviet–Japanese trade is based on long-term agreements, with yearly negotiations about the volume of exports for the following year and with quarterly negotiations about the prices (Nomura, Chapter 8). Part of the timber imported by Japan is based on a kind of barter trade as they participate in the exploitation of Siberian forests with logging and transportation equipment in exchange for timber and pulp. We have no information on the pricing mechanism, but it certainly does not follow the rules of a perfectly competitive market.

Wood pulp production has become strongly concentrated in the last ten to fifteen years because only large-scale production and high-capacity utilization can be efficient (see Anderson and Ohlsson, Chapter 10). Flora mentions that in the United States the 20 largest pulp mills accounted for 99% of production in 1977. The structural change in the pulp industry has meant not only a decrease in the producing units and an increase of their capacities but also a tendency to integrate with paper producers. As a consequence the marketed share of the pulp produced is gradually shrinking and it becomes more and more a "surplus" product. Anderson and Ohlsson, Seppälä (Chapter 6), and Haley are in agreement that the majority of pulp is sold under long-term contracts and the large producers are price leaders, exerting a substantial influence on the pricing process. Haley quotes a number of experts, who "all concluded that the pulp market more closely resembles an oligopolistic than a purely competitive structure". This is not in contradiction with the fact that both the demand for and the prices of marketed "surplus" pulp in the spot market are very volatile, exhibiting cyclical behavior and vigorous competition, leading to price discounts, when demand is weak.

According to Haley:

> As in North America, European pulp markets have many of the characteristics of an oligopoly but with some price competition by means of discounts during periods of low demand. In December 1984, the EEC found 41 companies guilty ... of acting as a cartel in order to restrict price competition for pulp in European markets. Charges were based on the fact that pulp producers quote the same price on a quarterly basis in United States dollars.

There can be no surprise that major pulp exporters collude, as in Finland pulp producers have had their sales association since 1892 (see Seppälä, Chapter 6), and Swedish, Finnish, and Norwegian pulp producers are cooperating actively on the market and are exchanging information with North American and some European producers. The Swedish National Price and Cartel office registered 21 cartel agreements in the wood pulp and paper market in 1983 (Anderson and Ohlsson, Chapter 10). It is obviously much more difficult (if not impossible) to obtain information on cartel agreements on an international level, but, reading the chapters of this volume, there can be little doubt that the charges brought against major pulp producers in the EEC are not without foundation.

Paper production and marketing is naturally much less concentrated than pulp production and trade. Traditionally, paper mills have delivered small quantities to the buyers according to their needs. According to Anderson and Ohlsson, as papermaking machines became larger and more efficient a fast concentration and specialization of production was started, causing a process of standardization of the products that was more or less forced upon the buyers. This tendency was linked to an increased concentration in the printing industry and an integration among paper mills, wholesale dealers, and printing firms.

Newsprint is the major product in the paper industry. While a spot market for it exists in both North America and Western Europe, most sales are made under long-term contracts between producers and publishing companies. Prices seem to be less flexible than those for pulp and discounting is less frequent. Other paper and board products are less concentrated at both ends of production and sale; short-term contracts and a freer competition prevails.

Nevertheless, within the so-called "Scan" organizations, paper and board industries in Sweden, Finland, and Norway have developed a method of cooperation whose aim is mainly to protect the interests of the Nordic paper mills on export markets, as Anderson and Ohlsson tell us. In Australia "the major domestic [paper and board] producer within each product group possesses a high degree of monopoly power", say Ferguson and Batten (Chapter 2), and therefore dominates trade patterns. For many product lines, this producer is also a major importer, having a national marketing network.

However, as paper production is spreading, trade becoming more liberalized, and competition tougher, there is a growing dissatisfaction with sales associations and monopoly power not only from the buyers but even from the producers. Seppälä, for example, reports that some Finnish paper companies

resigned from sales associations and developed their own trade organizations especially for more refined products. Sales associations separate production from marketing and the producer from the buyer, which can be very harmful in investment and R&D decisions. The elimination of domestic competition is no more sufficient or advantageous when international competition is fast developing. (See the very instructive discussion of the advantages and disadvantages of sales associations in Chapter 6.)

The picture of the freedom of competition, or the lack of it, is, of course, much more varied in the chapters presented in this volume (and it certainly would be more varied if contributions on more countries could have been obtained). However, one thing is clear. Market conditions of most wood products are far from "the classical textbook model of competitive markets" in most parts of the world, as Flora characterizes (not very convincingly) the US market structure in general. Partly for natural reasons (e.g., distance), partly for historical and political reasons, there is not a single "world market" for most forest products but a fragmented one consisting of the different main regions, where freedom of competition and the power relationships of sellers and buyers can vary substantially. Even if one can quite frequently discover a tendency to liberalize trade relationships with the goal of enlarging competition, this is not always the result. Collusions, cartelization tendencies, or political barriers are not constantly diminishing, but are in certain cases stable or increasing. On the basis of such observations one cannot, of course, say *how* these characteristics of international trade can be treated in a global trade model of forest products, but it can certainly be stated that, without finding a solution for a satisfactory treatment of these features, no model or its results can be regarded as feasible or realistic.

1.4. What Prices?

The questions we asked above on price formation and on its role and behavior are unfortunately not sufficiently answered by our authors. This is probably partly due to the fact that it is not easy to obtain information on the pricing mechanism, the bargaining process, or the relationship of prices to costs. However, another reason could also be that experts regard these as so "natural" that they find all explanations superfluous, without taking into account how difficult it is to simulate the "natural" pricing mechanism in an international trade model.

There is an interesting description of Swedish export price behavior for coniferous sawlogs, sawnwood, pulp, and paper in the period of 1970–1984 by Anderson and Ohlsson, which gives a detailed picture of how supply, demand, inventory changes, and competition of other exporting countries were linked to price changes and how the major raw material (log and pulp) price movement is related to that of the processed product (sawnwood and paper). The case of pulp prices is instructive: in the recession following 1974, in spite of falling sales "prices remained fairly stable for most of the products.... The reduced level of capacity utilization raised production costs which, together with

increasing inventory costs, heavily forced down the profitability of the forestry industries". Finally prices had to decrease also, and the Swedish currency had to be devalued to make the industry profitable again.

Ferguson and Batten's account in Chapter 2 of Australian price formation, like Iusem *et al.*'s on the Brazilian practice (Chapter 3), shows an extensive use of administered pricing through trade associations or government agencies. In Australia price competition is increasing with changes in the resource base and in trade policy:

> Yet domestic prices are still generally sticky, responding only slowly to changes in demand. Substantial differences can arise between the offer prices for imports and those for domestic production, but the prevalence of administered pricing and price leadership masks these differences in terms of effective prices in the market. [Ferguson and Batten, Chapter 2]

One of the basic assumptions of many trade models, especially in those of general equilibrium or optimization framework, is that relative prices are the major determinants of trade flows and their changes (see, for more detail, Nagy, 1983b). In these models, within certain limitations goods are imported from the lowest-price suppliers, while prices are such as to clear markets. Trade flows (or shares) are assumed to be functions of the relative prices of the exporters, and the latter are thought to be closely related to domestic marginal costs.

Judging from the force of traditional trading links and the oligopolistic character of several wood products' markets, it seems evident that importers are rarely completely free to switch suddenly from one supplier to another. The little we have learned on price formation also tells us that "cost-plus pricing", i.e., export prices closely following cost changes, is more an exception than the rule on international markets.

In the case of perfect competition (coniferous sawnwood is perhaps closest to this case among our products) in the world market, i.e., if *there really is* an integrated world market, prices (less transportation costs) are the same. Consequently, there are no relative price differences to force changes of market shares. The large observed dispersion of prices in the trade of homogenous commodities indicates market imperfections. If we assume that changing comparative advantage is the driving force behind changing trade patterns, it would be more logical to suppose that it works through cost and profit margin differences rather than through price differences.

The idea that importers select the "best offers" among all suppliers implies that demand determines trade, i.e., that buyers are in the primary position as price setters. Research on factors determining trade flows, however, has revealed what those familiar with trading practices always have known, namely, that marketing efforts (or "push") of exporters are at least as important in explaining trade flows as the demand (or the "pull") of importers (see Linnemann, 1966; Nagy, 1979). If marketing of supply plays an important role in the determination of trade flows and especially if exporters are in a stronger position ("price leaders"), we may just as well assume that suppliers

choose their markets according to the "best offer" made to them. In this case trade would be driven not by the lowest but the highest price bids.

In reality, both tendencies are present in a bargaining game prior to each transaction: importers are looking for low-price suppliers and exporters for high-price markets, and both are trying to adjust their purchases and sales accordingly. Price formation and price differences in practice reveal a great variety of outcomes, which seem to depend on the market conditions of the given commodity at a given moment and on the relative bargaining power of the partners participating in the bargaining process. Extreme solutions with unique prices, like those of a perfect monopoly or of perfect competition, are rare exceptions. The more common case is that prices are differentiated both for exporters selling in different markets and for importers buying from different sources.

1.5. The Dynamics of Competition

The celebrated IIASA model of world trade is a dynamic equilibrium model, based on standard assumptions. In the core of the dynamic system of equations are investment and demand equations, which are the essential driving forces of the whole model. Demand is expanding by exogenous factors such as income per capita and population, while investment behavior is determined by a crude vintage model with investments entering "optimally" and replacing outdated units of production. Natural resource constraints are determined by slowly changing supply of different types of wood. Any fully fledged dynamic comparative advantage analysis is, of course, ruled out by the fact that the model does not take sectors of production other than forest products into account.

The basic weaknesses of the approach are the following:

(1) Market structures are either assumed perfectly competitive or of the idealized planning type.
(2) Marketing, transportation, or distribution of commodities does not require any fixed capital investments.
(3) Technology is exogenously determined and is not part of the business negotiations and strategic decisions.
(4) All competition is strictly neoclassical and thus reflects prices only.

The first two issues have been dealt with extensively in an earlier part of this introduction. Points (3) and (4) will now be examined within a framework of dynamic comparative advantage analysis.

Two different paradigms can be used to understand the development of world trade, international locational patterns, and specialization of economies. These theories are:

(1) The theory of comparative advantages; and
(2) The theory of product cycles.

The first theory – which is closely related to general equilibrium theory – claims that each country tends to specialize in those commodities in which it has a comparative advantage in terms of costs of supply or productivity of resources. This means that it is not the absolute but rather the relative degree of superiority that determines in which commodities a country or a region should specialize. This implies that a country, such as Italy, that is superior to, say, Egypt in almost all lines of production should somehow limit its economic activity to a small set of commodities where its productivity is especially high in relation to that of Egypt and exchange these commodities for those in which Egypt is relatively highly productive.

In a special version of this theory, called "the factor proportions theory" (Ohlin, 1933), each country should specialize in those commodities requiring such factors of production that are relatively abundant in the country. Again it is a question of the relative or comparative rather than absolute position of the country.

It became fairly clear in the 1960s and 1970s that the use of a comparative advantage approach to an understanding of the development of international markets is crucially dependent upon a proper delimitation of the factors of production to be considered. The classical subdivision of factors of production into capital, labor, and land has not turned out to be sufficient in this respect. Empirical studies of the importance of these factors of production in the determination of specialization of countries have been rather discomforting (Leontief, 1953). The concepts of capital must be widened to include educational and other characteristics of the labor force and the requirements of these properties in the production of different commodities in order to understand the international division of labor. This essentially means that knowledge and its expansion through education and "on-the-job training" becomes a crucial factor in determining future international patterns of location and international market development.

A special aspect of this view of international markets is the consequence of changing knowledge and its simultaneous consequences for the demand for commodities. The asymmetrical expansion of the stock of knowledge as embodied in brains, computer software, and material capital in different regions of the world automatically implies a high degree of uncertainty about the future structure of world markets. The future international pattern of knowledge is uncertain, even unknown, and, in principle, unknowable, at least in long time perspectives.

In the medium term some of the consequences for international patterns of location can, however, be discussed at a qualitative level. The theory of product cycles and international patterns of location is designed to provide an understanding of these issues. The product cycle theory essentially claims that each product undergoes a development cycle in which each new commodity enters the most highly developed regions of the world after a phase of research, development, and laboratory testing. The commodity is then primarily produced in the region of comparative advantage in terms of product R&D with exports to all other regions. When the product has matured, the region of original introduction and specialization loses its comparative

advantage in terms of product and process development and its production becomes decentralized.

Table 1.2 illustrates the product cycle development of 23 different manufacturing products in the 1970s. The products requiring skills or a *systems orientation* tend to be especially protected in the OECD area. A high capital–labor ratio does not seem to prevent an industry from being equally well-adapted to production in underdeveloped countries. An example is the iron and steel industry, which recently has been relocated from OECD to newly industrialized countries (NIC). From the point of view of the forest sector, the position of wood products and market pulp in the product cycle is, of course, problematical. With the natural tendencies to decentralize these processes to countries outside OECD, there is a very urgent requirement to develop subproducts of these sectors with *high contents of skills and design* (i.e., increased value added), if a location of these activities within the OECD is to be retained in the future.

Table 1.2. Locational pattern and locational changes in the world economy, 1971–1977. Arrows indicate movements after 1977.

Tendency	*Increase or little change in OECD specialization*	*Fast decrease in OECD specialization*
Strong specialization to OECD area > 86% of imports covered by OECD exports	(1) Transportation equipment (2) Paper products (3) Machine industry (4) Printing (5) Beverages (6) Clay, stone, etc. (7) Chemicals (8) Pulp ⟶ (High skill/high capital, high transportation costs, systems-oriented products and processes)	(1) Rubber products (2) Plastic products (3) Metal products (4) Iron and steel (5) Instruments, clocks, and optical products (Low skill/high capital products and processes)
Low specialization to OECD area ≤ 86%	(1) Shipbuilding (2) Noncompetitive food (3) Wood products ⟶ (4) Other manufacturing products (5) Nonferrous metals (6) Competitive food (Protected industries)	(1) Electrical products (2) Textiles (3) Clothing (4) Petroleum products (5) Mining (Low skill/low capital, natural resources-oriented products and processes)

1.6. The Special Case of Trade of the Centrally Planned Economies

A special problem arises if a trade model is intended to be really global, i.e., to include the trade – both intraregional and interregional – of the USSR and the Eastern European countries. There are, of course, significant differences in the trade regulations and practices of these countries. Hungary, with its decentralized and market-oriented economy, is, for instance, an exception in many respects. Nevertheless, practically all forest industrial production and trade is managed by a number of hierarchically structured state-owned enterprises, creating trading practices so different from market behavior that it needs special treatment in such global trade models.

The basic difference is that variables triggering behavioral responses of the economic units in production and trade are not the same as those in market economies: the profit motive is either nonexistent or has a very subordinated role, and prices do not reflect scarcities or have no allocational function. As is well described in Ozsvald's Chapter 5, the economy is operated by compulsory planning targets, which

> are decided by central authorities, but these decisions reflect compromises as they result from bargaining between the respective Ministries and the lower levels of management.... Foreign trade is centrally controlled by administrative methods rather than by financial regulators. The producers are isolated from the world markets ... exports are channeled through foreign trade enterprises that are specialized according to product types and have monopolies in foreign trade transactions.

As a result of a long period of an inward-looking, autarkic industrialization policy, later complemented by a campaign for self-sufficiency on the CMEA (Council of Mutual Economic Assistance) level, quite different trading methods have developed among the socialist countries and in their trade with market economies.

What is common in the Soviet export policy of forest products is an effort to change the structure of their offer, to increase exports of the more processed goods (such as panel, pulp, and paper products), and stabilize or decrease exports of primary goods. According to Volkov (Chapter 12, *Table 12.9*), Soviet exports of coniferous logs decreased by 6% and sawnwood by 9% between 1970 and 1983, while pulp exports rose by 126% and paper by 41% in the same period, all in volume terms.

Trade intensities in forest products among the CMEA countries is high, as can be seen in Chapter 13 (*Table 13.5*), even if not as high as in other product categories (Economic Commission for Europe, 1971; Nagy, 1979). As the USSR is the main supplier of all forest products of the other CMEA countries, a radial pattern of trade has developed among them. Trade agreements are based on the coordination of national five-year plans, and their essential features are bilateralism and an effort to balance exports and imports in a

disaggregated way. Negotiations are conducted in volume terms (or in constant prices), and the deliveries agreed upon are obligatory for the partners.

The actual prices are negotiated annually and are based on a five-year moving average of the world market prices. These prices are separated in most countries from the domestic ones determined by the central authorities, and they are not influenced by scarcities on the CMEA market as prices are assumed to have only an accounting function.

Even from such a brief description, it seems clear that the assumptions of a general equilibrium framework are not valid for modeling trade flows among the CMEA countries. Demand and supply naturally play a decisive role in the plan's coordination process and in subsequent trade negotiations; but relative prices have no allocational function, and they move independently of the specific demand and supply conditions of the regional market.

The export of forest products was and still is among the most important convertible currency earners of the USSR. Major markets are the EEC countries, Finland, and Japan. The chapters dealing with this do not give much information on the behavior of the exporting firms active on Western markets, but this does not seem to differ much from their market economy counterparts. Specific features are probably a strong preference for long-term bilateral agreements and for counter-purchase deals, when the exports of forest products cover the imports of machinery, transport equipment, and consumer goods (Chapters 5 and 8). These preferences are closely related to the planning methods, having a five-year time horizon and prepared in quantitative terms. In other words, there is a preference for stability in trading which should not be disturbed by short-term demand and price fluctuations.

As far as the pricing methods are concerned, according to Ozsvald, the Soviet enterprises are "price followers" even on those markets where their market power is great. They do not seem to participate in the collusion of the large American, Canadian, and Scandinavian firms, but probably follow their pricing and trading policy closely.

The other Eastern European countries, especially Czechoslovakia and Poland, export mainly raw and semi-processed forest products to Western Europe. Because of the difficulties in balance of trade in convertible currencies strong incentives to export and restriction on imports were introduced, and efforts at self-sufficiency were made. Tariffs and quotas impede their exports to the EEC. Partly because of trade barriers and partly because of poorer and uneven quality, their export prices are reported to be lower than those of their competitors. As their market power is relatively weak, they are "price takers" in most cases, which means that their selling prices are not related to their costs or to the relative cost changes.

Eastern European countries import mainly processed wood products (pulp, newsprint, and other paper products) from the West. Because of severe restrictions, these usually do not compete on the domestic market with production but fill the gap between domestic supply plus CMEA imports and demand. As a consequence one cannot assume that their import demand is

sensitive to prices. It is probably more related to their balance of payments position in convertible currencies.

1.7. Conclusions

The chapters of this volume take a critical attitude to the formulation of trade models based on idealized assumptions and excessive abstractions from reality. Any large-scale (but necessarily simplified) quantitative computer modeling effort should be based on a careful study of the empirical regularities of the markets to be included. The critical, empirical studies presented in this volume indicate that the world market(s) for forest products are *differentiated* by product categories, regions, and economic systems. The differentiation manifests itself in the form of differences in market behavior, including price setting and cartelization, and in institutional trade regulations through quotas, tariffs, etc. These market imperfections are reasons enough for major deficiencies in the predictive power of any global trade models based on the sole assumption of perfect competition.

Dynamics introduces a second problem of modeling world trade patterns with any model based on the same general equilibrium assumption. If dynamics is introduced *ad hoc* in order to derive long-term trajectories, the procedures easily degenerate into a branch of economics that Ragnar Frisch once called "Playometrics". In order to avoid this, it is absolutely necessary to include in the analysis optimally simplified submodels of *technological change, logistical network formation, restructuring and dynamics of market structure, institutional change, and decision-maker expectations.* If this cannot be done properly the effects of such factors must at least be represented by mathematical relations that can simulate the here-documented empirically observed inertia caused by these dynamic phenomena.

We may conclude with a final word about the relocation of the forest industries between different world regions. Such relocation from the advanced market economies to other economies cannot be modeled within any strict *forest sector* model. The forest industries are competing for resources and network capacities with most other industries. In this dynamic competitive process, relative R&D activities as well as needs for and availability of education, capital, and other evolutionary factors are of the greatest importance.

Besides having these variables properly included in the dynamic model of the sector, there is an ultimate need to have all those industries (which are competing with the forest sector for resources) represented in some aggregate but relevant fashion. This is rarely done in global trade models of the sectoral variety. Rather these partial computer models prefer to strive for a strange degree of quantitative precision, forgetting the Samuelsonian rule, "It is better to be vaguely right than exactly wrong".

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CHAPTER 2

Australia: Recent Trends in the International Forest Products Trade

I.S. Ferguson and D.F. Batten

2.1. Introduction

Historically, international trade in forest products in Australia has been influenced greatly by two features. One is the nature and location of the forest resource, the other is the system of tariff and nontariff measures relating to trade.

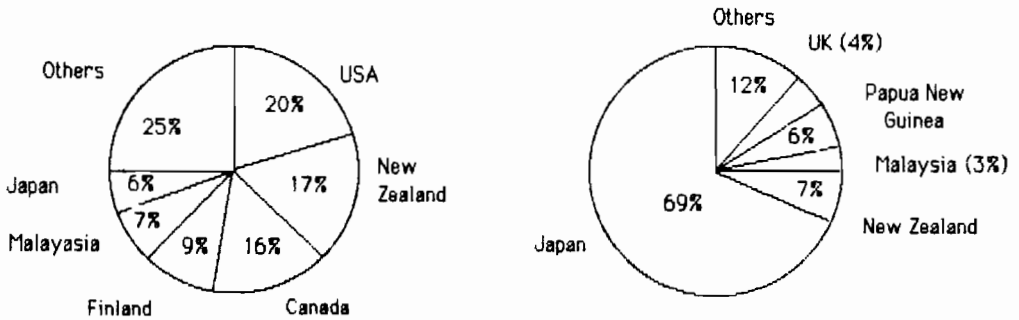
Australia's production and potentially productive indigenous forests are located within a narrow coastal strip, generally no more than 300 km wide, which runs around the southeastern, eastern, and northern coasts and the southwestern corner, and includes almost all of the island of Tasmania. These forests cover an area of about 41 million hectares or about 5% of Australia's total land area. The genus *Eucalyptus* predominates in most of these forests, providing a variety of hardwoods whose properties are almost as diverse as the 580 or so different species of the genus. Approximately 80% of these indigenous forests are controlled by state governments. Of this publicly owned forest, some 60% is available for wood production, the remainder being reserved for national parks. Plantation forests have been established at a number of locations and at an increased rate since the 1960s. By 1983 there were about 570 000 ha of state and 250 000 ha of private plantation. Exotic pines and conifers make up 95% of the plantation area.

The broad elements of recent trade in forest products are summarized in *Table 2.1*, with the geographical dispersion illustrated in *Figure 2.1*. Although this information provides only aggregate indications of Australia's present role in global trade, the following observations may be made:

(1) The export of woodchips to Japan accounts for almost two thirds of Australia's export income from forest products trade.

Table 2.1. Major elements in Australian trade in forest products, 1977–1979 (Byron, 1980).

	Export commodities			*Import commodities*		
	Wood chips	*Paper and paperboard*	*Sawn timber*	*Paper and paperboard*	*Sawn timber*	*Pulp*
Value (millions $ A)	82.4	17.2	6.1	231.7	146.6	57.4
Percentage of total forest products trade	65.7	13.7	4.8	44.6	28.2	11.0
Principal trading partners	Japan	South-east Asia	Western Europe, New Zealand	New Zealand, Finland, Canada	USA, Malaysia, New Zealand	New Zealand, Canada, USA
Domestic production (%)	52.6	3.3	0.9	38.8	37.7	29.7
Domestic consumption (%)	75.5	2.5	0.7	28.7	27.4	23.1



(*a*) Imports (*b*) Exports

Figure 2.1. Forest products trade in Australia, 1977–1978 (Byron, 1980).

(2) North America and New Zealand are the principal suppliers of most of Australia's imported forest products.
(3) The total value of imports is currently about four times that of exports, although this situation may change in the near future.

The tariff system in Australia traditionally used tariff and nontariff barriers to protect manufacturing industry against international competition. Since the 1960s, however, attention has turned to "the promotion of an economic climate conducive to efficient, internationally competitive production in Australia, mainly through the gradual reduction of assistance provided by import barriers" (Senate Standing Committee on Trade and Commerce, 1981).

Thus, an industry that evolved around native forests and high levels of protection now faces internal competition from firms based on plantation forests and external competition from international sources as import barriers are progressively relaxed. In addition, a previously fixed pattern of exchange rates has given way to floating rates, thereby increasing the uncertainties attached to international trade, whether imports or exports.

2.2. Sawn Timber

Australian imports and exports of logs for the manufacture of sawn timber are erratic and small in volume. Little change seems likely in the future.

Apart from imports of rough sawn timber which are resawn in Australia, most of the raw material supply for the sawmilling industry is obtained from Australian forests. However, imports of sawn timber have an important bearing on market behavior and price determination in the markets for sawn timber. Exports of sawn timber, on the other hand, constituted less than 1% of the volume consumed in the period 1978-1983. Exports have been declining in importance as overseas markets for railway sleepers, the largest export component, have retracted (see *Table 2.2*).

Table 2.2. Australian production, imports, and exports of sawnwood, 1982–1983 (Bureau of Agricultural Economics, 1984).

Species group and product	*Production* (10^3 m^3)	*Imports* (10^3 m^3)	*Exports* (10^3 m^3)
Broad-leaved sawn timber	1581	195	32
Coniferous sawn timber	1061	630	2
Railway sleepers	198	0	11
Total	2740	825	45

2.2.1. Imports of sawn timber

Australia imported about 25% of the annual volume consumed (about 4 million m^3) in the period 1978–1983 (Bureau of Agriculture Economics, 1984). This proportion has remained remarkably stable over a much longer period, despite fluctuations in annual consumption.

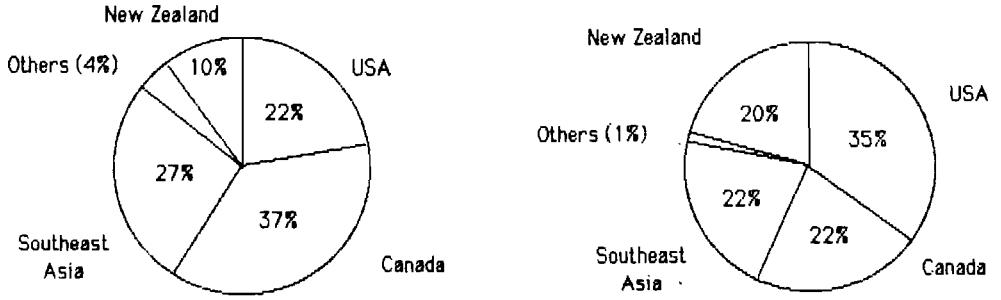
About 10% of the annual volume consumed has been imported in the form of rough sawn timber of large (mostly over 450 cm^3) cross-section (Industries Assistance Commission, 1981). These so-called "flitches" are resawn to final sizes at special sawmills located near the port of entry. Most of this material was Douglas fir and hemlock from North America.

Imports of flitches for resawing have a long history in Australia. Flitches attract a tariff of only 2% *ad valorem*. Furthermore, many of these imports entered under a by-law enabling manufacture (i.e., resawing) under bond

(Ferguson and Lloyd, 1980), thus reducing the duty payable to that on out-turn alone. Since 1982 the by-law provision enabling manufacture under bond has been dropped.

Sydney, Melbourne, and Adelaide have been the principal ports of entry for these flitches and hence the principal centers of consumption. In Melbourne and Adelaide, most resawing has been for specialty timbers such as structural beams or exposed feature surfaces. In Sydney, however, resawing has also supplied a significant proportion of light framing timber (termed "scantling") for house construction. While it is not possible to distinguish between this material and imports of the same species in smaller sizes, it seems likely that the resawing of flitches supplied the majority of the 30% of the Sydney market for scantling filled by North American species (Working Party on Douglas Fir, 1972). The importance of these species also testifies to their long-established and preferred use by many architects and builders in house construction in Sydney.

Imports of timber other than flitches fall into three groups, based respectively on North American, New Zealand, and Southeast Asian origin (see *Figure 2.2*).



(*a*) 1972–1973: 1.09 million m^3 (*b*) 1982–1983: 0.825 million m^3

Figure 2.2. Australian imports of sawn timber by relative volume and source.

Imports from North America of smaller sizes of Douglas fir, hemlock, western red cedar, redwood, and spruce–pine–fir probably average about 200 000 m^3 per year. Imports of rough sawn timber from North America attract a tariff of 5%. Importers of flitches and other North American timbers also constitute the principal network for wholesale distribution in Sydney, Melbourne, and Adelaide. In each case, a strong trade association represents the interests of these importers and timber merchants. In Sydney, the local trade association also provides port handling and delivery services through a subsidiary company. All three associations carry out periodic surveys of costs and set recommended maximum prices for the particular city based on the average cost plus a fixed manufacturing margin. Adherence to these recommended prices seems close, although some discounting occurs during difficult trading conditions.

Imports from New Zealand of Douglas fir and radiata pine have increased slowly over the past two decades and are now of the order of 180000 m^3 per year. In some cases the importers are those referred to earlier but independent and, in some cases, New Zealand-owned importers and merchants are also involved. These imports are duty-free. They tend to compete directly with domestic hardwood and with domestic and imported softwood in the scantling markets, especially in Sydney.

Imports from Southeast Asia of meranti, Philippine mahogany, kapur, and ramin have remained relatively stable at about 300000 m^3 per year over the last decade. Imports of rough sawn timber from these sources are duty-free. They are mainly used for specialty purposes and generally require further processing. They are not used for scantling.

Official statistics do not enable segregation of the volumes of dressed timber and mouldings from these earlier categories of rough sawn timber. Across all species the annual volume of imports is of the order of 120000 m^3. However, there has been a significant change in the origin of these imports, with the New Zealand share increasing markedly at the expense of Southeast Asian timbers (Industries Assistance Commission, 1981). Tariffs on dressed timber and mouldings are higher, being 15%.

2.2.2. Domestic hardwood production

Although the domestic hardwood sawmilling industry operates largely within a state framework, because of state control of forest resources similarities exist in market structures in the four eastern states (see Senate Standing Committee on Trade and Commerce, 1981). Each of these states has a large number of sawmills, most of them being very small in terms of sawn output. Each has a strong trade association, independent of the relevant state timber merchant/importers association. Each such association prepares recommended maximum prices for sawn timber, negotiates with the state government over stumpage prices, engages in promotion of timber, and deals with trade union, safety, and insurance matters on behalf of its members.

In each of these states a few firms control a number of sawmills, mostly of a larger scale. These firms are vertically integrated through ownership of seasoning and machining facilities, and of merchandizing centers. On the other hand, the majority of small sawmills sell green rough sawn timber either direct to builders, through agents, or to wholesale merchants.

Despite a structure which would seem to favor the development of a freely competitive market, the rigidities imposed by state control of the forest resource, and by a history of price control in World War II, have resulted in administered pricing (Means, 1972). Typically, each trade association conducts a quarterly cost survey and calculates price levels on an average cost-plus fixed-profit margin basis. Discounting occurs during difficult conditions, and for large contracts, but many sawmills adhere closely to these prices.

In Western Australia, the only other state or territory with a significant hardwood sawmilling industry, one firm controls an overwhelming majority of the production. It is highly integrated both vertically with further processing and marketing facilities and horizontally with the supply of pulpwood for export woodchips. Historically, similar pricing practices have applied to those in the eastern states, but the degree of monopoly power of the largest producer is now such that it exercises a dominant influence through direct price leadership.

The average annual production of the Australian hardwood timber, including railway sleepers, was about 2.1 million m^3 for the period 1978–1983. The production level has declined slowly over the last two decades due to the withdrawal of public land from wood production, the exhaustion of some sources of supply on private land, and a hiatus in supply due to a transition from old growth to regrowth in public hardwood forests. However, the rigidities of supply and pricing for this sector must be stressed. In many cases, sawmills must take a high proportion of all of their state quota of sawlogs each year or risk penalties. There is little scope, other than the limited private supply, to increase the amount of timber cut beyond that provided in the quota. The administered pricing system for hardwood timber is slow to respond to change especially to downward shifts in demand. Thus a substantial amount of the short-term response to changes in demand has to be taken up by changes in product quality and sawn recovery.

Exports of hardwood timber have averaged about 60 000 m^3 per year over the period 1978–1983, some 40% being railway sleepers produced in Western Australia. The bulk of exports of timber other than railway sleepers have been to Europe, principally from Tasmania. Interstate exports of hardwood timber from Tasmania to Victoria average around 160 000 m^3 per year. Smaller quantities are traded in both directions between Queensland and New South Wales.

2.2.3. Domestic softwood production

The softwood sawmilling industry in Australia produced an average of 1.1 million m^3 of sawn timber from 1978–1983. About 15% of the volume was derived from the cypress pine forests of inland New South Wales and Queensland and about 5% from various other native conifers in Queensland and Tasmania.

Plantation-grown conifers supplied 80% of this volume, principally radiata pine in the temperate zone and Southern pines in the subtropics and tropics. Because of an accelerated program of plantation establishment since 1965, plantation conifers will probably constitute 50% of the annual volume cut by 1990 with further increases to follow (Senate Standing Committee on Trade and Commerce, 1981).

The scale of development and concentration of plantations has enabled the plantation-based industry to develop on a larger and better-integrated

scale than is generally true of the hardwood industry. Six of the 25 sawmills in South Australia, currently the largest center of production, have log intakes in excess of 60000 m^3 per year. Seasoning, machining, waste utilization, and marketing activities are closely integrated in sawmills of this size. Furthermore, the dominance of radiata pine across several states has led to the implementation of uniform grading and marketing practices. Thus, virtually all radiata pine timber is stress-graded for structural use, including scantling. All radiata pine timber, other than rough carcasing or box timber, is sold dried and dressed. Similar practices are being adopted for Southern pine timber in Queensland.

The progressive expansion of the plantation-based industry has necessitated a more aggressive approach to marketing and pricing in order to penetrate traditional hardwood framing markets and to compete with imported softwoods.

2.2.4. Price determination

Although the Australian sawmilling industry has traditionally been characterized by a lack of vigorous competition in the determination of prices, emerging trends all point to greater competition in future. Many of the restrictive practices associated with price maintenance through trade associations have been eliminated under the Trade Practices Act. The increasing volume of plantation-grown softwood will open further opportunities for the construction of new, large, and well-integrated sawmills. These will seek to penetrate the traditional hardwood and imported timber markets.

Current tariff structures have largely eliminated the cost advantages enjoyed by importers of flitches from North America and these merchants are therefore likely to turn increasingly to imports of softwood in smaller sizes and to local softwoods. Some impediments to overseas competition still exist, such as the quarantine requirements (Ferguson and Lloyd, 1980) designed to keep major insect pests and diseases out of Australia. However, competition from New Zealand producers, who enjoy duty-free access to Australian markets, is bound to increase. North American producers and importers are also likely to maintain competitive pressures now that the tariffs involved are smaller.

Thus, the future status of the hardwood industry is probably most open to doubt. Nevertheless, this industry enjoys cost advantages with respect to location relative to many rural centers of population. Restructuring of the industry in the face of future competition will also help to overcome some of the inherent disadvantages of scale that it now suffers. In the longer term much depends on whether Australian consumers recognize some of the special features of appearance, strength, and durability of indigenous timbers, which they have hitherto taken for granted. This may lead to much larger price differentials for these properties and timbers than is the case at present.

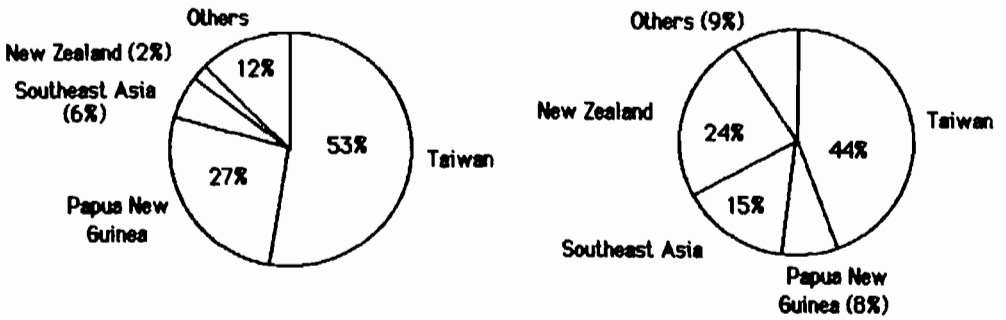
2.3. Panel Products

Average annual levels of production, imports, and exports for the various panel products are shown in *Table 2.3* for the period 1978–1983. Significant changes have occurred in the relative market shares held by these products over this period, and in the geographical sources of imported plywood and veneer (see *Figures 2.3 and 2.4*).

Table 2.3. Average annual volumes (1000 m^3) of production, imports, and exports of panel products in 1978–1983 (Bureau of Agricultural Economics, 1984).

Product	*Production*	*Imports*	*Exports*
Plywood	84	68	1
Particleboard	585	1	10
Hardboard	96	1	5
Softboard	14	1	–
Medium-density fiberboard	–	1[a]	–

[a] 3000 m^3 in 1982–1983.

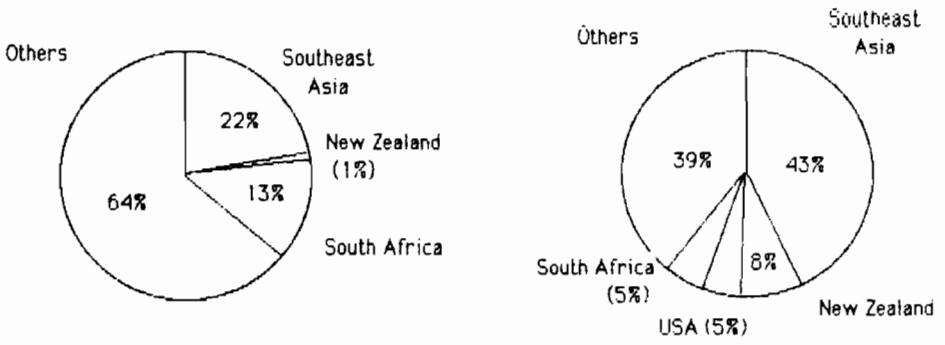


(*a*) 1972–1973: 52.965 m^3 (*b*) 1982–1983: 53.819 m^3

Figure 2.3. Australian imports of plywood by relative volume and source.

2.3.1. Plywood

Plywood's share of the total wood-based panel market fell from 27% by volume in 1971–1972 to 19% in 1978–1979 (Parsons *et al.*, 1982). Although imports of plywood fluctuated widely over this period, there is no evidence of a secular increase. Hence, the change in market shares can largely be attributed to competition from particleboard, which increased its share from 47% to 63% over the same period.



(*a*) 1972–1973: 15.462 m^3 (*b*) 1982–1983: 17.035 m^3

Figure 2.4. Australian imports of veneer by relative volume and source.

However, there has been a substantial change in the nature of the plywood produced in Australia over the last two decades. Some 90% of domestically produced plywood is now in thick (over 5.5 mm) grades, compared with 15% previously. In particular, thin interior plywood from Asia has largely supplanted domestically produced thin plywood (see *Figure 2.3*). Parsons *et al.* (1983) attributed this to Asian advantages in shipping costs for thin plywood, being a higher value per unit volume product, and to the greater suitability of Asian hardwoods for the manufacture of thin plywood.

Up to 1981 tariff quotas prevailed for imported plywood other than that from New Zealand, which mostly entered duty-free. A special tariff quota was set for Papua New Guinea, giving duty-free entry for thin plywood up to a quota of 7135 m^3 per year, beyond which level imports attracted a tariff of 30%. All other plywood from Papua New Guinea carried a tariff of 30%. With few exceptions, imports of plywood from other countries carried a tariff of 40%, with thick plywood attracting a tariff quota beyond 10000 m^3 per year in the form of an additional surcharge based on thickness.

In 1982 the Commonwealth Government reduced tariffs markedly, following receipt of the report of the Industries Assistance Commission (1981). By 1985, progressive reduction brought the general tariff down to 25%, the tariff quotas having been abolished. Papua New Guinea has duty-free entry up to 30000 m^3 per year, a tariff of 15% applying beyond that figure.

The effects of these changes are not fully reflected in the data in *Table 2.3*. Nevertheless, subsequent changes seem likely to be small, the major structural adjustments having taken place already. According to the Forest Products Industries Advisory Council (1981), the number of plywood mills dropped from 55 to 33 in the period 1970–1979, while employment halved. The shift toward the development of modern plywood plants based on plantation-grown conifers over the last decade should ensure continued viability of most of the industry. These plants enjoy substantial economies of scale and are better located relative to the major centers of consumption.

Comparative surveys of Australian and overseas prices of plywood by Parsons *et al.* (1982) suggested that the secular trends were similar for thick plywood, although overseas prices were more volatile. The relative stability of Australian prices is probably another example of the use of administered pricing through the industry trade association.

Parsons *et al.* (1982) note that the future level of supply from Asian countries is open to debate. However, in the longer term, competition from these sources is likely to continue as processing in the developing countries increases. Furthermore, competition from New Zealand and Papua New Guinea plywoods, and from other panel products, will maintain competitive pressures on the Australian industry.

2.3.2. Veneer and veneer logs

Imports of veneer averaged about 18000 m^3 per year over the period 1978–1983. It is not possible to distinguish between veneer imported for plywood manufacture and that used for facing particleboard. Imports from New Zealand, Papua New Guinea, and other developing countries are admitted duty-free, while most other imports carry a tariff of 15%. As can be seen in *Figure 2.4*, there has been some shift in the market shares in favor of coniferous veneers from New Zealand and of rotary-cut hardwood veneers from the Philippines. Little major change is expected in this market in future.

Imports of veneer logs have changed markedly over the last decade in concert with the restructuring of the plywood industry. The proportion of imported logs used in plywood manufacture has fallen from 50% in 1972 to less than 15% in 1978. This change also reflects restrictions placed on log exports by some Southeast Asian countries. No tariffs are applied to these imports. Little change is expected in this market.

2.3.3. Particleboard

Particleboard is manufactured by eight companies in 19 mills in Australia, using forest and sawmill wastes from plantation-grown conifers. Imports have been negligible over the last five years, principally because of chronic overcapacity in Australian industry. From 1974 to 1980, the average realized price of particleboard increased by 11% compared with a rise of 90% in the Building Materials Index of prices (Industries Assistance Commission, 1981). Nevertheless, tariffs on imports have been high, being 30% in general and 15% on New Zealand imports until 1981, and thereafter reducing to 20% and 5%, respectively, by 1985.

Exports were negligible until 1979, but have averaged about 10000 m^3 since then. Again, this is probably a temporary reflection of the severe overcapacity in the industry. Neither the freight rates nor the low value-to-volume ratio would appear to favor continuation of this trend once the local market recovers.

Pricing can be characterized as administered pricing, although severely tempered by the overcapacity and competition with other products in recent years. Since 1982 some imports of medium-density fiberboard from New Zealand have commenced, and a plant is under construction in New South Wales. These changes will maintain competitive pressure on the particleboard industry.

2.3.4. Hardboard and softboard

During the last two decades hardboard and softboard production in Australia has declined progressively, with the older plants closing in the face of competition from particleboard. Exports of hardboard have similarly declined, and international trade is now negligible, despite tariffs of 20% (previously 30%). Only one manufacturer remains, operating two hardboard mills and one softboard mill. The Senate Standing Committee on Trade and Commerce (1981) considered that the market for hardboard, in particular, was likely to continue to decline in the face of improved technology and consumer preferences for alternative panel products.

2.4. Pulpwood and Woodchips

Some 5 million m^3 of pulpwood were produced from forest sources and sawmill residues in Australia in 1983 for the purpose of pulp and paper manufacture. Of this volume, 4 million m^3 was exported to Japan in the form of woodchips, worth about $150 million per year FOB (Phillips, 1983). The current operations are summarized in *Table 2.4*.

The export licenses shown in *Table 2.4* refer to controls exercised by the Australian Government under the Customs Regulations. An export license is granted on the approval of the Australian Minister for Primary Industry (Cromer *et al.*, 1975). Approval requires that the contract price negotiated by the local company is equivalent to or above the ruling world price, after taking into consideration the quality of the chips and other relevant factors such as transport costs. Contracts must also contain adequate provision for price escalation over time. Since 1974 new licenses have also been subject to an environmental impact assessment under the Environmental Protection Act. In some cases further federal controls with respect to reafforestation or a feasibility study of pulp mill construction have been imposed where state legislation did not make provision for such controls.

In addition to federal controls most of the woodchip operations draw their wood from publicly owned forests and are thus subject to controls exercised by the state governments, which have the responsibility for managing these resources. Apart from setting up the conditions of sale of pulpwood to the companies, and for associated forest management activities, the most significant feature of these controls is the pressure they attempt to place on the later construction of pulp mills, subject to feasibility studies being favorable.

Table 2.4. Australian woodchip operations, 1984 (Phillips, 1983).

State, company and port	*Operations commenced*	*Export license*	
		Amount (10^3 green t/yr)[a]	*Expiry date*
New South Wales			
Harris Daishowa (Aust.) Pty Ltd.:			
Eden	1970	850	1989
Sawmiller Exports Pty Ltd.:			
Newcastle	1981	3550	1996
Tasmania			
Associated Pulp and Paper Mills Div. of North Broken Hill Holdings Ltd.:			
Tamar	1972	850–920	1985
Triabunna	1971	800	1986
Forest Resources Div. of H.C. Sleigh Resources Ltd.:			
Long Reach	1972	770	1987
Western Australia			
W.A. Chip and Pulp Co. Ltd.:			
Bunbury	1976	900	1991

[a] One green ton is approximately 1.1 m^3.

To date, none of the several studies carried out have seemed sufficiently favorable to encourage a commitment to construction of a pulp mill in the near future, although opinions and assessments have certainly varied (see, for example, Byron, 1979; Department of Industry and Commerce, 1979).

The complexity of the controls relating to pulpwood supply, and of state and federal controls relating to woodchip prices and the construction of pulp mills, leads to an oligopolistic market structure involving only a few large sellers and buyers. The buyers and agents for current operations are summarized in *Table 2.5*.

Details of price determination are confidential, but the market structure is clearly one in which bilateral bargaining would occur between sellers and buyers. Sellers no doubt bargain with reference to cost and other state and federal pressures; and buyers with reference to the state of the pulp and paper market, the costs of pulpwood from other sources of supply, and quality issues.

Byron and Douglas (1981) conducted a comparative analysis of the CIF price received for Australian woodchips relative to those from other sources (*Table 2.6*). They concluded that prices paid for Australian woodchips delivered in Japan were significantly less than for chips from other sources. However, these analyses did not take into account major quality differences between the various woodchip operations (see Phillips, 1983). These quality differences and the difficulties of comparing prices negotiated under

Table 2.5. Australian woodchip companies and their buyers and agents (Phillips, 1983; Higgins and Phillips, 1973).

Woodchip company	*Buyer (s)*	*Agent*
New South Wales		
Harris Daishowa (Aust.) Pty. Ltd. (wholly owned by Daishowa Paper and C. Itoh)	Daishowa Paper Mfg. Co. Ltd.: Suzakawa Mill	C. Itoh and Co. Ltd.
Sawmillers Exports Pty. Ltd.	Oji Paper Co. Ltd. Chuetsu Pulp Co. Ltd.	C. Itoh and Co. Ltd.
Tasmania		
Associated Pulp and Paper Mills Ltd.:		
Tamar	Sanyo-Kokusaku Pulp Co. Ltd.: Iwakuni Mill	Sumitomo Corp.
	Mitsubishi Paper Mills Ltd.: Hachinoke Mill	Mitsubishi Corp.
Triabunna	Jujo Paper Co. Ltd.: Isinomaki Mill	–
Forest Resources Div. of H.C. Sleigh Resources Ltd.	Taio Paper Mfg. Co. Ltd.: Iyomishima Mill	Kawatetsu Bussan Co. Ltd.
Western Australia		
W.A. Pulp and Chip Co. Ltd.	Hokuets Paper Mills Ltd. Nagoya Pulp Co. Ltd. Sanyo-Kokusaku Pulp Co. Ltd.	Marubeni Corp.

Table 2.6. Woodchip prices (yen/t) per ton (CIF Japan), 1973–1980 (Byron and Douglas, 1981).

Item	*1973*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*
Coniferous:							
USSR	10228	14230	14565	14070	12221	14565	28300
USA	11434	23134	21470	19894	16492	17102	31250
New Zealand	14283	23057	22099	20409	17761	18489	28555
Nonconiferous:							
Malaysia	9720	19911	22356	22248	20454	21669	23119
USA	13902	22886	20739	20159	17650	20081	28350
New Zealand	13786	22256	22011	22535	16653	18206	24344
Australia	13850	19673	20612	19286	16875	17412	22051

long-term agreements in Australia with the short-term contract and spot prices typical of the North American softwood exports make comparisons between Australian and North American prices very difficult. Comparisons between prices for Australian woodchips and those for hardwoods from other countries are vitiated by differences in properties and uses and by the

dominance (65%) of Australia's sales to Japan relative to other sources of imported hardwood chips.

2.5. Pulp and Paper

Statistics for the production, import, and export of pulp and paper products in 1982–1983 are summarized in *Table 2.7*. The two principal features that influence the pattern of trade shown in this table are market structures and tariff and nontariff distortions.

Table 2.7. Australian production, imports, and exports of pulp and paper products, 1982–1983 (Bureau of Agricultural Economics, 1984).

Product	*Production* (10^3 t)	*Imports* (10^3 t)	*Exports* (10^3 t)
Mechanical pulp	240	3	–
Chemical pulp	475	207	–
Waste paper	590	–	n.a.[a]
Newsprint	376	135	10
Printing and writing paper	179	185	12
Other paper	438	174	44
Paperboard	420	60	6

[a] n.a. – not available.

2.5.1. Market Structures

Each of the major groups of paper products is dominated by one or two domestic producers, as *Table 2.8* shows. Imports of pulp were chiefly of chemical softwood pulp. Over half of these imports currently come from New Zealand under a special tariff concession, which will be discussed later (see *Figure 2.5*).

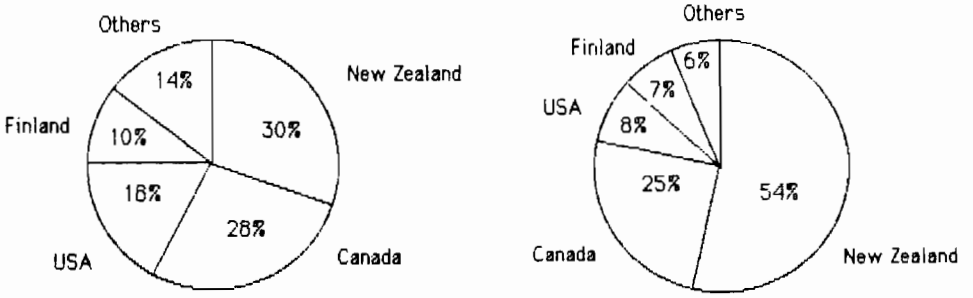
Imports of newsprint almost halved compared with 1981–1982 with the increase in domestic production from a new mill. Newsprint imports were drawn principally from Canada (35%), Finland (35%), and New Zealand (21%). Nearly half the imports of printing and writing papers came from Finland, and the remainder were spread evenly across eight or more countries. The USA supplied over half of the imports of other paper and of paperboard. New Zealand was the next most important supplier of other paper (14%), but the remainder was spread widely in terms of the source. Japan was the only other supplier of paperboard of any significance (18%).

Most exports were to other countries in Oceania or Southeast Asia, with packaging paper and paperboard predominating.

The major domestic producer within each product group possesses a high degree of monopoly power and therefore dominates trade patterns. For many product lines, this producer is also a major importer, having a national marketing network.

Table 2.8. Production capacity of Australian pulp and paper companies, 1984 (Bureau of Agricultural Economics, 1977; Department of Industry and Commerce, 1979; and personal estimates).

Product and Company	*Location of pulp mills*	*Approximate capacity* (t/yr)	
		Pulp	*Paper/board*
Newsprint			
Australian Newsprint	Boyer, Tas.	200 000	200 000
Mills Ltd.	Albury, NSW	180 000	180 000
Printing and writing papers			
Associated Pulp and Paper	Burnie, Tas.	69 000	230 000
Mills Ltd.	Wesley Vale, Tas.	36 000	various plants
Packaging papers and paperboard			
Australian Paper	Maryvale, Vic.	300 000	750 000
Manufacturers Ltd.	Millicent, SA	30 000	various
	Petrie, Qld.	12 000	plants
Smorgon Consolidated Industries Ltd.	Footscray, Vic.	200 000	200 000
Tissues and special thin paper			
Bowater Scott Ltd.	Myrtleford, Vic.	40 000	40 000
Kimberley Clark Ltd.	Millicent, SA	80 000	80 000



(*a*) 1972–1973: 307 000 t (*b*) 1982–1983: 209 000 t

Figure 2.5. Australian imports of pulp by relative volume and source.

2.5.2. Tariff and nontariff distortions

Trade agreements between Australia and New Zealand have been negotiated to provide for mutually beneficial expansion of trade between the two countries. The most recent agreement, entitled "Australia–New Zealand Closer Economic Relations" (Department of Trade, 1983), extends the earlier arrangements

under the New Zealand–Australia Free Trade Agreement to encompass a wider array of products, although most of the substantive changes affecting trade in forest products had been made earlier.

Tariff legislation in Australia includes provision for imports entering under by-laws. These by-laws provide a legal means of reducing the duty payable, provided certain conditions are met. Under the most recent Australia–New Zealand Trade Agreement, Australian importers take 75% of their pulp imports from New Zealand, or pay a duty of 15% on imports from other sources. Although this is clearly a trade-expanding device in relation to Australia and New Zealand, it does discriminate against other countries. As a consequence (Ferguson and Lloyd, 1980), further distortions arise because pulp exporters elsewhere tend to regard Australia as a captive market for New Zealand pulp and are therefore reluctant to channel supplies into Australia in times of scarcity. The most recent agreement therefore includes a clause that encourages New Zealand producers to accord Australian importers priority in terms of continuity of supply in times of shortage. Reciprocal provisions exist for the export of hardwood pulp from Australia to New Zealand, but no such sales have been made.

New Zealand exports of most forest products currently enjoy substantial export subsidies in the form of a tax credit of up to 11.9% of the net foreign exchange earnings (Ferguson and Lloyd, 1980). Under the recent Australia–New Zealand Trade Agreement, these subsidies for exports to Australia are to be phased out by 1987.

Similarly, remaining tariffs on most other goods traded between the two countries are to be phased out by 1988, and any tariff quotas or import restrictions will be removed by 1995. These changes are unlikely to have much impact on trade in forest products between the two countries, most of the major changes having been in force for some time. Nevertheless, certain preferences to be accorded to New Zealand newsprint may have some impact on Australian imports from other countries. Newsprint is otherwise imported into Australia free of duty or other restrictions.

Most other paper and paperboard products receive some degree of tariff protection. Rates average somewhat less than 20% *ad valorem* under the general tariff for packaging and printing papers, and less than 8% for tissues. Reduced preferential rates apply for Canada, generally being 5% less than the general rate, and still larger deductions for developing countries.

The printing and writing paper sector received short-term assistance by production subsidies and advance orders from the Federal Government during an especially critical period in the mid-1970s. These no longer apply, and the only other forms of assistance enjoyed by the industry are those enjoyed by all manufacturing industries, such as export incentive grants and freight subsidies.

Export incentive grants are made to all manufacturing industries. These are based on a regressive schedule of grants for progressive incremental gains in exports beyond the base level at the start of the operation of the scheme. In general, these grants do not seem to have been sufficiently attractive to have had any major impact on exports of forest products. Freight subsidies

are paid to manufacturing industries located in Tasmania to encourage exports to the mainland. These subsidies are based on a formula that attempts to equalize the effective freight cost from Tasmania to the mainland with that in the reverse direction. These subsidies have an important influence on interstate trade and also place Tasmanian producers in a more favorable position to compete on the mainland with international imports.

2.5.3. Price determination

The price of imported pulp has been and is an important determinant of domestic prices (Bureau of Agricultural Economics, 1977). The preferential treatment accorded to New Zealand pulp may result in short-term pressures on Australian pulp prices in times of scarcity but, in the longer term, trends in world prices control the secular trend in New Zealand and hence in Australian prices. The domestic industry seems to be reasonably efficient even though the scale of production seems less than optimal in some sectors.

Newsprint prices in Australia are deliberately geared to import prices. The sole domestic producer is a wholly owned subsidiary of all but one of the major newspaper publishing firms and therefore enjoys a captive market. In 1976 this domestic producer introduced a deliberate policy of basing the price of domestic newsprint on standard world prices. The remaining major publishing firm purchases on long-term contract from the cheapest national or international source.

Prices for other paper products are distorted to some degree by the tariff protection accorded to many of these products. Nevertheless, prices for packaging papers and paperboards are also determined by competition between the two domestic producers and by the prices of substitutes. Thus, the role of tariff protection is muted by other influences for these products. Prices for writing and printing paper are said (Bureau of Agricultural Economics, 1977) to be determined by import prices in most cases, although "local costs and profitability considerations have played a part on occasions". This suggests that tariff protection has a more significant role for these products. Prices for tissue papers are only protected by a low tariff and are therefore largely subject to control by import prices.

2.6. Conclusions

The preceding reviews of market behavior and price determination for different groups of forest products illustrate the variety of factors that determine international trade in Australia. Price competition is becoming much more important with the changing resource base and tariff system. Yet domestic prices are still generally sticky, responding only slowly to changes in demand. Substantial differences can arise between the offer prices for imports and those for domestic production, but the prevalence of administered pricing and price leadership masks these differences in terms of effective prices in the market.

There is ample evidence to suggest that a considerable degree of inertia is embodied in the trade pattern of Australian forest products, similar to that observed in other nations (Batten *et al.*, 1983). Long-term agreements between international trading partners are widespread. The export woodchip industry is largely based on very long (ten-year) agreements with Japanese buyers. Most importers dealing with North American and European partners likewise rely heavily on long-established linkages with particular partners because the delay between placement of spot orders and delivery can be up to six months when world demand is high. Regular trading partners minimize such delays and maintain a continuity of supply and shipment.

Export promotion by Australian governments, trade associations, or firms has not been prominent. However, some interest in export promotion was aroused during the recent recession. One major paper producer has formed a joint marketing subsidiary with its New Zealand counterpart to handle export promotion and sales in Southeast Asia. Some trade associations and firms have undertaken trade missions to potential importing countries, although on a very modest scale.

By the turn of the century there is likely to be an excess of wood available over domestic consumption (allowing for some continuing imports) due to extensive plantation establishment in the 1960s. Because of the magnitude and timing of the restructuring of the Australian industry, which is underway, it is not yet possible to discern whether Australia will be able to capitalize on the possibilities that exist (Ferguson, 1981) for future exports. In particular, it is not yet clear whether or when the woodchip industry will be able to proceed to pulp manufacture, much of which will have to be exported.

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CHAPTER 3

Brazil: The Forest Sector's Participation in International Trade

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3.1. Overview of the Brazilian Forest Sector

The Brazilian forest sector can be divided into natural and man-made forests. Vast forest lands still remain – constituting 41% of Brazil's land area – principally in the northern region, where the largest tropical rainforest in the world is located.

Although population growth and the concomitant needs for fuelwood have historically been the most important factors in the devastation of the forest cover in the south and southeast of Brazil, the clearing of land for coffee planting was also responsible for a significant portion of forest removals. In certain regions, as in the state of Minas Gerais, forest removals for coffee plantations are considered more important, in terms of devastation, than wood removals for charcoal production for use in the iron and steel industry (Beattie, 1975).

Man-made forests were already under way before the Brazilian government launched its fiscal incentive law in 1966, which offered tax incentives to individuals and corporations. However, this law greatly accelerated the establishment of forest plantations. At present, the area reforested in Brazil is approximately 5.5 million ha.

Brazil is a major producer and consumer of almost all of the principal processed forest products, except pulp and paper (mainly newsprint paper), which it imports. It has a sizeable export surplus of lumber and meets the needs for veneer and plywood from domestic production. According to *Table 3.1*, in 1983 Brazil exported a total of 2.3 million tons of forest products; and between 1977 and 1981 its exports of forest products grew at a rate of about 31%, while in the same period its imports decreased at a rate of 3.3% (*Table 3.2*).

Table 3.1. Brazilian forest sector exports, 1977–1983 (Anciaes *et al.*, 1979; Santos *et al.*, 1982–1985).

Product	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*
Quantity (1000 tons)							
Roundwood	[a]	[a]	[a]	[a]	[a]	7.815	10.485
Charcoal	14.334	23.862	31.408	25.837	9.435	2.860	6.741
Coniferous sawnwood	61.425	66.924	78.704	75.070	50.153	36.909	33.926
Nonconiferous sawnwood	193.422	107.914	57.666	135.563	94.205	94.710	109.499
Prefinished wood	72.334	223.017	351.526	337.850	342.265	239.776	275.857
Plywood	33.408	51.797	71.776	64.030	73.305	52.810	95.514
Veneer	36.968	35.185	27.047	29.890	31.935	35.193	40.502
Fiberboard	127.322	164.706	153.999	173.505	197.990	181.583	185.879
Particleboard	1.253	.747	2.127	1.446	5.495	.417	1.510
Pulp	94.630	267.931	582.540	885.776	944.643	814.494	986.648
Paper	42.249	103.602	141.354	190.648	329.353	270.240	440.605
Others[b]	66.150	64.235	76.558	73.428	87.288	98.176	121.632
Total	743.495	1109.920	1574.705	1993.043	2165.867	1835.019	2308.798
Value (US $1000 FOB)							
Roundwood	[a]	[a]	[a]	[a]	[a]	1383	1421
Charcoal	570	808	2000	1582	1010	282	984
Coniferous sawnwood	17984	23307	39136	45683	29732	19838	17112
Nonconiferous sawnwood	37199	21955	14106	3887	31418	27687	37510
Prefinished wood	23651	58978	104083	126864	146898	119457	137247
Plywood	15116	24359	38282	41282	48071	32342	48410
Veneer	24645	24683	28556	34354	32062	29360	30732
Fiberboard	27921	34908	38628	48717	57779	42972	43482
Particleboard	450	273	556	603	1724	165	467
Pulp	19487	57484	181308	362703	363179	275291	311100
Paper	22270	53345	92477	155543	219915	174196	208434
Others[b]	86781	85911	109323	169425	111750	123763	140933
Total	276074	386011	648455	985634	1043538	846736	977832

[a] Included in "others".
[b] Includes mainly Brazilian chestnut, mate (*Ilex paraguayensis*), canned palm hearts, and furniture.

3.2. Forest Plantations and Reforestation

It is estimated that by the end of the century natural forest outside the tropical rainforest will be exhausted for commercial exploitation, i.e., all commercial wood, except a fraction earmarked for nonconiferous sawnwood and veneer, will originate in man-made forests. Public policy, through fiscal incentives and other subsidies, will therefore be a crucial factor in the

Table 3.2. Brazilian forest sector imports, 1980–1983 (Banco do Brazil, 1970–1984; Santos *et al.*, 1982–1985).

Product	*1980*	*1981*	*1982*	*1983*
Quantity (1000 tons)				
Roundwood	41.384	28.197	24.842	25.262
Nonconiferous sawnwood	315.683	227.832	231.197	167.449
Veneer	65.230	62.936	57.526	40.213
Pulp	60.595	32.563	16.086	12.916
Paper	271.392	242.048	224.937	26.545
Others	9.085	7.553	21.585	11.811
Total	763.369	601.129	576.173	484.196
Value (1000 US $ FOB)				
Roundwood	6198	5522	3505	6556
Nonconiferous sawnwood	26763	16323	10964	7073
Veneer	13593	12264	10237	6835
Pulp	34582	20180	9023	6867
Paper	211514	156494	143417	121495
Others	1537	3381	12787	5182
Total	294187	214164	187933	154008

determination of the growth rate of the sector as a whole, and *a fortiori* in Brazil's ability to become a major exporter of forest products.

Of Brazil's 5.2 million ha of forest plantations, 90% are located in the southern and southeastern regions, which have been largely denuded of their natural forests. Forest planting was stimulated both by the fiscal incentive act (see *Table 3.3*) and the spectacular yields obtained from some of the early plantings. Yields of up to 70 m^3 per ha per year have been obtained from *Eucalyptus* plantings ready for pulpwood harvest in seven to eight years, and those obtained in pine plantings are about 35 m^3 under management on good sites.

Most of the yield is earmarked for the pulp and paper and the steel industries, which increased their output at a rate of 10% per annum during the 1970s. In certain regions some plantation yield is destined for charcoal production. Only a small portion of plantation management is aimed at sawlog and veneer log production.

According to analysis of the plantation program and the projections for 1990, domestic consumption indicates the immediate need for an accelerating plantation program. Plantations will be needed to yield annually by 1990 about 80 million m^3 of industrial roundwood. The need is particularly acute for softwood sawlogs, currently being obtained from the disappearing natural *Araucaria* forest, and for charcoal, now coming from badly degraded and shrinking natural woodlands.

The plantation program must also resolve conflicts of interests. Integrated pulp and paper firms are understandably concerned only with pulpwood rotations, since their main object is to provide raw material for their pulp and paper mills, not to maximize returns from plantation management.

Table 3.3. Area (ha) approved by IBDF for reforestation using fiscal incentives (Instituto Brasileiro de Desenvovimento Florestal, direct information).

Year	*Pinus Sp.*	*Eucalyptus Sp.*	*Others*	*Total*
1967	18 159	13 877	2 724	34 760
1968	60 899	30 057	11 945	102 901
1969	96 798	53 800	11 785	162 383
1970	111 913	83 609	18 483	222 005
1971	98 052	129 053	21 365	248 470
1972	101 059	172 441	30 856	304 356
1973	86 181	161 132	46 481	294 154
1974	83 245	188 336	52 798	324 379
1975	94 221	222 718	81 301	398 240
1976	87 001	262 337	99 911	449 249
1977	99 277	194 352	52 803	346 342
1978	140 725	228 068	42 911	411 704
1979	117 944	282 419	73 355	473 718
1980	88 650	271 550	76 375	436 575
1981	117 160	229 675	71 040	417 875
1982	158 335	186 820	85 830	430 985
1983	73 565	91 035	50 400	215 000
1984	70 750	123 560	89 590	283 900
Total	1 711 934	2 924 839	919 313	5 556 086

Similarly, steel mills sponsoring plantations are concerned only with short rotations that maximize the output of the charcoal wood. Other plantation managers, however, face other options, since their goal should be to maximize financial returns. With this aim, the most profitable operations might well be a series of thinnings to provide intermediate crops of pulpwood or charcoal wood and a final crop of longer-rotation wood grown for sawlogs. Public policy must show more concern with this dilemma. Integrated product management is still scarce, handicapped by the lack of a body of research applicable to Brazil's condition that will indicate the most profitable combinations of soils, climates, species, tree-spacing and thinning regimens, rotation ages, and timber-product mixes. Furthermore, if Brazil's policy is to provide a margin for the export of lumber, pulp and other forest products, additional plantation establishment is needed.

The reforestation activity possesses the capacity to become a powerful engine for social change and development in the Brazilian rural sector. To date, however, this unique opportunity for social intervention has been largely ignored by policymakers and researchers. It is important to assert that this neglect is not due to simple oversight. Rather, the fiscal incentives for reforestation – as well as other programs or projects in Brazil – reflect the immediate interest of institutional structures of power and influence that do not want to lose their *status quo*. For example, the following statement was made about the Brazilian National Alcohol Program: "Of prime importance is the channeling of resources into the formation of large-scale rural

enterprises. This occurs in practice, even though it is omitted from the program's stated intentions". This assertion made for the fiscal incentives program for alcohol remains valid when applied to the same program for reforestation.

3.3. International Trade

When analyzing the current situation of Brazilian foreign trade in forest products, one of the first observations to be made refers to the wide difference among markets corresponding to the various products of the sector. This is due not only to the differences among the products themselves in production, marketing, consumer targets, etc., but mainly to the highly uneven development pattern of Brazilian industry (or of its economic structure as a whole).

This pattern is characterized by the coexistence of (1) modern industrial complexes using advanced technologies, which enable them to compete on an equal footing with producers from the developed countries (DCs); and (2) a very large number of small to medium-size enterprises that lag decades behind such complexes in technology, management, personnel training, financial capabilities, etc., and that present all the typical features of backwardness usually associated with the less-developed countries (LDCs).

This uneven development pattern for the Brazilian industry as a whole is shown in equally uneven situations in either geographical or sectoral disaggregations. This is especially true for the forest sector, where products and producing regions behave quite differently, according to the degree of development of the industry in each of them.

This "dual" aspect of the Brazilian economy is shared by several of the so-called Newly Industrialized Countries (NICs), but Brazil has distinctive features within this group, some of which relate specifically to foreign trade.

While in most of NICs industry developed mainly as an export-oriented activity, this was not the case in Brazil, at least until a few years ago. This was due to several reasons, the most important of which was the existence of a large (both in absolute and relative terms when compared with other LDCs) domestic market for industrialized products. The rapid growth of the Brazilian economy during the 1970s (with GDP growth rates averaging 7–8% per annum) was accompanied by a corresponding growth in this market. Though foreign trade increased accordingly during that period and manufactured products and services increased their share of total exports, they were not the leading force for industrial growth in general.

This situation changed drastically at the beginning of the current decade, when, as a result of the impact of the worldwide recession on Brazil and the inability of the country to sustain an ever-increasing foreign debt approaching $100 billion, it became imperative to turn the historical trend of only marginal surpluses or deficits in the foreign trade balance (which clearly became deficits after the second oil shock) into a definite surplus trend.

This goal was attained in 1984, with a surplus in the trade balance of $13 billion (with a value of exports twice as much as that of imports), when exports became the main concern of many industrial sectors previously oriented toward domestic markets. In fact exports were the main factor preventing the Brazilian recession from becoming deeper than it was, and allowed the economy to present a positive GDP growth rate in 1984.

Of course, such a result in the foreign trade balance was made possible in part by the recession itself. The contraction of the domestic markets due to the high loss of purchasing power by the middle class allowed industry to increase exports without capacity expansion, as at that time capital was acutely scarce. Such a contraction of home demand also reduced drastically the demand for imports. However, there was also a dramatic change in the traditionally secondary role of exports for several industrial sectors. This was also true for the forest sector, which involved changes in marketing strategies, an intensive search for new trade partners, increased demands for quality control, standardization of products, etc.

These changes confronted the different segments of the forest sector with numerous constraints that acted as obstacles to the expansion of exports. Some of these were due to the uneven development mentioned earlier, and influenced segments at the lower level of development, while others affected all industrial sectors equally. Among the latter we mention first the relatively high freight rates encountered by Brazilian exporters. For example, forest sector products exported from Brazil to the United Kingdom have a freight rate twice as high as the route from Malaysia to the United Kingdom. Such a difference is related not only to the differences in volumes transported but also to historical deficiencies in the Brazilian port infrastructure, which is not prepared to handle the increased amount of goods quickly and efficiently. Though this infrastructure has been significantly improved in recent years, with the opening of new ports and the modernization of others (including extended "containerization", roll-on/roll-off facilities, etc.), the average situation of Brazilian ports places a heavy burden on exporters and contributes to high freight rates. In this area, as in others, the recession that provoked expansion of exports at the same time acted as a brake: the strict financial limitations resulting from the foreign debt situation will severely affect the development of large new infrastructure projects, at least in the next few years, beyond the completion (possibly with delays) of those that are already under way.

A similar bottleneck exists in transportation from factories to ports, aggravated by the large extent and the geographical features of Brazilian territory. Though road construction has suffered less from recession than other infrastructural areas, and several new roads have been or are being completed, many potentially exportable products become noncompetitive due to lack of adequate transportation facilities. This is the case, for instance, of nonconiferous sawnwood from the north of the country.

3.4. Price Formation and Government Export Policy

3.4.1. Nonconiferous sawnwood

The production of nonconiferous sawnwood is the less-developed segment of the forest sector. Most nonconiferous sawnwood suitable for export comes from natural forests, mainly in the north. The majority of sawmills are relatively small and many of them operate in a highly hostile environment (Amazonia and nearby regions), facing severe constraints regarding transportation (both for inputs and outputs), qualified manpower, etc., as is usually the case in tropical forests. Two species, "Mogno" (*Swietoneia macrophylla*) and "virola" (*Virola* spp.), are the main products with the marginal participation of a few others. In general, producers of the timber sector lack the "know-how" and marketing resources to attain a successful penetration in new markets and also have serious difficulties in attaining the quality standards required for exporting. There is an association of exporters, comprising the majority of them, whose activity, however, has been quite limited up to now.

In order to prevent importers from taking advantage of this situation, the Carteira de Comércio Exterior do Banco do Brasil (CACEX), a government agency that regulates the Brazilian foreign trade, sets up, in periodic meetings with producers and exporters, reference prices obtained from consultations with foreign buyers and from their own data bank. Of course, due to the reduced volumes involved, Brazil has little or no influence in the price-formation process, and CACEX activities are more of a "clearinghouse" nature, making current price information available to domestic agents. These reference prices also act, however, as a kind of price floor. Transactions at prices lower than these are likely not to be authorized by CACEX, which has the authority to ban them.

Within the limitations already mentioned, some producers in the area are making serious efforts to extend their participation in foreign markets, in many cases with the collaboration of local and state authorities. They include the use of outsiders instead of cartelized freight carriers between Belem and the USA, for instance, and an attempt to market new species abroad. In the latter case, the main obstacles lie in convincing buyers of the quality of species previously unknown in these markets, the lack of coordinated marketing mechanisms, uncertainty about available volumes, and the inability to sustain a continuous flow and ensure the required quality standards. In addition, most producers lack any "exporting mentality", i.e., they consider exporting as a back-up activity to fill the slack in reduced domestic demand when it occurs. Thus, exporting efforts are irregular and nonsystematic. As a consequence, new markets are not reached and old ones are sometimes lost.

There are no direct subsidies for exports. Exporters benefit only from tax exemptions in respect of sales and value-added taxes as well as access to credit at the slightly more favorable interest rates that apply to all exported goods.

3.4.2. Coniferous sawnwood

Production of coniferous sawnwood is concentrated in the south and southeast of the country. Sawmills are, on average, larger, better equipped and managed, and are more able to deal with foreign markets directly than nonconiferous sawnwood operators. Most enterprises are small to medium-sized, and represent an intermediate stage between the less-developed coniferous sawnmills of the north and the highly developed enterprises in other parts of the sector. Most of the deficiencies regarding the lack of "exporting mentality" already mentioned also apply (albeit in an attenuated form) to this category. However, exporting activity is better organized, making the indicative price mechanism less necessary: exports to Europe, Uruguay, Argentina, and Israel are negotiated through an industry–government commission (Comissão Coordenadora de Exportação de Madeira), which has sale agents abroad, centralizes trade negotiations, and assigns export quotas to the associated exporters. [This commission also acts in "imbuia" (*Ocotea porofa*) exports to South Africa.]

3.4.3. Panels

This segment, whose exports totalled $46 million in 1984, has a geographical distribution similar to that of coniferous sawnwood production and shares most of its characteristics, though with a much more developed "export mentality". The severe drop in domestic demand has, in this case, produced a more sustained exporting effort. Producers are organized into an active association (ABIMCE), and the role of CACEX is limited to its clearinghouse function, without fixing indicative prices. Recent increased exports to the United Kingdom, the main customer, have benefited from import tariff reductions. Future expansion in this market, however, could be hindered by the fact that such a reduction applies only to a fixed ceiling that can be attained in the short run.

In addition to standard incentives, panels benefited from the so-called "crédito prêmio", a subsidy on FOB value set at 11% up to the end of 1984. Due to the good results in the foreign trade balance in 1984 and to the policies currently being implemented in agreement with the IMF, the "crédito prêmio" was reduced to 5% in January 1985 and was abolished in mid-1985. This applies to all goods (not only forest products) that benefited from the "crédito prêmio".

3.4.4. Fiberboard

Production of fiberboard is largely concentrated into a few companies (a total of 11 mills), which represent the opposite pole of the "dual" structure of

Brazilian industry. They are modern, large enterprises,using state-of-the-art technology, highly competitive in the world market, and with long-run exporting strategies, supported by sustained and efficient marketing efforts. They use direct enterprise-to-enterprise trading mechanisms, and constitute possibly the only segment of the Brazilian forest sector industry that plays a role in the price-formation process. After accusations of "dumping" in EEC nations (the main buyers), price agreements were recently reached. Fiberboard also benefited from the "crédito prêmio" in addition to standard benefits.

3.4.5. Pulp

The pulp industry is also highly concentrated around four companies that are on an advanced technological level with highly developed exporting capabilities. There is also little intervention by CACEX in the trading process. The association of exporters (ABICEL) plays a significant role in their marketing efforts. The increases in pulp exports, however, has been less than in those in paper in the last two years. This is due to the fact that several of the leading companies are already working at almost full capacity (an exception in the recession-hit Brazilian industry). The huge investments required for capacity expansion in the pulp sector make exporting difficult without government or foreign help, which is scarce in the current situation. In this sense, this segment, though highly developed, is likely to show a low growth rate in the near future. Pulp also benefits from the "crédito prêmio" and standard benefits.

3.4.6. Paper

The paper industry is less concentrated than pulp (161 mills) and exhibits a mixture of large, modern enterprises with less-advanced ones. Exports only recently started to play a significant role. Brazil was a net importer of paper until 1980 and even today is a net importer of some paper products, mainly newsprint, a situation that was reversed in 1986. The industry was able to exhibit a remarkable exporting performance with a 80% increase in value from 1983 to 1984 (with the help, however, of the Canadian labor strike).

The industry has attained a solid stronghold in several foreign markets and will possibly increase further its share in most of them, though the still-low participation of Brazilian companies on the world market as a whole gives little chance for it to play a significant role in the price-formation process. Trade is established on an enterprise-to-enterprise basis with little intervention by government agencies. Paper also benefits from the "crédito prêmio" and standard incentives. From the point of view of international trade, paper is certainly the main hope for the forest sector. Exports of paper in 1984 ($800 million) represented 80% of total exports of the sector.

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CHAPTER 4

Canada: Major Actor in the World Forest Products Trade

David Haley

4.1. Introduction

Canada is one of the world's leading producers of forest products and, by any measure, forestry and forest-based industries are of major importance to the Canadian economy.

The forest industry is the single largest segment of Canadian manufacturing, accounting for about 13% of both shipments of manufactured goods and value added in manufacturing. Total employment attributable to the forest resource is about one million – or almost 10% of the Canadian labor force – including almost 300 000 people directly employed plus over 700 000 employed in secondary and service industries. On a regional basis the forestry sector is far more important than aggregate national figures would suggest.

The Canadian forest products industry is heavily dependent on exports, which normally account for over 50% of total industry shipments. In 1983, the forest products sector showed a trade surplus of $11.7 billion (throughout this chapter dollars are Canadian unless otherwise stated), 76% of the Canadian total, and greater than metals, food and agriculture, fisheries, and the automotive industries combined.

The importance of the forest products industry to the Canadian economy and the heavy export dependence of this sector closely ties the economic health of Canada to world forest products markets and the ability of Canada's forest industries to compete successfully in these markets. The objectives of this chapter are to describe Canada's international trade in forest products and examine those factors that influence the magnitude, direction, and future development of this trade. Following a brief description of Canada's forest resources and forest industries, Canadian trade in forest products will be described in terms of products and volumes traded, major markets,

distribution and transportation, market structures, and barriers to trade. Trends in trading patterns will be discussed.

The principal sources of statistical information used in this study, in addition to those cited in the text, include: Bandrowski and Stanton (1980); Canadian Pulp and Paper Association (1985); Carroll–Hatch (International) Ltd (1984); Council of Forest Industries of British Columbia (1985); Canadian Forestry Service (1985); FAO (1983); *Madison's Canadian Lumber Directory* (1985); Statistics Canada; UNIDO (1983); and Widman Management Ltd (1985).

4.2. Canada's Forest Resources and Industries

Canada is a nation richly endowed with forest resources, having within its boundaries 12% of the world's closed forest area, 6% of the world's total volume of standing timber, and 14% of global coniferous timber volumes (Persson, 1974).

About 37% (281 million ha) of Canada's total land area of 7.6 million km^2 is classified as productive forest land. About 56% of the productive forest area is currently exploitable; 29% is submarginal at present, but is capable of supporting commercial operations if future timber demand and prices justify the necessary infrastructural developments; and 15%, by virtue of location and/or topography and low productivity, is considered to be commercially unexploitable except on a small scale for local use.

Of Canada's total merchantable timber inventory of 19644 million m^3, about 80% comprises softwoods and 20% hardwoods (Bonner, 1982).

While the forest lands of Canada are extensive, they are not highly productive. The average maximum mean annual increment (m.a.i.) for unmanaged forest stands in Canada is 1.5 m^3/ha, ranging from 5.0 m^3/ha in coastal British Columbia to less than 0.5 m^3/ha along the northern edge of the Boreal forest zone (Bickerstaff *et al.*, 1981).

The forest industry in Canada consists of over 5000 companies engaged in logging and the manufacturing of wood products.

In 1982 the total of shipments of all forest products, including roundwood, amounted to $26 billion. Paper and allied industries accounted for about 57% of this total, wood industries 28%, and logging 15% (*Table 4.1*). Among the wood industries, lumber was the most important component, accounting for 61% of total shipments, followed by millwork (19%) and veneer and plywood (9%). In the paper and allied industries sector, shipments were almost equally divided between market pulp, newsprint, other paper and paperboard, and converted paper and board products.

The major producing regions in Canada are British Columbia, Ontario, and Quebec, which jointly account for about 90% of total forest industry shipments (*Table 4.2*). In British Columbia, wood industries predominate, shipments amounting to about one half of the Canadian total annually. British Columbia supports over 60% of Canada's sawmilling activity. Ontario and Quebec are heavily oriented toward pulp and paper production, accounting for about two thirds of Canadian paper and allied industries shipments.

Table 4.1. Canadian forest industries by sector, 1982 (Statistics Canada, Cat. Nos. 25-201, 25-202, and 31-203).

Sector	*Number of establishments*	*Number of employees*	*Value of shipments* ($ million)	*Value added*
Logging	3082	40214	3998	1616
Wood industries	3353	97125	7173	2663
Paper and allied industries	773	122763	14784	6068
Total forest industries	7208	260102	25955	10347

Table 4.2. Canadian forest industries – value ($ million) of shipments by region, 1982 (Statistics Canada, Cat. Nos. 25-201 and 25-202).

	Region						
Sector	*British Columbia*	*Prairie Provinces*	*Ontario*	*Quebec*	*Atlantic Provinces*	*Yukon and NWT*	*Total Canada*
Logging	1933	205	679	777	403	–	3998
Wood industries	3506	610	1256	1515	284	2	7173
Paper and allied industries	2702	712[a]	4841	5023	1048[b]	–	14784
Total forest industries	8201	1527	8303	7315	1735	2	25955

[a] Excluding Saskatchewan.
[b] Excluding Newfoundland.

4.2.1. Roundwood

In 1982 Canada produced 10.1% of the world's total industrial roundwood and 13.6% of coniferous roundwood (FAO, 1983). Distribution of Canadian roundwood production by region is shown in *Table 4.3.* During the period 1978–1982, 97% of roundwood production was for industrial purposes and 3% for fuelwood. Canadian roundwood exports are strictly controlled, and less than 2% of the volume harvested each year is exported. Logging and forest products manufacturing are highly integrated in all regions and only in coastal British Columbia is there a well-developed log market.

4.2.2. Lumber

Of Canada's lumber output, 98% is produced from softwood species; and in 1982 Canadian softwood lumber production accounted for 12% of world output (FAO, 1983). Canadian softwood lumber production, which averaged 41.6 million m^3 per annum in the period 1978–1982, is concentrated in British Columbia, which accounts for about 65% of Canadian sawmill output followed by the other regions (*Table 4.3*).

Table 4.3. Average annual production of major forest products in Canada by region, 1978–1982 (Statistics Canada, Cat. Nos. 36-204, 35-204, 25-201, 35-001, and 36-003).

	Region						
Product	*British Columbia*	*Prairie Provinces*	*Ontario*	*Quebec*	*Atlantic Provinces*	*Yukon and NWT*	*Total*
Roundwood (1000 m^3)	68605	11388	21078	32973	14727	155	148926
Softwood lumber (1000 m^3)	27215	2382	3565	7019	1444	27	41652
Plywood[a] (1000 m^3)	–	–	–	–	–	–	2290
Waferboard/OSB[a] (1000 m^3)	–	–	–	–	–	–	553
Particleboard[a] (1000 m^3)	–	–	–	–	–	–	663
Wood pulp (1000 t)	5333	1018	4192	6600	2988	–	20131
Newsprint (1000 t)	1243	143	1660	4072	1375	–	8493
Other paper and paperboard (1000 t)	801	–	1761	1870	–	–	4874

[a] Volumes shipped rather than volumes produced.

Construction-grade SPF (spruce, pine, fir) lumber accounts for about 70% of total Canadian lumber output and 90% of the lumber produced in Canada in regions other than the British Columbia coast. This product is manufactured in high-speed mills designed to maximize volume production of a uniform product from a diet of small logs. Most large, modern sawmills produce pulp chips as a by-product, and throughout the country there is increasing utilization of wood residues in pulp manufacturing.

On the British Columbia coast, the product mix of the lumber industry is quite different to that of the rest of the country. Here the principal lumber species are Hem fir (western hemlock and other whitewood species), followed by western red cedar and Douglas fir. In addition to construction-grade lumber, British Columbia coastal mills produce an increasing proportion of higher-quality, clear, and factory, or shop, grades.

4.2.3. Wood-based panel products

Wood-based panels produced in Canada include softwood and hardwood plywood, waferboard and oriented-strand board (OSB), and particleboard.

Hardwood plywood accounts for only about 8% of total plywood shipments, which averaged 2.3 million m^3 per annum in the period 1978–1982 (*Table 4.3*). The softwood plywood industry is concentrated in British Columbia.

The Canadian waferboard/OSB industry developed and grew rapidly during the late 1970s, and by 1983 annual shipments reached 851000 m^3. The industry comprises 12 operating mills. Waferboard/OSB is produced mainly from hardwood species. It is used in many of the same construction and industrial applications as Canadian softwood plywood (CSP) and has significantly penetrated traditional markets for this product.

Particleboard production grew rapidly in Canada during the late 1960s and 1970s. Industry shipments reached a peak in 1980 of 724000 m^3 and were 707000 m^3 in 1983. No new capacity has been added during the 1980s or is anticipated.

Medium-density fiberboard (MDF), which on a world basis has enjoyed a greater growth rate in production in recent years than any other wood-based panel product, is not currently produced in Canada. However, a plant under construction in Alberta was scheduled to commence production in 1986.

4.2.4. Wood pulp

The Canadian wood pulp industry has an annual capacity of about 23 million tons, representing about 16% of total world capacity. About two thirds of the wood pulp produced in Canada is manufactured into paper by integrated and affiliated mills, the remainder being shipped as market pulp. Canada is the world's largest producer of market pulps, which are mainly softwood bleached kraft (BKP) grades.

Production of wood pulp is concentrated in Quebec, British Columbia, and Ontario (*Table 4.3*). British Columbia, however, produces more market pulp than other regions, accounting for about 40% of total shipments.

From the late 1950s to the mid 1970s, growth in the Canadian pulp and paper industry was dominated by BKP production. Eight new mills went into operation during the period 1965–1969 and four in 1970–1974. However, since 1975 only one new mill has been built. Modest expansion in pulp capacity since the late 1970s has been the result of additions to existing mills and the construction of thermomechanical pulp (TMP) and chemithermomechanical pulp (CTMP) plants. High capital costs, low return on investment, and wood-supply constraints suggest that the construction of new BKP mills is unlikely within the foreseeable future (Woodbridge, Reed, and Associates Ltd, 1982).

4.2.5. Newsprint

Newsprint is the most important grade of paper produced in Canada, comprising about two thirds of total paper and paperboard production. Average annual production during the period 1978–1982 was 8.5 million tons, making Canada the world's largest producer, with about one third of global newsprint capacity. Canadian newsprint manufacturing is concentrated in Quebec and Ontario (*Table 4.3*).

During the early 1980s, as in other producing areas of the world, there was a substantial increase in Canadian newsprint capacity. Total capacity in 1984 was approximately 5% above that in 1981. Most expansions in newsprint capacity are integrated with TMP mills.

4.2.6. Other paper and paperboard

The Canadian paper and paperboard sector produces a wide variety of products. Production in the period 1978–1982 amounted to almost 5.0 million tons composed of groundwood printing and speciality papers (17%), fine printing and writing papers (16%), linerboard (22%), corrugating medium (10%), boxboard (13%), and other miscellaneous papers (22%).

4.3. Canadian Forest Products in World Trade

4.3.1. Overview

Canada is a major exporter of forest products, and the Canadian forest industry is heavily dependent on export markets. Canadian exports account for about 20% of the total volume of world trade in forest products. During the period 1978–1982 Canada contributed, by volume, 61% of the newsprint, 45% of the softwood lumber, and 34% of the wood pulp traded on a global basis and was the major exporter of each of these commodities (FAO, 1983).

The forest products sector in Canada consistently shows a trade surplus. In the period 1979–1983 forest products exports averaged $12.6 billion per annum and imports $1.5 billion per annum for an average annual surplus of $11.2 billion, or 1.2 times Canada's total trade balance for all products (*Table 4.4*). Between 1971 and 1981 Canada's annual trade balance, net of forest products, was negative. During this period, Canada's net trade balance in forest products increased at an average annual rate of 5.5% in real terms.

Canada's forest products exports are dominated by newsprint, wood pulp, and softwood lumber. During the period 1979–1983 these three commodities accounted for 30%, 27%, and 27% of total forest products exports, respectively. Other exports included paper (other than newsprint) and paperboard products (6%) and plywood, veneer, and wood-based building boards (3%) (*Table 4.5*). Imports mainly comprised paper, paperboard, and other more highly manufactured forest products.

The most important export market for Canadian forest products is the USA, which in 1983 accounted for 72% of the total, followed by the European Economic Community (EEC) (12%), Japan (6%), the Middle East and North Africa (2%), and Australia (1%). Within the EEC, the United Kingdom is the most important customer for Canadian forest products.

Table 4.4. Canadian balance of trade ($ million) in forest products, 1979–1983 (Statistics Canada, Cat. Nos. 65-202 and 65-203).

Year	*Exports*	*Imports*	*Forest products*	*All products*
1979	11898	1428	+10470	+2770
1980	12842	1338	+11504	+6885
1981	13053	1628	+11425	+4329
1982	12188	1302	+10886	+16674
1983	13370	1683	+11687	+15377
Average 1979–1983	12670	1475	+11195	+9207

Table 4.5. Canadian exports of forest products ($ million) by commodity group, 1979–1983 (Statistics Canada, Cat. No. 65-202).

Year	*Lumber*	*Plywood, veneer, building boards*	*Wood pulp*	*News-print*	*Other paper, paperboard*	*Other*	*Total*
1979	3903	310	3083	3222	703	677	11898
1980	3368	332	3873	3684	854	731	12842
1981	2029	310	3819	4326	806	763	13053
1982	2954	314	3221	4086	829	784	12188
1983	4002	375	3058	4005	916	1014	13370
Average 1979–1983	3451	328	3410	3864	822	794	12670

4.3.2. Softwood lumber

In the period 1979–1983, Canada's softwood lumber exports averaged 29.8 million m^3 per annum with a value of $3349 million. British Columbia accounts for about two thirds of Canada's softwood lumber exports, followed by Ontario and Quebec (30% combined). The main export market for Canadian softwood lumber is the USA, which accounted for about 56% of total Canadian lumber shipments and 79% of exports during the period 1979–1983 (*Table 4.6*). Japan and the EEC, during the same period, accounted for 8% each of Canada's lumber exports.

The USA

Since World War II, the United States has become increasingly dependent on softwood lumber imports. This increasing import demand has been met almost exclusively by Canada, whose share of US softwood lumber consumption increased from about 12% in 1960 to over 20% in the early 1970s and close to 30% in the early 1980s. In 1983 Canada supplied 30.6% of US softwood lumber consumption and close to 100% of US softwood lumber imports.

Table 4.6. Canadian softwood lumber exports (million m^3) by destination, 1979–1983 (*Madison's Canadian Lumber Directory*, 1985).

Year	*USA*	*Japan*	*EEC*	*Middle East and N. Africa*	*Australia*	*Other*	*Total*
1979	25.442	2.392	2.620	.283	.325	.233	31.295
1980	21.901	2.556	2.984	.830	.298	.364	28.933
1981	21.317	2.047	2.446	.832	.372	.252	27.266
1982	21.321	2.474	2.175	.842	.249	.515	27.576
1983	28.097	2.114	1.865	1.157	.198	.499	33.930
Average 1978–1983	23.616	2.317	2.418	.789	.288	.373	29.800

In certain regions of the United States, dependence on Canadian softwood lumber is much greater than the national average. In 1981, Canadian imports accounted for 57% of total lumber consumption in the Northeast and 43% in the North Central region.

Lumber is moved from Canada to the USA by road, rail, and water transportation. Transportation by road has certain advantages, including speed of delivery, lower handling costs, the ability to deliver small volumes directly to the purchaser, and better control over inventories. Producers in Ontario and Quebec enjoy these advantages by virtue of their proximity to the major markets of the northeastern USA. Eighty percent of lumber shipments to the United States from these provinces is by road and the remainder by rail.

Lumber cannot generally be moved by road in North America for distances in excess of 1500 miles. For this reason, about 70% of the lumber shipped to the USA by western Canadian producers is transported by rail.

In recent years rail freight rates have increased faster than road transportation costs, which has placed western Canadian lumber producers at a competitive disadvantage. This situation was exacerbated by deregulation of the US railroads in 1980.

Lumber producers in coastal British Columbia enjoy a competitive advantage over their counterparts in the western United States as a result of a US law which requires US shippers to use domestic carriers for transportation between domestic ports. British Columbia shippers can use foreign vessels offering more competitive freight rates to deliver lumber to the US Atlantic coast and Gulf ports.

There are virtually no barriers to trade in North American softwood lumber markets. Under the 1972 GATT negotiations (the Kennedy Round), the USA and Canada agreed to duty-free entry of softwood lumber to both countries. In addition, there has been agreement between them on common lumber grading standards, sizes, stress ratings, and span tables.

In recent years Canada's increasing share of the US softwood lumber market in a period of severely depressed market demand and prices has raised protectionist pressures against Canadian lumber in the US. In 1981 US Pacific Northwest sawmill operators and political leaders claimed that their industry

was threatened with injury by unfair Canadian government subsidies, including the determination of stumpage prices for public timber, government support of capital development and marketing programs, transportation costs, and labor-training subsidies. Subsequently, the Pacific Northwest producers were joined by a broader spectrum of US lumber producers and trade groups representing about 25% of the industry. In 1982, after seven months of investigations and hearings, the International Trade Administration declared the subsidy received by the Canadian producers to be *de minimus* and that no countervailing duties were to be levied.

In 1984 protectionist forces in the USA regrouped in greater strength and through the political process have had bills introduced in the US Congress which would impose tariffs on softwood lumber imports or, through quotas, would limit Canada to a 25% share of the US softwood lumber market.

The North American softwood lumber market is almost a textbook example of a perfectly competitive market. The product, mainly construction-grade dimension lumber, is homogeneous; there is good knowledge of the market on the part of sellers and buyers, with price and volume information being exchanged almost instantaneously by telephone and telex; and no one firm has a large enough market share to enable it to influence price.

Canadian softwood lumber exports are sold either directly by the manufacturer to industrial consumers or large retail outlets or, more commonly, through wholesalers. There are two types of wholesalers: office wholesalers or brokers, who trade lumber without taking physical possession of the product and have no inventory facilities; and area wholesalers, or wholesale distributors, who physically handle the lumber and maintain regional distribution centers in the major market areas. There are approximately 1500 lumber wholesalers in Canada and the USA.

The past five years have seen the development of lumber transfer yards (LTYs), which are now located in about 40 Canadian and American cities from Minnesota eastwards. LTYs handle lumber from a number of different producers and wholesalers. For a handling fee they will receive, unload, inventory, and reload lumber for shipment, generally by road, to its final destination.

Long-term lumber sales contracts are uncommon. The majority of softwood lumber in North America is sold on the spot market. Usual terms are 2% discount for immediate cash payment or the full balance due in 10, 15, or 30 days.

Japan

Japan is Canada's largest offshore softwood lumber market, accounting for about 8% of total exports during the period 1979–1983. Canada supplies about 7% of Japan's total softwood lumber consumption and about 55% of its softwood lumber imports.

British Columbia supplies over 90% of Canada's lumber exports to Japan, which accounts for about 35% of the province's exports to offshore markets.

The principal product exported is Hem fir, cut to traditional Japanese sizes, the most common product being known as "baby squares". However, exports of Canadian Lumber Standard (CLS)-dimension lumber are increasing, including SPF from the British Columbia interior and eastern Canada. In 1973 Japanese building codes were amended to allow the use of lumber cut to either CLS or American Lumber Standard (ALS) sizes. Following this important change, promotional efforts to penetrate the Japanese home construction market have met with some resistance and success has been limited. Today, less than 2% of the houses built in Japan are to North American standards. The marketing strategy of British Columbia coastal producers is to increase the volume of lumber cut to traditional Japanese standards.

Japan levied a 10% tariff on "whitewood" lumber, imported from nonpreferred nations, which includes Canadian SPF. This tariff was reduced, under agreements reached in the Tokyo Round of GATT negotiations, to 8% in 1985.

Foreign lumber entering Japan is regraded and while in recent years Japan, Canada, and the USA have moved toward compatible grading standards, this practice remains a significant barrier to trade.

The Canadian share of the Japanese lumber market is modest, as mentioned above, and Canadian shippers face increasing competition from lumber producers in the US Pacific Northwest, who account for about 40% of North American lumber exports to Japan. Also, New Zealand is aggressively promoting *radiata* pine lumber in Japan in an attempt to have this product accepted and upgraded in the Japanese market. Success in this regard could have a significant impact on Canada's market share. In addition, Japan imports large volumes of softwood logs from the United States, the Soviet Union, Chile, New Zealand, and Canada, which compete directly with lumber imports.

In view of these considerations, Canadian producers, for the most part, have no influence on lumber prices in the Japanese market. They are, as in the case of the US market, price takers. Exceptions to this general rule may exist in the case of certain speciality products, like yellow cedar. Coastal British Columbia has the only substantial inventory of this species, and since British Columbia's log export controls place a complete ban on the export of yellow cedar in the form of roundwood, an increasing number of mills specialize in sawing them to Japanese specifications.

Much of the lumber cut to Japanese specifications, or into squares for remanufacture, are handled by Japanese trading companies, which coordinate the flow of lumber into Japan and, through complex financing arrangements with wholesalers and sawmills, assume a high level of risk.

In the case of lumber cut to CLS specifications, shippers frequently deal directly with primary wholesalers. A third option involves commission agents or brokers who arrange sales directly between Canadian sawmills and Japanese buyers in competition with the major shippers. Such arrangements may be with trading companies, primary wholesalers, sawmills, or construction companies.

The European Economic Community

The United Kingdom is Canada's most important market in the EEC, accounting for over 40% of its European exports. During the period 1978–1982, Canada supplied 20% of the softwood lumber consumed in the United Kingdom and 23% of that country's softwood lumber imports. However, during 1983–1984, this market share declined to about 19% of imports, owing to the strength of the Canadian dollar and strong competition from other producing regions.

In the past the United Kingdom mainly imported Hem fir from the British Columbia coast. In recent years, however, shipments of SPF-dimension lumber have increased to almost 50% of total softwood lumber exports, which increase has allowed eastern Canadian producers to penetrate the United Kingdom market.

Continental Europe is Canada's third largest offshore lumber market, after Japan and the USA, accounting for about 3% of total softwood lumber exports in the period 1978–1982. Apart from France, which imports a substantial volume of construction-grade lumber including some SPF-dimension lumber, the Continent is mainly a market for select and shop grades supplied exclusively by the British Columbia coast producers. In the 1978–1982 period Canada supplied about 3% of softwood lumber consumption in the continental EEC countries and a modest 6% of softwood lumber imports.

The EEC countries do not levy tariffs against softwood lumber imports. Competition in this market from Sweden, Finland, the USSR, and, increasingly, the USA is vigorous, and Canadian producers are finding it increasingly difficult to maintain their market share in the face of currency devaluations in the Scandinavian countries. There were marked declines in Canadian sales to the region in 1983–1984.

As in the case of the Japanese market, intense competition, particularly in whitewood construction-grade lumber, combined with Canada's relatively low market share, mean that Canadian producers are mainly price takers in the markets of Western Europe. Exceptions can be found in the markets for certain speciality products, such as clear grades of Douglas fir in Italy and the West Germany.

The major Canadian shippers to the EEC maintain subsidiary sales organizations, or have agents, in the major European cities. Subsidiary sales companies deal with major importers on behalf of the shipper. Agents perform a similar function but are paid on a commission basis and may sell products for a number of shippers from several countries.

Shippers generally purchase lumber FAS from suppliers and sell it on a CIF and CF basis, but there are exceptions to these practices.

Australia

Australia is a traditional and well-established market for Canadian lumber, accounting for about 1% of exports by volume. Prior to the growth of the

Japanese market in the early 1960s, Australia was Canada's major market in the Pacific area. Canadian lumber shipments to Australia originate entirely in British Columbia and in the period 1979–1983 averaged 288 000 m^3 per annum. While the volume of Canada's lumber exports to Australia is modest, in the period 1978–1982, that country supplied almost 19% of Australian softwood lumber consumption and about 48% of its softwood lumber imports.

Australia levies tariffs, ranging between 2% and 20%, against all lumber imported from Canada depending upon species, grade, and size. Generally, smaller sizes face a higher tariff than larger pieces suitable for remanufacture. CLS-dimension lumber faces a tariff of 20%.

Canada faces vigorous competition in the Australian market from lumber manufacturers in the US Pacific Northwest, who produce and export a similar range of species and grades.

In Australia, as in Europe, lumber sales are handled through subsidiaries of major shippers. However, in this market a substantial volume is sold directly to end users.

The Middle East and North Africa

During the 1970s, following the 1973 energy crisis, countries of the Middle East and North Africa emerged as important markets for Canadian softwood lumber, particularly Egypt, Algeria, Saudi Arabia, and Kuwait. Shipments to these countries annually account for about 1–2% of Canadian lumber exports. Some sales are made in CLS sizes, but increasingly mills are cutting to the traditional metric dimensions preferred in the region.

Both British Columbia and eastern Canadian producers (particularly Quebec) participate in this market. In 1983, 47% of Canada's lumber shipments to Middle Eastern and North African countries originated in British Columbia and 34% in Quebec. Canadian shippers to the region face stiff competition from the USSR, Scandinavia, Western and Central Europe, and the USA.

Other Lumber Markets

Canadian lumber producers are seeking and promoting new lumber markets in the Asia–Pacific region. Of particular importance are the People's Republic of China (PRC) and South Korea. The PRC, with its population of over one billion people and softwood lumber consumption of only 13 million m^3, is currently the center of much attention. Canadian lumber exports to the PRC, which originate entirely in British Columbia, commenced on a very small scale and by 1984 had risen to 330 000 m^3 – only slightly less than shipments to Australia for that year and accounting for about 1% of Canada's total lumber exports. While the PRC's major import demand is for roundwood, Canadian producers are optimistic that, given the continuation of economic expansion and the current high demand for housing, softwood lumber imports will continue to expand.

A major area for concern is the imbalance of trade between Canada and the PRC. In 1984 the value of Canada's exports to the PRC amounted to $1.3 billion, while goods valued at only $334 million were imported.

4.3.3. Wood-based panel products

Softwood plywood

In the period 1979–1983 Canada's exports of softwood plywood averaged about 454 000 m^3 per annum, which amounted to approximately 23% of average annual shipments. Over 98% of softwood plywood exports originate in British Columbia.

The principal foreign market for softwood plywood is the EEC, which accounted for 85% of Canadian exports in the period 1979–1983 (*Table 4.7*), and over 91% in 1984. Within the EEC, the United Kingdom is by far the most important single market (47% of total exports in 1984), followed by Belgium/Luxemburg and West Germany.

Table 4.7. Canadian softwood plywood exports (m^3) by destination, 1979–1983 (Statistics Canada, Cat. No. 65-202).

Destination	*1979*	*1980*	*1981*	*1982*	*1983*	*Average 1979–1983*
United Kingdom	175 210	187 696	187 751	162 311	189 299	180 453
Belgium	14 093	38 429	33 006	37 081	33 660	31 254
West Germany	70 372	68 615	43 767	47 165	56 946	57 373
Denmark	50 247	41 054	8 592	29 919	21 739	30 310
Italy	17 288	31 015	23 110	13 262	12 333	19 402
France	27 897	39 751	16 976	14 707	10 236	21 913
Netherlands	78 708	60 588	23 896	27 516	12 230	40 588
Ireland	1 064	3 913	5 152	2 682	5 316	3 625
Total EEC	434 879	471 061	342 253	334 643	341 759	384 919
Other	59 305	77 248	42 679	76 440	90 266	69 188
Total	494 184	548 309	384 932	411 083	432 025	454 107

During the last decade Douglas fir plywood (DFP) has been replaced by Canadian softwood plywood (CSP) as the major Canadian plywood commodity entering world trade. In 1973, only 2% of Canadian plywood exports were CSP, but by 1982 this proportion had increased to 66% and reached 68% in 1984. Only in West Germany and the Netherlands is DFP still the favored product. CSP is mainly used for construction purposes, and during the 1970s benefited from the vigorous campaign mounted by the Canadian wood products industry, in cooperation with government, to promote platform frame construction methods in the United Kingdom and other EEC countries.

Canadian plywood faces increasing competition overseas from waferboard, in the sheathing market, and from hardwood plywood, both tropical and temperate, in the joinery and concrete form market. The US plywood industry, faced with increasing capacity in the southern states and increasing domestic competition from alternative wood-based panel products, is actively promoting export sales in Europe and elsewhere. In 1983, US softwood plywood sales to the UK equaled Canada's share (about 20%) of the market.

Prior to 1974 Canadian plywood entered the UK market duty-free under the preferential tariff structure available to Commonwealth countries. Since 1974, when the UK entered the EEC, the United Kingdom and other European countries have permitted duty-free entry of specified types of softwood plywood up to a quota limit of 600000 m^3 annually, pro-rated on a country-by-country basis. Imports beyond the quota limit to any country are currently subject to a tariff of 10.3%, which has been reduced from a pre-1979 level of 13% under the Tokyo Round of the GATT. The quota is open to all countries, and there is competition between producers to capture as much of it as possible. This competition has become increasingly intensive since the USA entered the market on a larger scale in the early 1980s. As a result, 80–90% of the softwood plywood imported to the EEC is landed during the first six months of the year.

Japan, until recently a net exporter of plywood, is now a net importer and is beginning to import small volumes of softwood plywood from both the United States and Canada. In 1984, the country imported about 22000 m^3 from British Columbia (about 5% of Canadian exports). Japan levies a 15% tariff against softwood plywood, which is not scheduled for further reduction under current trade agreements.

Canada exports virtually no softwood plywood to the United States, as a result of a 20% tariff combined with the fact that the USA itself is a net exporter of softwood plywood and has a highly competitive, aggressive plywood industry.

Tariffs on softwood plywood shipments between Canada and the United States (Canada currently imposes a 15% tariff against softwood plywood imports from the USA) were originally due to be lowered substantially by 1987 under the Tokyo Round of GATT, providing the two countries could agree on common grading standards. Such a consensus has not been achieved, and both sides have agreed to maintain existing tariff structures.

Productive capacity is highly concentrated in the softwood plywood industry, the eight largest producers accounting for over 80% of total capacity, and there is some evidence of oligopolistic behavior in the domestic market, including price leadership and relative price stability (Schwindt, 1977). Distribution channels are from producers through wholesalers, both captive and independent, to retailers or directly to major end users. Producers may also sell directly to large industrial customers and contractors or to buying groups representing retailers. Producers publish list prices periodically. These are frequently guaranteed for six months, and some producers allocate quotas to major wholesalers. There is some price discounting below list. While conditions in domestic plywood markets are far from competitive, producers are severely constrained in their pricing policies by the increasing availability in the marketplace of substitute products and the ever-present threat of US imports.

Arrangements for the overseas distribution of softwood plywood are similar to those described earlier for lumber. In the UK imports are sold to a subsidiary company that maintains inventories and sells to British importers. In

other EEC countries the product is sold directly to importers, or in some cases (for example, West Germany) sales are through agents.

In the EEC, Canadian plywood must compete with many substitute products, both wood- and nonwood-based, and, increasingly, with US softwood plywood imports. As a result, pricing strategies for Canadian shippers are severely constrained, the main concern being to price at a competitive level.

4.3.4. Other wood-based panel products

Canada is a net exporter of both waferboard and particleboard and an importer of medium-density fiberboard. Exports of particleboard in 1984 amounted to 183000 m^3, or 23% of total shipments, while waferboard exports were 575000 m^3, or about 50%.

Unlike softwood plywood, Canada's principal market for reconstituted wood-based panel products is the United States. Waferboard and particleboard face lower tariffs in the USA than in the EEC and Japan and, unlike plywood, are manufactured to the same standards and specifications in both Canada and the United States. In addition, the current depressed value of the Canadian dollar gives Canadian producers a significant advantage in the US market.

The current tariff on both waferboard and unmanufactured particleboard entering the United States is 5.5% but, under the Tokyo round of GATT, is scheduled to fall to 4.0% by 1987. The EEC's tariff on particleboard and waferboard is currently 10.5% and is scheduled to remain at 10% by 1987. Japan currently levies a tariff of 14% against reconstituted wood panels, which is scheduled to fall to 12% by 1987.

4.3.5. Wood pulp and paper

In the period 1979–1983 Canada's exports of wood pulp averaged 6.8 million tons per annum, or about 33% of total production with an average annual value of $3405 million. Chemical pulp accounted for 96% of total exports and mechanical pulp 4%.

In 1983 Canada exported 6.82 million tons of wood pulp, of which 49% originated in British Columbia. The latter exports approximately 55% of its wood pulp production annually.

Major export markets for Canadian wood pulp (*Table 4.8*) include the United States (50%), the EEC (29%), Japan (12%), and Asia (other than Japan) (6%). Lesser markets are in Latin America, Africa, and Oceania.

USA

The USA is the principal export market for Canadian wood pulp, although it has been declining in importance for many years. In the early 1950s it accounted for over 90% of Canadian wood pulp exports. This proportion

Table 4.8. Canadian wood pulp exports (thousand tons) by destination, 1979–1983 (Canadian Pulp and Paper Association, 1985).

Year	*USA*	*EEC*	*Japan*	*Asia*[a]	*Other*	*Total*
1979	3732	2065	831	282	180	7090
1980	3516	2273	901	319	239	7248
1981	3436	2016	714	366	212	6744
1982	3087	1792	687	379	154	6099
1983	3387	1832	790	587	227	6823
Average 1979–1983	3432	1996	785	387	202	6801

[a]Excluding Japan.

declined to about 75% in the early 1960s, 60% by 1970, and currently stands at about 50%.

About 30–40% of Canadian pulp imported to the USA is in the form of captive shipments from Canadian subsidiaries of American firms or to US affiliates of Canadian companies. The balance is in the form of true market pulp.

The US pulp and paper industry is a net importer of bleached softwood kraft and sulfite pulp, and a net exporter of bleached hardwood kraft pulp. Some mechanical pulp is also imported, but only an insignificant volume of unbleached kraft and semi-chemical pulp. During the period 1978–1982, Canada supplied about 94% of the US wood pulp imports and 7% of total consumption. About half of all the market pulp purchased by US paper and paperboard mills is imported from Canada.

While there is an active spot market for pulp, the majority is sold in the US market under long-term contracts with an average life of about five years. Some contracts are "evergreen" in that they are automatically renewed every two years. Pricing under a contract is normally reviewed quarterly.

There are no tariff barriers against pulp entering the USA. Opinions concerning the structure of North American pulp markets are mixed. Production is moderately concentrated, prices are relatively stable, and there is some evidence of price leadership (Rich, 1970). Armstrong (1975), Guthrie (1972), and Schwindt (1977) all concluded that the pulp market more closely resembles an oligopolistic than a purely competitive structure. On the other hand, the demand for market pulp, which must compete with captive pulp supplies, is very volatile. List prices, while stable over periods of several months, do exhibit cyclical behavior, and vigorous competition between producers appears to take place through price discounts during periods of weak demand.

Europe

Europe is Canada's second most important market for wood pulp, accounting for about 29% of the volume exported in 1983. The United Kingdom, which has declined in relative importance during the last two decades, accounts for about 16% of Canada's European sales, compared with 65% in the early 1960s.

British Columbia is the major supplying region, accounting for 67% of Canada's pulp shipments to Europe in 1983.

In the 1960s the Scandinavian countries were capable of meeting Western Europe's pulp deficit. However, during the 1970s growth in pulp consumption in Western Europe exceeded the increase in pulp capacity in Scandinavia and Western Europe by more than 1% per annum, and by 1980 the Scandinavian pulp industry was capable of supplying less than 65% of European import demand. Exports of Canadian pulp to Europe increased from 1.32 million tons in 1970 to 2.27 million tons in 1980.

During the period 1978–1982, Canada supplied 14% of the pulp consumed by the EEC and 22% of the EEC's pulp imports.

As in the USA, selling agreements for pulp in Europe are dominated by long-term contracts, frequently of an evergreen nature, with prices adjusted quarterly on a CF basis. Transportation is largely by producer-owned or chartered ships. There are no tariffs levied against wood pulp in the European market. As in North America, European pulp markets have many of the characteristics of an oligopoly but with some price competition by means of discounts during periods of low demand. In December 1984 the EEC found 41 companies, including six Canadian ones, guilty of acting as a cartel in order to restrict price competition for pulp in European markets. Charges were based on the fact that pulp producers quote the same price on a quarterly basis in US dollars. Nominal fines were levied when producers undertook to modify marketing practices and quote prices in local currencies. Several of the companies involved are appealing the decision to the European Court of Justice.

Japan

Japan's pulp and paper industry experienced rapid growth in the 1960s. By 1970, the country was second only to the USA in paper and paperboard production. During the 1960s and 1970s increases in paper production exceeded pulp production and, by 1980, 17% of the virgin wood pulp consumed was imported. Japan became a significant market for Canadian pulp producers in the late 1960s and in 1983 accounted for 11% of Canadian pulp exports. British Columbia is the principal supplier accounting for over 80% of Canadian pulp sales to Japan in 1983.

During the period 1978–1982, Canada supplied 7% of Japan's wood pulp consumption and over 40% of its wood pulp imports.

Pulp sales in Japan are mainly on a spot-market basis between producers and Japanese trading companies. Long-term contracts are uncommon. Two British Columbia pulp mills are partially owned by Japanese interests, but only a relatively small proportion of these mills' output is sold to Japanese parent companies.

Pulp is sold on a CF basis to the trading companies, who maintain inventories of pulp in Japan and sell to paper companies, frequently in small volumes. Japan levies a tariff of 2.4% on mechanical and chemical pulp, which is scheduled to drop to zero under the Tokyo Round of the GATT.

Other Markets

Pulp markets other than the USA, Europe, and Japan are relatively important for British Columbia, whose sales are more diversified than other producing regions in Canada. In 1983 British Columbia accounted for 77% of Canada's wood pulp sales to other countries. Of major importance are countries of the Asia–Pacific region, particularly the People's Republic of China, South Korea, Taiwan, and Australia. Wood pulp exports to the PRC, which commenced in the late 1970s, reached 298000 tons in 1983, making it Canada's fourth largest wood pulp market after the USA, the EEC, and Japan.

The outlook is a for a dramatic and sustained rise in the demand for wood pulp in Asian markets through to the year 2000, and this region is expected to become an increasingly important component of Canada's export market.

4.3.6. Newsprint

Newsprint is by far the most important paper product among Canada's exports. In 1983 Canada exported paper products valued at $5.1 billion, of which newsprint comprised 80%.

In the period 1979–1983, Canada's exports of newsprint averaged 7.58 million tons per annum, or about 91% of total shipments, with an average value of $3864 million per annum. In 1983 Canada exported 7.47 million tons of newsprint, which represented 64% of total world trade.

The major export market for Canadian newsprint is the USA, which, in the period 1979–1983, accounted for 80% of Canada's exports. Other markets include the United Kingdom (6%), Western Europe (2%), Latin America (7%), Asia (4%), and Australia (1%) (*Table 4.9*). Japan is an insignificant market for newsprint, accounting for only about 4% of Canada's annual newsprint exports to Asia.

USA

The United States has traditionally been the primary market for Canadian newsprint. The growth of Canada's newsprint industry has been based on the relatively low cost of energy in the form of hydroelectric power, the availability of softwood timber supplies suitable for the production of groundwood pulp, and the proximity of the huge US market, which accounts for more than 40% of total global consumption.

In the early 1960s the US newsprint industry, mainly located in the South, produced about 2 million tons annually and supplied about 28% of domestic consumption, 70% being supplied by Canada. The expansion of US newsprint capacity in the South, the Pacific Northwest, and the Northeast continued during the 1960s and 1970s at an average annual rate of 3.9%, compared with an increase in consumption of 2.0% per annum. During the period

Table 4.9. Canadian newsprint exports (thousand tons) by destination, 1979–1983 (Canadian Pulp and Paper Association, 1985).

Year	*USA*	*UK*	*Western Europe*[a]	*Latin America*	*Asia*	*Oceania*	*Other*	*Total*
1979	6371	398	187	445	292	108	7	7808
1980	6118	442	181	518	267	111	5	7642
1981	6058	541	189	625	356	97	1	7867
1982	5596	541	170	471	240	62	41	7121
1983	6036	502	163	428	245	54	42	7470
Average 1979-1983	6036	485	178	497	280	86	19	7582

[a]Excluding UK.

1978–1982, Canada's average annual export of newsprint to the USA was 5.60 million tons, which accounted for about 60% of US newsprint consumption and over 95% of its imports. The USA is expected to become increasingly self-sufficient in newsprint, reducing Canada's market share to less than 50% by 1990.

While a spot market does exist in North America, most Canadian newsprint exports to the USA are sold under long-term contracts between producers and major publishing companies or distributors. Newsprint prices, unlike pulp prices, are not announced quarterly but are set until further notice. Price discounting is not as common as in pulp markets but it does occur.

Newsprint markets are far more regionalized than pulp markets. British Columbia producers mainly supply markets in the western USA, while eastern producers supply the major markets in the northeastern and northcentral states.

There are no tariffs levied by the United States against newsprint imports. There is a high degree of seller concentration in both eastern and western US newsprint markets, and pricing behavior is characteristic of an oligopoly with a well-developed pattern of price leadership (Dagenais, 1976; Schwindt, 1977).

Western Europe

The United Kingdom is the most important market in the region, accounting for 80% of Canada's newsprint exports to Europe in 1983.

Much of Western Europe's import demand for newsprint, which amounted to 3.06 million tons per annum in the period 1978–1982 (or 68% of total consumption), is supplied by Scandinavia. The Scandinavian countries increased newsprint production by 3.3% during the 1970s, compared with an average increase in Western European consumption during the decade of only 1% per annum.

Canada is a major supplier of newsprint to the United Kingdom, accounting for 34% of consumption and over 40% of imports during the period

1978–1982, but only a marginal supplier to continental Western Europe, where its market shares in the 1978–1982 period amounted to only 5% of consumption and 8% of imports.

As in North America, although a spot market for newsprint exists in Europe, most sales are made under long-term contracts with publishing companies.

The EEC has historically allowed Canada access to their market under a duty-free quota of 1.5 million tons per annum, which was shared between Scandinavian and Canadian producers. In 1983, when the Scandinavian countries obtained free trading rights with the EEC, the quota was unilaterally reduced to 500000 tons, well below Canada's annual shipments in recent years of 650000–700000 tons. In 1984 a special panel of GATT ruled that the EEC was in violation of the general trade agreement to which they were signatories and that, while the Community has the right to lower the quota, it cannot do so unilaterally but must negotiate any change with Canada and is obliged to maintain the previous quota until a new agreement is in place. Further negotiations between the EEC and Canada resulted, in December 1984, in a settlement that gives Canada a duty-free newsprint quota of 600000 tons. Beyond the limit of this quota, newsprint is subject to a tariff of 5.7%, which is scheduled to drop to 4.9% by 1987.

4.3.7. Other paper and paperboard

Although Canada's paper and paperboard sector produces mainly for the domestic market, it has enjoyed a positive and increasing trade balance for over a decade. In this chapter "paper" excludes newsprint. In 1983 the Canadian paper and paperboard industry shipped products valued at $3091 million, of which 69% were sold in domestic markets. During the period 1978–1982 Canada's trade balance in paper (excluding newsprint) and paperboard products averaged $401 million per annum compared with $21 million (both in constant 1981 prices) per annum for the five-year period 1970–1974.

In 1983 paper and paperboard exports, by value, included groundwood printing and writing papers (28%), other printing and writing papers (15%), wrapping and building papers (18%), sanitary and other papers (10%), linerboard and corrugating medium (13%), other board products (4%), and converted paper products (12%). Imports of paper and paperboard products in 1983 included printing and writing papers (40%), other paper and paper products (15%), linerboard and corrugating medium (9%), and other paperboard products (36%).

The majority of paper and paperboard exports originate in Ontario and Quebec, which accounted for 46% and 30%, respectively, of the value of Canadian exports in 1983. In 1983 these provinces accounted for 92% of printing and writing paper exports, 94% of sanitary paper exports, and 86% of building paper and board exports. British Columbia's paper and paperboard exports are mainly composed of wrapping and packaging papers.

Much of the growth in paper and paperboard exports in recent years has been in groundwood printing and specialty papers. Between 1974 and 1983 Canadian production of these products increased at an average annual rate of about 9.6% compared with an average growth rate of 1.3% for all paper and paperboard production. Canadian groundwood printing and specialty paper capacity, mainly in uncoated grades, increased by about one third between 1980 and 1983 to over 950000 tons. Over 50% of annual production is exported. The USA is the major market for groundwood printing and specialty papers accounting for over 80% of Canada's exports. Under the Tokyo Round, US tariffs on printing papers will fall to zero by 1987 while the EEC will retain a 9.0% tariff against these products and Japan a 5.1% tariff. Strong market growth for groundwood papers in the US is expected to continue to 1990, and it is anticipated that Canada will increase its share of this market in uncoated grades.

During the 1950s and 1960s, Canadian producers of fine printing and writing papers were protected by a 22.5% tariff. Under the Kennedy Round, which concluded in 1967, this duty was reduced to 12.5% and 15.0% for printing and writing papers, respectively. These tariff reductions resulted in increased Canadian imports of fine paper from 7% of apparent consumption in the period 1965–1969 to 31% in 1975–1979. Under the Tokyo Round, Canada will further reduce tariffs on fine papers to 6.5% by 1987. These reductions will likely lead to a greater dependence on imports and, although the USA will reduce tariffs to zero on fine printing papers and 2.4% on writing papers by 1987, Canadian exports of these products are not anticipated to increase substantially.

The Canadian fine-paper industry suffers from lack of specialization, which excludes it from the substantial economies of scale enjoyed by its competitors. For example, seven companies in Canada manufacture almost as many grades of paper (120–150) as the entire US industry. Modernization and rationalization of the industry are underway, which are designed to improve profitability and minimize the vulnerability of the industry to competition in traditional domestic markets.

Canada's exports of paperboard are dominated by linerboard and corrugating medium. In 1983 linerboard accounted for 65%, by value, of total paperboard exports, mostly in unbleached kraft grades. About 70% of Canada's linerboard production, which amounts to about 1 million tons annually, is tied to domestic, container-manufacturing plants. The balance is exported, primarily to offshore markets. Due to its location, the British Columbia industry is more export-oriented than the industry in eastern Canada.

World trade in linerboard is dominated by the USA with a market share of over 60%. Canada, on the other hand, supplies only about 10% of global linerboard exports. Canadian linerboard capacity has remained virtually unchanged for more than a decade, and major future increases in either capacity or trade are not anticipated. Under the Tokyo Round, containerboard, including linerboard, enters the USA duty-free, EEC tariffs on paperboard are reduced from 13% to 10%, and Japanese tariffs on paperboard are reduced from 7.5–10% to 4.9–5.1%, depending on grade.

Corrugating medium is not a major item of world trade. Canada produces about 500000 tons of corrugating medium annually, of which approximately one third is exported, mainly to Latin America, the USA, and Europe. Canada's exports account for about 25% of world trade in corrugating medium, the balance being mainly supplied by Scandinavian producers.

Canada exports a wide range of converted paper products, but in relatively small volumes. Between 1974 and 1983 Canadian exports of these products increased at an average rate of more than 8% per annum in real value. The most important growth in recent years has taken place in the paper container industry, which more than doubled the value of its exports between 1980 and 1983. The Canadian wallpaper industry is very export-oriented, accounting for 44% of converted paper product exports in 1983.

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CHAPTER 5

Eastern Europe: Changing Partners in the International Forest Products Trade

Eva Ozsvald

5.1. Introduction

A review of the literature on commodity trade modeling leads one to conclude that there is a widespread belief that the general equilibrium theory is accurate enough to express the basic laws of production, prices, and international exchange of commodities for all regions of the world. To make the models more realistic, this basic structure can be supplemented by market imperfections such as quotas, tariffs, etc. A great deal of accumulated empirical and also theoretical knowledge makes us cautious about these paradigms in general, but certainly studying trade practices of the socialist countries convinces us that this approach is unacceptable when applied to the USSR and Eastern Europe in global trade models.

The market economies – however they might differ – all have some common basic rules, such as the profit motive and the informative and allocational function of prices, which can be considered axiomatic in model building. Quite different is the world of the centrally planned economies, where all forests and factories are nationalized, and where the economy is hierarchically structured and operates through central planning and planning instructions that are obligatory for the socialist enterprises. The volume and distribution of production are decided by central authorities, but these decisions reflect compromises, as they result from bargaining between the respective ministries and the lower levels of management. Under traditional central planning the market is nonexistent rather than "imperfect" (with the exception of personal consumption). Foreign trade is centrally controlled by administrative methods rather than by financial regulators. The producers are isolated from the

world markets, and it is not their task to sell the goods produced by them. The products designed for exports are channeled to foreign trade enterprises that are specialized according to product-types and have monopolies in foreign trade transactions.

Yugoslavia, with its system of self-management, is a unique case. Taken as a whole, the Hungarian economy is also an exception: it is the most decentralized and market-oriented economy in the Council of Mutual Economic Assistance (CMEA – also referred to in the literature as COMECON) as a result of a comprehensive reform implemented in 1968. However, as far as the forest sector is concerned, the role of the market is very limited, even in post-reform Hungary.

The aim of this chapter is to shed some more light on Eastern Europe's foreign trade in forest products by drawing attention to the interrelations that would probably be difficult to formalize in the usual modeling framework.

5.2. Anti-Foreign Trade Bias in the CMEA Countries

This region has a small and decreasing share in world trade of forest products: in 1980 CMEA's share in world imports was 6% and in world exports 9%. These relatively small shares, however, do not correspond to either the level of economic development or to the natural endowments of the region taken as a whole. On the other hand, there are some groups of forest products in the trade in which the USSR and Eastern Europe play an important role. These are three product categories in which the CMEA takes the first or second place in the rank of major exporters: pulpwood, fuelwood, and coniferous logs, which, in fact, have the smallest shares among the commodity groups in world trade. Coniferous sawnwood, perhaps, could be added to this list: the trade flow between the CMEA and Western Europe accounted for 8.3% of world trade. As far as imports are concerned, the CMEA's members do not belong to significant buyers in any of the main product groups analyzed in the IIASA Forest Sector Project.

Research on Eastern European foreign trade has shown that the volume of trade of the centrally planned economies has been lower than it would have been for a market economy at similar levels of economic development, and lower than what would have been warranted by comparative efficiency indicators (van Brabant, 1980). Trade aversion is inherent in central planning and was reinforced by early economic policies.

For historical reasons an autarkical development was chosen for rapid industrialization of the Eastern European countries in the 1950s. Uniform economic systems and very similar economic policies were adopted for countries that differed considerably in size, in their levels of development, and in natural endowments. The primary aim was self-sufficiency on the CMEA level, but there were also efforts made toward autarky on the national level.

The economic management methods by means of central planning were more suitable for inward-looking development than for opening up the

economies. An export-oriented development necessitates the calculation of opportunity costs, and the making of alternative development strategies – methods alien to central planning as practiced in Eastern Europe. In the first decade of socialist foreign trade in Eastern Europe imports were mainly used as a stopgap for temporary deficiencies of domestic production, and exports were needed primarily to finance unavoidable imports; otherwise, foreign trade was regarded as something that involved risk and brought uncertainty. Apparent stability was highly valued in the centrally planned economies and seemed to outweigh the benefits of international specialization.

By the 1960s, however, it had become increasingly recognized that autarkical development in Eastern Europe (excluding the USSR) would lead to a deadlock. The efforts made for import substitution of the small CMEA countries became self-defeating. Growth targets and region-wide shortages necessitated increasing imports from market economies. Then the planners had to face repeated balance-of-trade disequilibria, which were more and more difficult to manage. In the favorable international climate of the late 1960s and early 1970s, the Eastern European countries became engaged much more intensively in world trade. This process, however, soon came to a halt. Owing to the unchanged systemic and institutional factors (the most important of which was the lack of organic links between the home producers and consumers, and the foreign markets) and partly also to the adopted development strategies, the CMEA countries were not able to adjust successfully to the new situation created after the first oil shock. These countries suffered serious trade losses (again, with the exception of the USSR) both in Eastern and Western markets and accumulated a considerable amount of foreign debt. This, in turn, led to reconsideration of foreign trade policies, which involved a forced export push, sharp cuts in imports, and a renewed emphasis on import substitution.

The foreign trade of the forest products of the CMEA countries has to be seen against the background described above.

Taken as a whole, Eastern Europe is rich in forests, but there are a few countries, such as Hungary and Bulgaria, which are rather poor in this respect. This in itself partly explains the weight of forest-related industries in the individual national economies. As far as the development of this sector is concerned, it should be kept in mind that in centrally planned economies all major investments are allocated by the planning authorities. To a considerable extent, then, these investment decisions reflect their preferences and/or the political and economic weight of different industrial sectors. The wood and paper industries in most Eastern European countries did not belong to sectors that enjoyed priority or were influential in industrial policy. In spite of this, remarkable growth rates of output have been achieved in many wood industries during the past decades. On the other hand, there are still region-wide shortages of certain products, and the technological gap between the average Eastern and Western producers has not been diminishing. This, together with the general level of economic development and some cultural and systemic peculiarities, explains the disproportionately low level of consumption of processed forest industry products, pulp and paper in particular.

The overall apparent per capita consumption of wood is not much less in the USSR than in North America. Similarly, Eastern Europe does not lag much behind Western Europe (including northern Europe). However, while in North America the utilization of wood in the form of roundwood is less than 8% of total wood consumption, in the USSR this share is more than 30%, the major part of which is used as fuelwood.

A striking divergence can be observed in paper and paperboard consumption. Per capita consumption in North America is eight times higher than in the USSR. The differences between Western and Eastern Europe are less but are still significant: consumers use twice as much paper in Western than in Eastern Europe. In this case, however, one must be careful with the implicit conclusion. The difference in paper consumption between North America and Western Europe is also rather significant.

In centrally planned economies the production and allocation of forest products are determined annually in the macroeconomic plans. The basic device for making consistent plans is the system of "material balances" [1], which means that on balance sheets, sources (production, contracted imports, inventories, etc.) are confronted with requirements (domestic consumption, contracted exports, reserves, etc.), all in physical units, and are adjusted through rather crude procedures of iteration. In the practice of traditional central planning it is the level of attainable output that determines the final demand. The planners have to solve the problem of the interdependency of material balances. In a modern economy interindustrial relations play an increasingly significant role; thus the use of an input–output technique seems to be more convenient for constructing consistent macroeconomic plans. The input–output tables, however, could not substitute for "material balances" in the centrally planned economies.

The fulfillment of the annual and five-year plans (which is also one of the major success criteria of managers) based on material balances is largely dependent on the stability of their components, including exports and imports. Consequently this planning method implies preference for countries that are willing to make firm longer-term trade commitments, while price sensitivity and flexibility associated with the trade among the market economies does not fit well into the system.

5.3. Trading and Pricing Methods within the CMEA

From the early 1950s the socialist countries of Eastern Europe were induced to conduct the bulk of their trade within the CMEA. The adopted mechanism of the exchange of commodities and of payments and the organizational forms of foreign trade were created on the basis of the exclusion of market forces, of monopoly of foreign trade, inconvertibility, and bilateralism. The essential features of trading systems in most countries have not changed much since then.

The majority of foreign trade decisions concerning intra-CMEA trade flows are taken in quantitative terms. Every five years the representatives of

national planning offices "coordinate plans", i.e., they negotiate about the volumes of products they demand and are ready to supply. Here the "from the achieved level" principle used to apply, i.e., the starting levels of the negotiations were the quantities supplied in the previous period. (This principle is changing now, especially for raw materials.) At this phase of bargaining, constant prices (prices from the previous period) are used in order to make aggregation and calculation of balances easier. It should be emphasized that the CMEA trade agreements are conducted on a strictly bilateral basis.

In the process of negotiations between the ministries of foreign trade attention is paid to the approximation of the bilateral structural balance of "hard" and "soft" goods. Most of the raw materials belong to the first category (i.e., commodities in short supply that could be sold to countries paying with convertible currencies), while "soft" goods cover products that are not competitive on the world market (for example, the majority of machines produced). Most forest products are considered "hard" commodities, as there is a growing discrepancy between the demand of the Eastern European countries and the supply available within the CMEA.

Negotiations become more complicated when exporters insist on having certain products exchanged only for items with similar use values. Examples of this extreme bilateralism in the paper products trade of the smaller CMEA countries could be observed. After the volumes of bilateral trade are determined for five years, the price negotiations and specification of products follow. These negotiations take place annually between the specialized foreign trade enterprises of the CMEA countries.

5.3.1. Price formation

Eastern European countries use world market prices as a starting point in determining prices in their intraregional trade. This means that the trading partners are oriented by prices exogenous to them because the domestic prices of the CMEA countries are fixed administratively, and can be changed only by a decision of the authorized central office. These prices, as a rule, do not reflect scarcity and abundance and play a minor role, if any, in resource allocation [2]. In addition, each CMEA country developed different price-setting principles and exchange rate systems. As a consequence, exchange rates cannot be used to compare the costs of production (the basis for calculating comparative advantages) among the individual CMEA members.

There are several rules in accordance with which world market prices are modified for the intra-CMEA accounting purposes. For many years the CMEA contract prices were fixed for five years and were based on "documented" average world market prices for the preceding five-year period. For example, intra-CMEA trade in 1970–1975 was conducted on the basis of average world market prices in 1965–1969, "cleansed" of monopolistic influences and cyclical fluctuations. The price explosion on the world markets in the mid-1970s led to the alteration of this formula. Starting from 1975, the CMEA

prices follow the world market prices more closely; annual adjustments are being done on the basis of five-year moving averages.

Most of the intra-CMEA financial flows are denominated in transferable rubles. (A small, but increasing share of goods in the intraregional trade is exchanged for convertible currencies.) World market prices, expressed in convertible currencies, are converted into transferable rubles at the official ruble–dollar exchange rate specified by the USSR. Transferable rubles are used mostly for accounting only, as they lack the most important features of international money: they cannot be converted into either other currencies or commodities. This explains why the CMEA trading partners pay particular attention to balancing trade bilaterally among each other even in the short run.

Apart from the principle of using "world market prices of yesterday" there are other factors that bear on actual CMEA price formation. Thus, the effective prices of the same products can differ significantly between the CMEA trade and on the world market. The rule of halving the transportation costs between exporters and importers makes importing from CMEA countries cheaper in many cases than from Western markets at the same distance.

The actual prices for a specific product in most cases reflect mutual concessions given as a result of bilateral negotiations between the foreign trade enterprises. For a nonexpert, commodity groups into which forest products are broken down seem to be rather homogeneous, but in reality there is always space for bargaining about which world price for the product in question should be taken into account. Quality and assortment are price-modifying factors. The outcome of bargaining can also be different if the given countries are exporters and importers of similar products at the same time.

Reaching a consensus on prices is a lengthy and cumbersome procedure. Authorities on the higher levels are involved often as well. It must be noted here that the producers and consumers of the CMEA countries are organizationally isolated from each other (they do not have a say in price negotiations) by the institutions of the foreign trade monopoly and financially by the "price equalization" system. As a rule, producers receive the domestic price of their products regardless of the actual export price. Profits become government revenues, and losses are refunded from the same budget. Prices are equalized in a similar way in the case of imports. This system was abolished in Hungary in 1968.

5.3.2. Trade among the CMEA countries

Intra-CMEA trade is asymmetrical in many respects. The output, consumption, and trade of the small CMEA members are dwarfed by the respective data of the USSR. The USSR, the main supplier of all forest products, has intensive trade relations with its CMEA partners while the small CMEA countries do not trade much with each other. This radial pattern is a typical feature of intra-CMEA trade, which pattern has been gradually strengthened during the past two decades. In the early 1960s, Soviet forest product exports were less

decisive in the CMEA trade; the smaller Eastern European countries relied more on each other's shipments [3]. Romania's role as a leading exporter of raw and semi-processed materials was especially notable. However, because of chronic shortages of convertible currencies and of the inadequate CMEA trade mechanism, the small Eastern European countries shifted the larger share of their exports to Western Europe. In some countries, an increasing share of raw materials was processed in domestic woodworking industries. Trade in paper products among the small CMEA countries is much restricted to "compensation in kind", and it is carefully observed that mutual deliveries be equal. Soviet exports are shown in *Table 5.1* in quantities highlighting the major intra-CMEA flows. All the CMEA countries buy forest products from

Table 5.1. Soviet exports of forest products (m^3) – total and to Eastern European countries (*FAO Yearbooks*).

Product/ destination	*1968*	*1973*	*1976*	*1979*	*1981*
Sawn + veneer logs:					
Total	5908	9800	9095	7730	6198
Bulgaria	283	319	281	283	
Hungary	219	302	192		483
Sawnwood (coniferous):					
Total	7925	9209	8550	7628	6925
Bulgaria	170	182	196		
GDR	1224	1357	1249	1237	1300
Hungary	879	861	781	765	664
Poland	263	181	195		
Pulp:					
Total	426[a]	520	632	680	100
GDR	50.5[a]	72	80	64	108
Hungary	69.2[a]	86	84		726
Poland	31.1[a]	90	125	96	182
Paper + paperboard:					
Total		568	670	667	17
Czechoslovakia		85	85		
GDR		129	168	173	
Hungary		74	120	100	
Fiberboard:					
Total	83	173	271	313	319
GDR	12	37	60	46	
Poland	5	60	91	83	243
Particleboard:					
Total	80.9	168	271	267	362
GDR	22	50	101	94	
Poland	36.1	66	89	74	116
Plywood:					
Total	243.7	316	319	339[b]	
GDR	20.8	35	51	49	
Poland	13	45	51	43	

[a] 1969 data.
[b] 1977 data.

the USSR; the degree of dependency, however, differs. This is largely due to differences in raw material resources. Bulgaria, East Germany, and Hungary are heavily dependent on the full range of forest products imports from the USSR. The self-sufficiency of Czechoslovakia and Romania has reached a rather high level, while Poland takes an intermediate position.

The share of wood and paper products in total Soviet exports to CMEA countries is around 4%, somewhat lower than that in total Soviet exports worldwide. Larger shares of roundwood, coniferous sawnwood, and plywood are sold to the developed market economies, while Eastern Europe is the chief buyer of fiberboard, particleboard, paper, and newsprint, i.e., of the more processed commodities.

During the period under examination (1968–1981), no large or unexpected changes occurred either in the commodity composition or in the geographical distribution of trade within the CMEA. The fastest rate of expansion in trade has been in particleboard and fiberboard, the principal importers being Poland and East Germany. Soviet exports of pulp to Eastern Europe almost doubled during the 1970s. The traditional buyers of pulp are East Germany, Hungary, and Poland; Poland's share has increased considerably compared with that in the 1960s. Paper products trade grew at around the average rates of total forest products. Exports of roundwood and sawnwood started to decline after 1975.

Until 1978 a unique feature of intra-CMEA trade was stability, i.e., a steady growth of export deliveries, almost without fluctuations. This was in sharp contrast with what the other trading regions experienced during the same period, particularly in the mid-1970s, when the volume of exports and imports on Western markets declined steeply while the intra-CMEA trade continued to develop at relatively high growth rates in accordance with their overall economic activities. However, the possibility of isolating the centrally planned economies from worldwide disturbances proved to be a short-lived illusion.

Eastern European countries (for which buying raw materials from the USSR was rather advantageous by most criteria), had to accept the fact that the USSR is neither able nor willing to supply raw materials either in ever-increasing quantities or on the terms previously applied. Also in the case of forest sector products it has become evident that the barriers to Soviet production, its pressing internal demand, and its need to increase its exports for convertible currencies will reduce the availability of additional exports to CMEA countries.

The CMEA importing countries can expect future increases in the deliveries of some important forest products only to the extent that they share in the costs of development. An example of this kind of joint project is the Ust-Ilimsk wood-processing complex. Approximately 40% of this investment was met by the small CMEA countries (with the exception of Czechoslovakia) in the form of machinery and equipment (with nonnegligible hard-currency imports content). This contribution is to be paid back with the pulp mill's output over a period of twelve years.

5.4. East–West Trade

In this section socialist countries' trade with the developed industrial countries for the years 1968 to 1981 will be analyzed. As generalizations on East–West trade would be misleading if "East" were treated as an homogeneous entity, Soviet trade and that of the other six Eastern European countries will be discussed separately.

5.4.1. Soviet trade with the West

Indicators such as the ratio between production and exports of timber products to the West or total exports unduly belittle the significance of these exports. Actually, coniferous logs and sawnwood are among the eight most important Soviet hard-currency exportables. It is in the USSR's interest to stabilize the exports of these valuable earners. However, several factors (some of which have been mentioned above) have counteracted efforts to maintain at least the mid-1970s level of exports. The forests in the western part of the USSR, which were once rich, have been depleted to the extent that any future expansion of exports of this sector can be expected only if production shifts eastward to the Siberian parts. The investment requirements in this region are enormous, as they necessarily include the development of infrastructure and transportation. It is likely that the forest sector will be eclipsed in the coming decades: this assumption is based on long-term Soviet plans for investment allocation.

Rapidly increasing internal demand and the export obligations of the USSR to its CMEA partners put additional limits on the expansion of exports to the West.

As far as Western demand is concerned, the evidence of the last half decade suggests that it did not significantly stimulate shipments of additional quantities of Soviet timber products. This is especially true for the EEC, which is the major Western export market for Soviet sawnwood. On the other hand, roundwood exports to Japan and Finland have become more intensive.

The market allocation of Soviet exports has shown a remarkable stability. A significant part of these exports is based on long-term bilateral agreements, and the USSR shows a strong preference for counter-purchase agreements. It is ready to pay with forest products in exchange for machinery, equipment, and consumer goods, an arrangement which contributes to the expansion and modernization of the forest sector.

5.4.2. Soviet–Japanese trade

The geographical location of these two countries make them natural trading partners, especially in the case of commodities such as forest products since their competitiveness is very sensitive to transportation costs. Exports of

forest products to Japan are of primary importance for the USSR, as raw wood materials constitute the second largest group in its export earnings.

The significance of Soviet exports of coniferous sawnlogs to Japan is well illustrated by two figures: this flow represents 21% of world trade in this commodity category, and the Japanese market absorbs 78% of Soviet exports of sawnlogs. This share has not declined over the last ten years and, more important, it is the only market whose competitiveness did not diminish because of the eastward shift of Soviet sawnlogs production. The stability and intensity of the Soviet–Japanese log and pulpwood trade is strengthened by long-term agreements concluded by the two countries since the second half of the 1960s. The Japanese participated in the exploitation of the forests in Siberia by sending logging equipment, vehicles, and other machinery and consumer goods in exchange for Soviet timber, wood chips, and pulps.

Japanese dependency on Soviet shipments is high in one product: 90% of the country's imports of pulpwood are delivered by the USSR. On the other hand, there is strong competition on the Japanese coniferous roundwood market between the USA, the Southeast Asian countries, the USSR, and Japan. There are significant and frequent short-term fluctuations in market shares, depending on the conditions offered by the supplier. This creates special problems for the USSR, the price mechanism of which is centralized and inflexible to short-term changes. Its market share has been especially vulnerable to competition from American logs (Japan Forest Technical Association, 1983).

The Japanese authorities protect both producers and consumers in an effective way. With the aim of avoiding the harmful effects of fluctuations, measures to stabilize the supply and prices of wood were taken in the mid-1970s. Under the aegis of the Forestry Agency, an institution was given the task of keeping a close eye on wood markets and on the main foreign exporters. In addition to making projections, its activities also include the stockpiling and the storage of lumber and plywood in anticipation of unusual rises in wood prices and then releasing them when these are rapidly increasing.

5.4.3. Soviet–Finnish trade

Finland plays a unique role in Soviet trade with market economies. Geographical closeness and good, equable political relations (which are often cited as an example between countries with different socioeconomic systems) contribute to the high intensity of bilateral trade links. Moreover, trade between the USSR and Finland is facilitated by the latter's adaptation to Soviet trading mechanisms and preferences. Exchange of goods between the two countries is based on strict bilateralism and payments in clearing accounts. The five-year agreements, in which exports and imports are *ex-ante* balanced, make the planners' task easier and the avoidance of using hard currencies in times of chronic shortages is obviously advantageous for the USSR. Looking at the structure of overall trade there can also be no doubt about the benefits from this trade for Finland. Commercial policies aiming at developing

Soviet–Finnish trade had a positive trade-creating effect, but one may also venture the hypothesis of the existence of some trade diversion.

Soviet–Finnish trade in forest products is mainly intrasectoral. Finland is the only country for which the USSR also acts as an export market for wood products.

Finland's imports of forest products were (until 1980) rather concentrated: roundwood imports came almost exclusively from he USSR. Soviet exports of pulpwood have almost tripled during the past decade and represent the world's largest trade flow between two countries in this product category. It is interesting to note that Finland itself belongs to the major exporters of pulpwood, the largest part of which is directed to the Swedish market, although the amount varies from year to year.

In order of importance of Soviet export items, pulpwood is followed by coniferous logs. Around 10% of Soviet exports of logs goes to Finland, and this share did not change much during the 1970s. It is remarkable that, in contrast to the sharp fluctuations in Finnish production and trade, imports from the USSR developed relatively evenly, obviously due to long-term trade agreements.

Sawnwood plays an important role in both countries' exports. In this product category there is no mutual trade; rather, the two countries compete with each other on the Western European market. Trade in wood-based panels between Finland and the USSR is not significant either.

Finland enjoys an ever-increasing demand for its pulp and paper products in the USSR. In 1981, 11% of Finnish pulp exports and 23% of paper and paperboard exports were directed to that country. The USSR's share of Finnish paper exports has increased considerably, partly a result of Finland's decreasing competitiveness on the OECD markets.

5.4.4. Soviet–Western European trade

While Soviet exports to Japan and Finland are dominated by logs and pulpwood, coniferous sawnwood is of primary importance in its deliveries to Western Europe. With reference to Western Europe, we concentrate here on the four major importers: the United Kingdom, West Germany, Italy, and France. As evidence of the past fifteen years shows, Western Europe's dependency on Soviet sawnwood has diminished. For example, while in 1970 more than one third of the United Kingdom's imports were supplied by the USSR, this share had declined to around 10% by 1980. Similar tendencies can be observed in Soviet trade with France. However, in those countries where imports from the USSR were initially less significant, the Soviet share remained either the same (Italy) or slightly increased (West Germany).

The evolution of demand for sawn softwood in the past decade was largely determined by cyclical movements in economic growth, and even more by the slow growth or decline in the building sector in most of Western Europe. It was accompanied by an increasing substitution for sawnwood by wood-based panels. The self-sufficiency of Western Europe on the regional level has

increased, and competition became keener because of the strong expansion of price-competitive Canadian exports. Sweden and Finland, the traditional main exporters to Western Europe, made efforts not to lose ground in this market. Thus, the USSR has less stability in its Western European exports than in its exports to its other trading partners. This is not to say that the shipments and prices of Soviet forest products do not influence the market situation in Western Europe. Forward sales and quotations during the year are good indicators of supply and demand conditions and of confidence in markets. The attention that is paid to the USSR's offers is still great. Prices in these Soviet offers usually have the effect of clarifying the market situation (although, as in 1981, the contrary can also happen; see UN ECE, 1982).

It is often asked how a state trading country, in this case the Soviet Union, uses its potential market power, and how it influences the prices on the international markets. Unfortunately, we can answer this question only on the basis of very scant information. Commodity experts agree that the Soviet Union is usually a "price follower" on its main export markets, and this is true also for its forest products. Computations made by Wolf (1982) also show that even in those markets where the Soviet potential market power is great, the Soviet Union does not actively lead pricing developments. Most observers agree that Soviet prices are usually lower than those of its competitors (in many cases, this is due to quality differences). Another feature of Soviet export prices is their rather high variability.

5.4.5. Trade between Eastern and Western Europe

Eastern Europe's exports to the West appear small compared to the quantities delivered by the Soviet Union to its Western partners. The shares of the Eastern European exports of logs, sawnwood, and pulpwood on the EEC and Austrian markets are not negligible. While Eastern Europe is an exporter of mainly raw and semi-processed materials, pulp and higher-quality paper products dominate its imports from the West.

It is partly due to this pattern of trade that Eastern Europe's exports of forest products have been suffering unduly from the prolonged recession in the West. Indeed, only one country, Czechoslovakia, was able to increase its exports during the 1970s. All the other five countries experienced, although to different degrees, a decline in their share of the Western market.

As a result of the balance-of-payment difficulties in the Eastern European countries in the second half of the 1970s, direct incentives to export and severe restrictions on imports were introduced. This meant moving even further away from trade liberalization, and led to decreasing efficiency and increasing shortages in those countries. Efforts toward self-sufficiency became more pronounced. It is difficult to find policymakers in Eastern Europe who would regard imports as a cost-reducing alternative to production.

Pressure on increasing exports in order to improve the balance-of-payments disequilibria was so strong that considerations about their profitability were pushed into the background. This logically led to terms-of-trade

losses. Eastern European export prices are known to be usually lower than those of their Western competitors, partly due to the factors mentioned above. However, in many cases this can also be explained by systemic factors such as poorer and uneven quality of products, delays in deliveries, inexperience in sales techniques, etc.

Eastern Europe's exports suffer from the growing protectionism concerning certain forest products in the West. Trade between Eastern Europe and the EEC is impeded by tariffs and quotas, and its wood-based panel exports are especially vulnerable in this respect.

Looking at the major bilateral trade flows in East–West trade, it is apparent that the category "West", from the point of view of important export markets for wood products, includes different countries for the USSR from those for Eastern Europe. While the USSR's main trading partners are Japan and Finland, followed by a few EEC countries, the bulk of Eastern European exports is directed to the EEC and Austria, and in recent years to Scandinavia. This means that in the case of the six smaller CMEA countries, East–West trade is almost exclusively intra-European trade. The proportions of this pattern of trade should be kept in mind: in the intra-European East–West forest products trade, 60% of exports come from the USSR, 20% from Czechoslovakia, and 12% from Poland; the remaining countries' shares are well below 10% each. There was one important change in this rank compared with the late 1960s: the dramatic downturn of Romania's exports. In fact, in the period under examination it was only Czechoslovakia that showed a significant and steady expansion of log and sawnwood exports to Western Europe. This was the result of a deliberate economic policy that recognized and extracted the hard-currency-earning abilities of the forest sector.

Czechoslovakia was the world's third largest exporter of coniferous logs in 1981, and the exported volume reached that of Canada in that year. More than half of Czechoslovakia's exports went to neighboring Austria and covered half of Austria's total imports of logs. From the point of view of distance, this deal must have been advantageous for both parties, probably more for Austria because, according to the experts, export prices of Czechoslovak roundwood are very attractive. Although we have strong reservations about using unit values as proxies for prices, there is no choice: the available statistics provide only this information to verify the above statement. Indeed, in coniferous logs Czechoslovak export unit values are the lowest among those of major exporters, while Austria's import unit values are below the European average. The high intensity of trade in forest products between these two countries is a relatively new phenomenon. In 1970 Austria was a much more modest importer of forest products; Czechoslovakia's exports were mainly directed to the French and West German markets. Similar changes took place in the geographical distribution of Czechoslovak exports of pulpwood: Austria's share has grown considerably at the expense of that of West Germany. Czechoslovakia's pulpwood exports grew rapidly from 1972 onward, but while in the export of coniferous logs it has no real competition with other socialist countries (excluding the USSR), in the case of pulpwood Poland, Hungary, and Romania are also eager to increase their exports to Western markets.

(Hungary exports a nonconiferous species of logs, incidentally.) As the low value-to-weight of pulpwood can bear only relatively small transportation costs, Eastern European exports are aimed at almost the same markets. When the demand for pulpwood is sluggish (as happened many times in the recession years), this competition seriously hits the Eastern European countries, especially as they do not collude or make market-sharing arrangements. Besides the traditional West German and Austrian markets, where all Eastern Europe's exporters can be found, Poland has a new outlet for pulpwood: because of its geographical location, the country could achieve a considerable increase in exports to Sweden.

In 1970 coniferous sawnwood was among the leading export items of the three eastern European exporters. Since then, Romania, the major exporter, withdrew. Poland's production and exports are in decline. Only Czechoslovakia's exports show an uninterrupted growth. Again, this latter development was accompanied by changes in the spatial structure of trade. In 1970 Austria's share was only 2%, while in the 1980s more than a quarter of Czechoslovak sawnwood exports were directed there. The relative importance of traditional buyers (the Netherlands, the United Kingdom, and West Germany) is decreasing while purchases by Italy are increasing.

Eastern European exports of wood-based panels showed a slight upward trend during the past decade, with Poland and Romania playing the main roles. Poland, the second largest producer in Europe after the USSR, exports around 30% of its production, mainly to the United Kingdom, West Germany and, more recently, the United States. The only important exporter of plywood and particleboard in Eastern Europe is Romania (the volume of its particleboard exports is the same as that of Soviet exports).

Eastern Europe's role in the trade of pulp and paper products is so small that FAO yearbooks do not publish data on the direction of their exports. There is evidence from other sources, however, that one country – Czechoslovakia – is also trying to penetrate Western markets with these products, above all, Austria and West Germany. East Germany is the other CMEA country with a relatively developed paper industry and a large amount of paper products in its exports; however, the trade data are either not available or are too uncertain to permit any conclusions. The recent high growth rates of Czechoslovak exports of pulp are the result of counter-purchase agreements.

At the aggregate level, Eastern Europe is not a significant and prosperous market for Western exports of forest products. In most of these countries the aim of investments in the wood-based panels and paper industries was import substitution, i.e., a decreasing dependency on Western imports. The bottleneck-widening function of imports has already been mentioned. Special high-quality papers are still obtainable only from Western sources. Nevertheless, even justified applications for import licenses can be rejected if the current state of the balance of payments requires it. In such circumstances it is hard to imagine that a foreign supplier could outbid an Eastern European producer, however unprofitable the latter's production was in the real microeconomic sense.

East Germany and Hungary, however, could probably not do without Western imports of pulp and paper. For East Germany, lack of reliable statistical data allows only an estimate, according to which around one third of its total imports of pulp comes from the Nordic countries. Hungary is also a regular buyer of pulp from Sweden and Finland (especially when better quality is required). In the case of trade with Finland, the advantages of stable commercial relations and mutual trust should be emphasized. The West's share in Hungary's imports of paper is not negligible either. Hungary is buying paper in small quantities from all over Europe, the main suppliers being Austria, Finland, and West Germany.

5.5. Future Trends

First, much will depend on the regional development of the USSR and the reforestation and more careful treatment of the most depleted Eastern European forests. (For a comprehensive analysis of Soviet regional development, see Jensen and Wright, 1983.) Around three quarters of the USSR's timber supply is in Siberia, most parts of which are remote and inhospitable. To gain access to this timber, heavy capital investments will be required in transport and infrastructure as well as in the forest sector itself. Demand for investment resources is unconstrained owing to systemic factors inherent in central planning. These resources are allocated by central authorities between competing sectors and, moreover, competing regions. The forest industries have not been a high-priority sector, and there is not much ground for believing that it will become so. On the other hand, the development of this sector cannot be neglected, not least because of its export potential. Taken together, the regional shifts and the need for selling wood products for hard currency make it very probable that Japan's role as an importer of Soviet wood products will increase in the future; the more so because the USSR cannot realize its ambitious development programs in the Soviet Far East without buying advanced technology and involving convertible currency credits. Japan has already expressed its interest in the development of the Soviet Far East raw material sector. One should not, however, be too optimistic about these plans for closer cooperation – latent political conflicts and the Japanese fear of being too dependent on any Soviet raw materials act as counter-factors.

Because of inertia, tradition, and the Soviet preference for long-term trade agreements, it is fairly safe to presume that Finland's role as a trading partner in forest products will not diminish either. The Soviet wood-processing, pulp, and paper industries will continue to develop at higher growth rates than roundwood production, but they are unlikely to match the technological level and product quality of their counterparts in the developed market economies. Thus, slow changes can be expected in the product mix of exports and imports.

It is difficult to predict development in Soviet trade relations with Western Europe. In the sawnwood and roundwood markets, the USSR faces a

more complex situation with a great number of potential competitors. In the case of processed goods, EEC protective measures are likely to constitute a significant barrier.

Soviet shipments of forest products to Eastern Europe will become increasingly less separable from Soviet trade with the rest of the world. The CMEA partners will have to share – at least partially – the costs of development if they wish to obtain increased supplies in certain forest products. If the regional shifts described above take place, then this will probably affect transportation costs seriously. The small Eastern European countries, however, would be unable to make large shifts in their purchases to sources outside the region. Therefore, in order to maintain a degree of stability within the CMEA, the USSR will rather stabilize its exports of raw materials.

Notes

[1] The more centralized an economy is, the heavier it relies on allocation through "material balances". For example, in the USSR the 1981 plan was based on more than 2000 balances prepared by the Gosplan (Planning Office). The number of balances constructed centrally has increased compared with the early 1970s. The philosophy that lies behind this recentralization can be illustrated by the opinion of a Soviet economist: "Resources are safer when they are centralized" (Kushnirsky, 1982). The use of material balances in the small CMEA countries is less comprehensive than in the USSR; but in the case of timber and paper products, given their "strategic importance", it is used in most countries.

[2] The principle of socialist pricing was that prices should be set centrally, should cover (average) costs, and should be marked up by a normative profit determined by the center. These prices were then modified by subsidies and taxes in an elaborate way. The inadequacy of this kind of price formation was recognized in most of the Eastern European countries and led to different "price reforms" during the past two decades. In spite of these efforts, administrative price formation in most of the CMEA countries prevails and prices are not much less autarkic.

Hungary, where the system of management differs markedly from that of other Eastern European economies, is also an exception in this case. Price formation in this country is more decentralized and, as a result of a comprehensive price reform in 1980, prices are in closer connection with the world market prices. Exchange rates also started to function more actively. However, there is still much to be done in the whole system to achieve an efficiently functioning price system.

[3] In the case of Hungary in 1960, 42.7% of total forest product imports came from the USSR, as compared with 75.9% in 1975. Romania's share was 17.3% in 1960, which had declined to 2.8% in 1975. At the same time, 61% of Hungarian exports went to East Germany in 1960, while in 1975 they amounted to only 4.1%.

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CHAPTER 6

Finland: Its Forest Industries in a Global Context

Risto Seppälä

6.1. Introduction

Finland lies betwen the 60th and 70th parallels, which corresponds approximately to the location of Alaska and the northern part of Siberia. However, the country enjoys a warmer climate than most other territories within the same latitudes, mainly due to the Gulf Stream and to southwesterly winds.

Finland is not rich in mineral resources, and it has no coal, oil, or natural gas deposits. Therefore, its economy is very dependent on foreign trade. Nearly one third of industrial production is exported.

Forests are Finland's most important natural resource, and two thirds of the country is covered by them. Finland is more dependent on forestry and the forest industry than any other developed country in the world. The market value of the forest sector (forestry and the forest industry) amounts to more than 10% of the GDP. In the early 1950s about 90% of Finland's exports were derived from wood-based industries. At present, the share is still nearly 40%. In addition, the growth of the forest industry has stimulated the manufacture of wood-processing machinery and equipment so that Finland is one of the leading nations in this field.

The three main tree species that have commercial value are Scots pine, Norway spruce, and birch, which is represented by two species. Of the growing stock, 45% is pine, 37% spruce, and 15% birch. The long and strong fiber of pine and spruce is in particular demand in the Finnish pulp and paper industries. Larger sizes of the slow-growing, durable coniferous timber are used in the sawmill industries, and spruce in the plywood industry. The principal use of birch is in plywood manufacture, but large amounts of smaller-sized birch are also used by the chemical pulp industry.

The annual increment of growth of Finnish forests amounts to 67 million m^3, including bark. Since the mid-1960s the actual drain has been less than the allowable one; in the 1980s the difference has been, on average, close to 10 million m^3 per annum, or about 15% of the allowable drain.

Finland's forests belong mainly to private, nonindustrial owners, whose share of the total forest area is 64%. The state owns 24%, the forest industry companies 8%, and others 4%. Among private owners, farmers own about 60% of the forest area, but their share has decreased considerably since the 1960s.

6.2. The Wood Industry

Possibly the first wooden products to be exported from Finland were the handles of longbows, fashioned out of yew wood in Åland during the Middle Ages. Industrial wood processing proper began in Finland in the 1530s, when the first water-driven sawmill was built. In the seventeenth century wood was used for making tar, and, for a while, Finland was the most important tar exporter in the world.

More advanced mechanical processing of wood began with the manufacturing of reels and spokes in the 1870s. The manufacture of wood panels began in 1912, when the first plywood factory was erected.

Sawing began to develop into a major industry in the early 1860s with the arrival of the steam-driven sawmill. Before this, mercantilist opinion had erected formidable barriers to the expansion of the industry. The establishment of sawmills and the acquisition of raw materials were restricted, production quotas were set for mills, and tariffs had to be paid on exported timber.

World economic trends were favorable towards Finnish entrepreneurs at a time when the modern sawmill industry was taking shape. As if by design, a final flourishing of the tar industry allowed the amassing of capital for investment in the new industry. The Industrial Revolution brought in its wake a strong demand for timber products. With regard to the export of timber the most important developments were the end of Canada's favored-nation position in Britain and the removal of the timber tariff in the British market in the 1860s. Finland had already penetrated the Russian timber market in the 1840s, protected by a tariff advantage, though in the mid-1880s tariff regulations in Russia were to be altered in a direction highly disadvantageous to Finland.

After the arrival of the steam-driven sawmill, development was rapid. Between 1860 and 1900 the production of the sawmill industry increased tenfold and nearly doubled between 1900 and 1914. Most of this was exported. Expansion of the sawmill industry also provided a boost to the infant paper industry by creating a reserve of capital and by developing the necessary channels for timber harvesting.

It should be stressed that, unlike in many other peripheral economies, in Finland the forest industries were established mainly by domestic entrepreneurs. Thus, the birth of the industry involved practically no colonial features. Income stayed at home, providing investment opportunities for

other sectors. The scattered farm woodland ownership distributed the benefits of wood production widely and promoted rural development by giving both income and employment.

The outbreak of World War I caused difficulties for the Finnish forest industries, and the closing of the Baltic Sea prevented the export of sawn goods to Britain. After the war, however, connections with the West were quickly reestablished. Not only was timber scarce in Western markets, but the Russian sawmill industry, which had become a strong competitor to the Scandinavian and Finnish industries, was temporarily excluded from the market.

The 1920s were a decade of unparalleled growth for the Finnish sawmill industry, and during that time numerous small and medium-size mills were set up. The industry's exports overtook those of Sweden, and in 1927 achieved a production record that was broken only in 1979.

The depression, following close on the heels of the years of economic boom, struck a severe blow to the industry at the beginning of the 1930s, and many weaker operations collapsed altogether. Nevertheless, the sawmill industry as a whole revived relatively quickly, though production since the 1930s has crept up only very slowly. Not until the mid-1970s was there a rapid expansion in capacity, and in 1980 a record sawing volume of 10.2 million m^3 was achieved. The volume of production has now dropped and the industry is facing overcapacity due to poor competitiveness and concern about the sufficiency of high-quality pine logs.

6.3. The Pulp and Paper Industry

In the seventeenth century both the first printing press and the first paper mills were established in Finland. The first paper machines used rags and straw as raw materials, but their scarcity and expense limited manufacture. Processes for the mechanical and chemical defibration of wood developed in the mid-nineteenth century removed this bottleneck. Since the initial pulps – groundwood and sulfite pulp – were manufactured from spruce, the wood-based pulp industry became established in regions where the spruce tree flourished. Finland fell within the spruce zone, along with the other Nordic countries. Its first groundwood mills were constructed in the 1860s, and the first sulfite pulp mills the following decade.

The initial growth of the Finnish pulp and paper industry was encouraged by the nearby Russian market. Free access to this provided a spur to development until the mid-1880s, when there was an increase in protectionist sentiments in Russia. To facilitate the search for new markets in the West the Finnish paper industry quickly established joint sales organizations, by which it was also able to preserve its exports to Eastern Europe's markets. These organizations, now known as sales associations, still have a distinct role. They will therefore be described in more detail later in this chapter.

While the outbreak of World War I struck a severe blow to the sawmill industry, the paper industry grew rapidly with Russia's demand for its

products. In many cases the depression in the sawmill industry led to mergers with the thriving paper industry, spurring the formation of large forest industry concerns. Then came the Russian Revolution to change the situation once again. Exports of the paper industry to Eastern Europe, which had accounted for 80% of production, ceased completely. The Finnish paper industry doggedly set out to capture new markets. The formation of sales associations assisted this undertaking, and by 1925 production had already surpassed its wartime peak.

During the economic crisis of the early 1930s, through good organization and new technology, the Finnish paper industry managed continually to conquer new markets. Between 1920 and 1938 the value added by manufacture more than tripled and, with Canada and Sweden, Finland rose to become a leading exporter of pulp and paper products.

Although World War II broke this brisk pace of development, the industry as a whole was able to maintain a moderate level of capacity utilization. The war also dealt a severe blow to the paper industry, however, as almost 20 pulp and paper mills were lost with the ceded territory in the east.

After the war international trade picked up faster than expected. By 1948 the production of the Finnish pulp and paper industry had exceeded the prewar level. In addition to the traditional industry a start was made on the manufacture of higher-value-added articles of pulp, paper, and paperboard.

The world economy embarked on a period of vigorous expansion in the mid-1950s, carrying along with it the Finnish chemical forest industry. It was seen as the task of the industry to acquire income and capital to finance increased imports and diversification of the nation's industrial structure. A massive wave of investment in the Finnish pulp and paper industry began in the early 1960s, and the real value added by manufacture more than doubled during the decade.

This fast growth continued until 1974, but the years after the first oil crisis meant a substantial decrease in production and exports. It was only in 1979 that the 1974 level of total pulp and paper production was exceeded.

During the first half of the 1980s production increased considerably in printing and writing paper – especially in fine paper, and moderately in mechanical pulp and newsprint, and decreased in sulfite pulp. Massive investments in 1980–1985 have now so exhausted the financial resources of the pulp and paper industries that only a very modest capacity increase can be expected during the latter half of the 1980s.

6.4. The Structure of Exports

As can be seen from *Figure 6.1*, there has been a notable change in the structure of the exports of the Finnish forest industries in recent decades. Paper and paperboard products have continuously increased their share, while pulp has lost its position. Exports of sawnwood have fluctuated strongly, and their share has a decreasing trend.

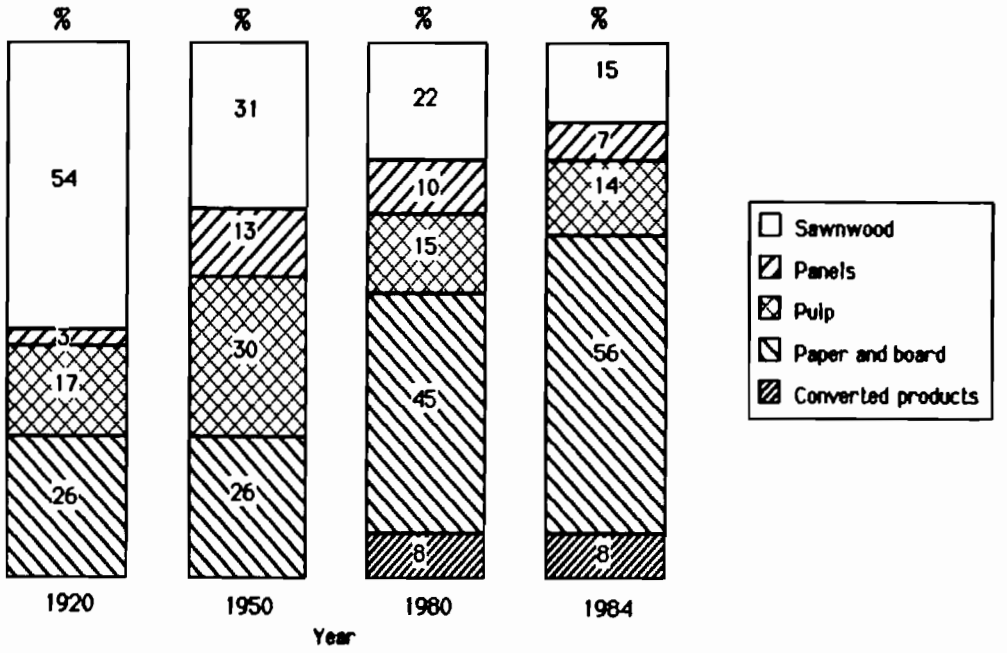

Figure 6.1. The value of exports of the Finnish forest industry by main product groups in 1920, 1950, 1980, and 1984 (*Export Statistics*, various years).

The global forest industry is very home-market oriented. About 80% of world production is directed to domestic markets. Consequently, Finland's share in global production is not very high. In 1984, for example, it was 2.4% in coniferous sawnwood and 3.9% in paper and paperboard (*Table 6.1*). The picture changes dramatically when we look at international trade: Finland is one of the leading exporters of forest products. In coniferous sawnwood its exports of the world's imports were 6.9% and in paper and paperboard the share was 15.4% in 1984. In Europe (excluding the USSR) the shares were even higher: in sawnwood 13.4%, and in paper and board 20%, of which newsprint had a 31.5% share. As a paper exporter Finland ranks second after Canada, whose exports go mainly to the United States.

However, if we look at the exports of all forest industry products, Finland is seen to be losing its relative position over time. In the early 1960s its share of world exports was more than 13%, but in the mid-1980s this had dropped to 9%. This development may not look favorable but, in fact, the picture is not as bad as it seems. Due to the shortage of wood, wood-intensive basic production (sawnwood, panels, and pulp) has lost its share, as can be seen in *Figure 6.1*. In place thereof, high-yield paper products have captured markets. Increasing amounts of pulp have been refined into paper products in domestic mills. The share of market pulp from the total pulp production was 45% in 1960. In the mid-1980s it accounted for only 20%. Both in Canada and in Sweden the corresponding share is still 35%. Consequently, Finland became the world's leading exporter of printing and writing papers, of household and

Table 6.1. Finland's share (%) of the world's forest industries in 1984 (FAO, 1986).

	Production		*Trade*	
Product	*World*	*Europe*[a]	*World*	*Europe*[a]
Coniferous sawnwood	2.4	11.8	6.9	13.4
Plywood	1.3	18.7	6.7	13.3
Particleboard	1.2	2.4	2.8	3.5
Wood pulp, total	5.9	23.8	7.3	10.3
of which, chemical	4.9	22.0	7.5	11.4
Paper + board, total	3.9	13.2	15.4	20.0
Newsprint	6.5	27.2	12.3	31.5
Printing + writing paper	6.1	16.5	25.6	26.2

[a]Excluding the USSR.

sanitary papers as well as of special industrial papers. Its competitors have concentrated more on relatively low-yield standard products, such as pulp and newsprint as well as wrapping and packaging paper and board.

As for export regions, Western Europe is by far the most important area, comprising two thirds of the export value (*Figure 6.2*). The United Kingdom and West Germany are the main importers of Finnish forest products. The USSR comes next, and all other countries account for less than 10% each.

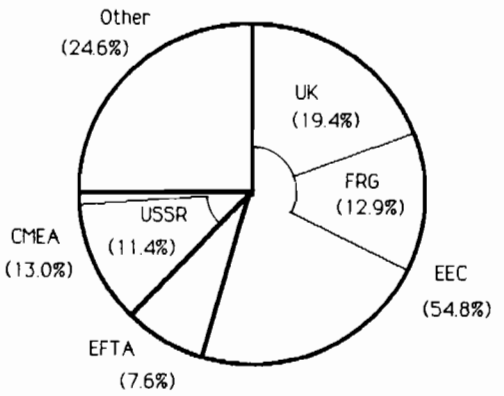

Figure 6.2. Finland's forest industry exports by regions and countries in 1984 (*Export Statistics*, various years).

Finland's forest industry trade network is well-established and therefore quite stable. In the long run, however, substantial changes have taken place in the regional structure of exports. The range of export markets has become larger, along with an increased share in refined production. In particular, the dominance of the United Kingdom has diminished. Although it is still the principal single market outlet, its share has decreased from 29% in 1960 to 19% in 1984.

6.5. Marketing Channels

6.5.1. The birth of sales associations

Finland's forest industry is mostly privately owned, but companies work in close cooperation in the marketing of their exports. Pulp and paper products have been sold mainly through joint sales organizations.

The present major organizations originated during the last year of World War I, when the principal market area, Russia, was almost totally closed to the Finnish pulp and paper industries. New outlets had to be sought and these were found in Western markets, where other producing countries already had an established position. In these circumstances the Finnish paper producers decided to join forces, and they founded the Finnish Paper Mills Association, later simply called Finnpap, in 1918. Its predecessor, the Finnish Paper Association, had been established in 1892, but this was directed only toward Russian markets.

Also in 1918, the Finnish pulp producers founded their own organization, the Finnish Pulp Association (Finncell) to sell jointly on home and export markets. Like Finnpap, it had a predecessor, the Finnish Woodpulp Union, which was founded in 1892. This latter organization also took care of the sales of paperboard until 1943, when the Finnish Board Mills Association (Finnboard) was established. The fourth member of the family, the Finnish Paper and Board Converter's Association (Converta) was established in 1944.

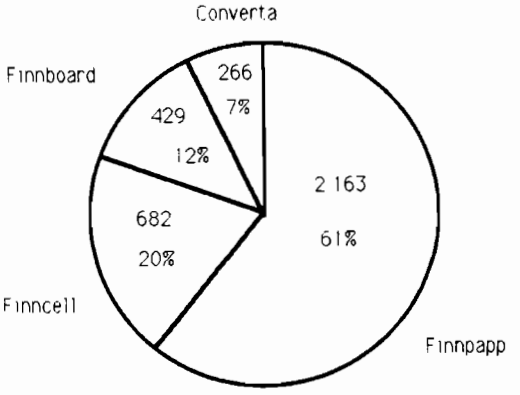

Figure 6.3. Sales ($ million) and percentile shares of the marketing associations of the Finnish chemical forest industry in 1984 (Finnpap, 1984).

These voluntary joint marketing organizations are unique in the world's forest industry. Their total sales in 1984 were US $3.54 billion (*Figure 6.3*). All four associations are among the world's largest sellers of their respective products. In 1984 export deliveries amounted to 4.3 million tons for Finnpap, 1.5 million tons for Finncell, 0.8 million tons for Finnboard, and 0.3 million tons for Converta. These export volumes are, on average, around 10% of global

imports. In addition, the sales associations are the largest sellers on the domestic markets.

6.5.2. Advantages of sales associations

The sales associations of the pulp and paper industry have several advantages compared with a situation where each company markets its production by itself. The most important of these are:

(1) Fewer resources are required compared with the needs of numerous individual marketing organizations. The sales network easily covers the whole world, and overlapping activities can thus be avoided.
(2) The existence of the associations has taught Finnish companies to collaborate. As a result, the exchange of technical information among engineers is common, and the companies jointly own a major research laboratory.
(3) The sales associations offer their member companies many valuable services at a low price. These include warehousing using local stocks, taking care of orders handling, invoicing and other export routines – and also financing. This means that companies receive payment from a sales association immediately upon delivery regardless of the time of payment agreed with a customer. Some associations have tried to gain from fluctuations in exchange rates and acted as currency dealers, but this has not been always very successful.
(4) The effect of economies of scale is significant in sales and transport where costs per ton are reduced. This is the case especially for bulk products in which separate sales quantities are large.
(5) Economies of scale are also important in the cost of money. Usually the interest rate is lower for large associations, which deal with large sums, than for individual small companies.
(6) Using international standards, all Finnish forest industry companies are relatively small: the biggest Finnish company ranked 37 in the world in 1984, and Finland as a whole produces only slightly more market pulp, paper, and board than the largest company in the United States. The Finnish sales associations are, however, very often the biggest sellers in their market areas. This is important especially in bulk products in which usually a very small number of sellers covers the major part of the markets. In addition to prices, associations can influence also many other prevailing terms and conditions.
(7) Sales associations normally prevent unnecessary competition between Finnish companies, and therefore competitive measures can be directed toward foreign producers.
(8) For a buyer it is much easier to establish contacts with a major association than with a large number of companies, as the associations can offer the whole range of products in sufficient quantities. When the buyers

visit the producers, it is easy for them to visit several mills at the same time.

(9) Owing to their size, the sales associations are able to organize their internal training efficiently. Finnpap, for example, has its own "Paper School" – a twelve-week technical program designed for its marketing personnel.

(10) The associations can, due to their large sales network, organize a more extensive marketing research than single companies. In practice, however, the associations' marketing research has not always met the expectations of member companies, especially in technical market research. In data collection, however, the associations are superior to individual companies.

(11) Through associations the orders are distributed among mills evenly in relation to their production capacity. This helps some companies to smooth fluctuations in their production.

(12) Because the associations sell similar products from many mills, delivery security is good. A stoppage in production in one mill does not interupt delivery, as the product concerned can be replaced by an identical one from another mill.

6.5.3. Disadvantages of sales associations

There are also several disadvantages attached to sales associations. The major criticisms include the following:

(1) Sales associations tend to adapt their policies and activities to correspond to an average. This means that companies that are better off cannot be as efficient in their marketing as they would wish, e.g., by using the price parameter. Thus, the strong companies suffer at the expense of weak ones.

(2) In many cases companies have weak links with the markets because marketing personnel are employed by sales associations and not by them. Market information is often filtered and delivered uniformly to all companies. In part because of this, companies tend to be not market-, but production-oriented. Consequently, R&D inputs go more to improvements in processing technology than to the development of new products.

(3) Because of the sales associations, marketing has been easy for individual companies, and they have had no need to develop their own marketing expertise. The longer this situation continues, the more difficult it is for them to establish their own marketing activities. However, to educate marketing personnel and to create a marketing tradition, a company must have its own marketing organization.

(4) Marketing planning and investment planning have not been in balance in individual companies because the marketing planning has been carried out mainly in the associations, uniform for all companies, while the

investment planning has taken place in individual companies. This has led to a nonoptimal allocation of resources, a situation that is now changing.

(5) Vertical integration of production has increased continuously and will do so in the future. Because there are different associations for different parts of the production chain (pulp–paper–converted products), non-integrated marketing is not in harmony with the integrated production mode. There is, however, collaboration between sales associations, which reduces this disadvantage.

(6) Sales associations tend to emphasize their own image. In many products, especially in value-added goods, the image should be linked with the company that makes the products. For bulk products, however, a good universal image can be valuable.

(7) Because of their large size, the sales associations tend to be cumbersome and bureaucratic, and therefore do not always react quickly enough to changes in the markets.

(8) Finnish forest industry companies have internationalized much slower than, for example, Swedish ones. It has been claimed that this is due to the sales association system, which allows the companies to stay inside their domestic borders even when dealing with export activities.

6.5.4. The future role of sales associations

In recent years there has been increasing dissatisfaction with the role of sales associations in Finland. Some producing companies have even partly resigned and established and strengthened their own sales organizations. This has led to major restructuring in some associations. Before the 1970s exports consisted mainly of bulk products, and success was based more on a fast increase in demand than on skillful marketing. The word "delivery" described the activities of associations better than "marketing". Competition in the world market has, however, become increasingly tougher, and those associations which sell value-added products did not recognize the signals of change early enough. Now these associations – Finnpap and Converta – are experiencing an era of radical change in their mode of operation.

In spite of criticism, sales associations have had a decisive role in the success of the Finnish forest industry. It is quite obvious that they will be the most important export channel to the pulp and paper industry until the end of this century. They are efficient sellers in distant markets, where they can combine the interests of several companies, and are also suitable organizations for selling bulk products. Consequently, Finncell and Finnboard have less difficulties in proving the necessity of their existence than Finnpap and Converta. However, Finncell may prove to be unnecessary as pulp and paper production continue to integrate, which may lead to the disappearance of Finnish market pulp.

In general, sales associations are more suitable for small companies than for large ones, which can afford to have their own marketing organizations.

This statement, however, produces a contradiction, as large companies are very often bulk producers, although they also have mills that make value-added products. It is possible that in future the large companies will leave the marketing of their bulk products to sales associations and will take care of more refined goods themselves. Small companies are usually forced to rely on associations in all their products. As a countermove to this development Finnpap, for example, now tries to combine the benefits of a large organization and individual marketing by putting each sales person in charge of named products and mills instead of the earlier, more anonymous representation.

If other countries had had the same historical development as Finland, they probably would also have similar associations. In Western market economies the establishment of Finnish-type sales associations is now, however, very difficult. For example, the American experience with the International Trading Company system has not been entirely positive. In many countries the strict antitrust laws prevent collaboration between firms. The mergers of companies to form larger units seems to be a worldwide trend, which partly guarantees the same advantages as sales associations.

6.5.5. The mechanical forest industry

The Finnish mechanical forest industry also has its associations, but most of these have a minor role in exporting. This does not mean, however, that the wood industry companies have direct contact with their customers. On the contrary, there are often even three middlemen – the domestic agent, the agent abroad, and the importer abroad – between the producer and the end user. In many cases the producer has no control over these channel members, the importer usually being the "channel captain".

As in the chemical forest industry, the present form of the mechanical forest industry's marketing system is based on a long historical development. When the sawmill industry began its export operations the producers were small, their market information was poor, and their language skills modest or nonexistent. Therefore it was very difficult for entrepreneurs to get in direct touch with foreign buyers, and they had to trust agents and traders. This tradition is now more than 100 years old. Tightening competition, however, forces the producers to have direct contacts with clients and end users. Many companies in the mechanical forest industry have now established their own sales offices. In the sawmill industry more than 10% of exports goes through agencies owned by producing companies.

6.6. Challenges of the Future

6.6.1. Inheritance of the past

A theory of industrial trade asserts that a country will specialize in exporting products with which it can utilize its comparative advantage.

Usually this means products made with its relatively abundant factors of production. In the forest industries the key factor of comparative advantage has been the wood raw material. Access to industrially exploitable wood resources has primarily determined the global location of the industry. Hence, in Finland wood has traditionally served as the main natural resource for industry and trade.

The public control and institutional system of forest management is well-established in Finland. Laws prohibit the destruction of forests; consequently, the long-standing principle in exploiting the forests is that the total drain must not in the long run exceed the sustainable allowable cut. However, the period of vigorous expansion of the pulp and paper industry after World War II produced a temporary negative wood balance in the first half of the 1960s. Since then, the trend has shown increasing savings.

In the early 1960s, when the actual cut exceeded the allowable cut, great concern was felt about maintaining the growth potential of forest industry production. This led to forest-financing programs and to a remarkable increase in forest improvement. Consequently, it was possible to enlarge the allowable drain. In 1960 this was 55 million m^3, and in the mid-1980s it reached 67 million m^3. Unfortunately, the actual timber supply of forest owners has not met this level, and there are insufficient amounts of wood on the market for the needs of industry.

In 1960 the Finnish forest industry consumed 34 million m^3 (including bark) of wood raw material (i.e., roundwood and wood residues). In 1980 the corresponding figure was more than 59 million m^3. In both years the total drain from the Finnish forests was, however, about the same, or 60 million m^3. The 25 million m^3 increase in industrial wood use in these circumstances was only possible because of a remarkable internal change in the structure of the total wood use: other utilization of wood such as for fuel decreased (adding 11 million m^3 to industrial use), the industrial uses of wood residues increased (adding more than 6 million m^3), and Finland began to import wood instead of exporting it (adding more than 7 million m^3).

The volume of forest industry production increased even more than its wood use. Compared with the 75% increase in wood use from 1960 to 1980, the production volume increased by almost twice as much, i.e., by 130%. This was due to a move toward a higher degree of processing, the most important single factor being that increasing amounts of pulp are refined to paper products by the domestic industry. Also the conversion of paper and board to more value-added products has increased substantially. Similar developments in the sawmill industry have been relatively slow, and this may partly explain its modest performance.

The future expansion plans of the domestic forest industry must be realized in accordance with the development of available wood raw material. Compared with the past, options are now more restricted: nonindustrial wood use will become stable, while the possibilities of increasing the use of wood residues are practically exhausted. Although industry has begun to use increasing quantities of waste paper, the domestic consumption of paper and board is so small compared with production that this raw material source can never be

important in Finland. Finally, it may be too risky to build expectations on the possibilities of considerably increasing wood imports. Thus, the only notable sources for future expansions are in the increasing domestic roundwood supply and in the further refinement of products, including the use of pigments, clay, and other nonwood raw materials.

6.6.2. "Forest 2000" program

Because of the contradiction between the need to expand the forest industry's domestic capacity and the short supply of wood to meet this need, a new forestry program was launched in 1985. According to this "Forest 2000" program, the total actual drain should increase by 13 million m^3 from the early 1980s to the year 2000, i.e., 1% per annum.

If the "Forest 2000" program materializes in its proposed form, the Finnish forest industries' domestic production will have almost doubled from 1980 to 2000. At the same time, the internal structure of production will undergo a significant change. The panel industry and the sawmilling capacity would increase by only very little. Pulp production will continue its growth, the annual rate being between 2% and 3%. Growth will be even faster in mechanical pulp, the annual rate being from 3% to 5%, depending on assumptions concerning the use of spruce logs for pulpmaking. The increasing pulp production will offer essential expansion possibilities to the paper and board industry, the annual growth rate varying from 3.5% to 5%. In all, the annual increase in the production volume of all the forest industries could be between 2.6% and 3.3%. (From 1960 to 1980 the growth rate was 4.7%.) Thus, growth will diminish in the future, but it could exceed the forecast increase in the demand of the present market area for Finnish forest industry products. This would mean a necessity either to increase market share in the Western European countries or to find new markets. However, this is not an easy task as the earlier advantage that the coniferous forest zone of Scandinavia has enjoyed in pulp- and papermaking is being eroded and as the industry becomes established in areas where previously forests have been little exploited. These trends point toward tighter competition in the forest products markets.

The main obstacles to reaching the goals of the "Forest 2000" program are in the actual supply of wood and also in the industries' capability to invest. Since the early 1960s the trend in the actual cut has shown a decrease, although the allowable cut has increased. "Forest 2000" suggests a great number of different measures in order to change the present trend, but practically all of them are "carrots" and not "sticks", which means that their influence will be gradual. Thus, the target of increasing cuttings may not materialize as quickly as planned.

Although the forest owners would supply wood according to the allowable cut, this would not solve the problem, because the present structure of industrial wood demand does not correspond to the structure of the allowable cut. The largest wood supply comes from spruce logs and birch pulpwood. The products made from these timber assortments – spruce sawnwood and

nonconiferous pulp – are those products that will be among the least profitable for the Finnish forest industry. Spruce logs can, of course, also be used to make mechanical pulp, but the present capacity is relatively small compared with an appropriate one. Thus, huge investments are needed to process profitably all of the wood obtained from forests.

Large investments require a capability to raise sufficient capital to build the needed capacity. The Finnish forest industry has suffered from poor profitability for decades, the main reasons being high stumpage prices and the industry's low productivity. Despite weak internally generated funding, the industry has invested strongly (on average, 14% of sales since the mid-1960s), which has led to increased debts (the net debts have been between 60% and 85% of sales since the mid-1970s). Because it is no longer possible to increase the debts, the only way for industry to realize its planned investments is to increase internally generated funds. This course seems rather unlikely, however, which means that, in addition to the poor wood supply, the industry's capability to invest may also seriously hamper the growth of the Finnish forest industry's domestic capacity.

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Major Interviews

Marjo-Riitta Olkinuora, Manager, Finnpap.

Lauri Parikka, Head of Department, Central Association of Finnish Forest Industries.

Peter Stackelberg, Vice President, Kymi-Strömberg Oy.

Timo Teräs, Director, Finncell.

CHAPTER 7

Italy: Trends and Policies in the Trade of Sawnwood and Wood-Based Panels

M. Florio and E. Signorotto

7.1. Introduction

The objective of this chapter is to analyze the competitive position of the Italian industries in the international trade of sawnwood, veneers, plywood, particleboard, and fiberboard. We will focus on the performances of these industries and on the most likely scenarios for the next 5–10 years.

The balance of this chapter is divided into four parts:

(1) Section 7.2 deals with the problem of wood inputs for the manufacturing sector. This is a key issue for the future of the industries considered in this chapter, given their strong dependence on imports to obtain raw wood.

(2) In Section 7.3 we will consider, and try to explain, for each of the four products we are dealing with, the dynamics of some performance and specialization indicators during the period 1970–1984. One can see a general trend toward despecialization for each of the products, in spite of a tendency to differentiate the products within each sector in order to increase the value added.

(3) In Section 7.4 we discuss those policies that might be implemented and suggest that all the options open for the future be considered.

(4) In Section 7.5 we summarize our conclusions.

7.2. The Supply of Raw Wood

The total forested area of Italy was 6400 million ha in 1982 (that is, 21.2% of the land area) of which only 5.0% is located on the plains. Of the forested area, 44.5% is copse that cannot be used for sawmilling. On average, only 3.0% of the remaining forest area is cut periodically.

The total requirement of wood for the Italian economy has been estimated at 40 million roundwood equivalent m^3 in 1980 (Florio and Signorotto, 1982). The percentage requirements of each sector in the economy are estimated below, of which about 78% is covered by imports:

Paper	40.5
Building and joinery	25.9
Fuelwood	13.7
Furniture	11.4
Crates, pallets, etc.	6.8
Other	1.6

The sectors using sawnwood, veneers, plywood, particle- and fiberboard as inputs are building and joinery, furniture, crates, and pallets, amounting to about 44% of total wood requirements. The wood input for sawnwood and veneers is roundwood; for plywood, mainly domestically produced poplar; for particleboard and fiberboard, domestically produced poplar and other wood residuals from woodworking.

The consumption of roundwood grew at an average annual rate of 3.6% during the 1970s because of the remarkable growth of those Italian industries using it. This rate of growth would have been even higher if two substitution processes had not taken place: wood-based panels for sawnwood and plastic laminates and decorative paper for veneers. Furthermore, roundwood consumption has been lower in the past because of the final goods producers' strategies of increasingly buying veneers abroad. This explains why the propensity to import roundwood has remained almost stable since the early 1970s, in spite of rigidity in the domestic supply (see *Table 7.1*; *Figures 7.1* and *7.2*).

As far as particleboard and fiberboard are concerned their main wood input is poplar, whose production (see *Figure 7.3*) in Italy amounts to about 38% of the total domestic production of wood for industrial uses. Therefore, these two industries are much less dependent on imports than the sawnwod and veneer ones.

Table 7.1. Imports of roundwood by country – percentage shares in value in 1983 (Federlegno-Arredo, 1984).

Coniferous		*Broad-leaved*		*Tropical*	
Switzerland	20.4	Yugoslavia	22.1	Ivory Coast	75.7
Austria	20.1	France	21.6	Cameroon	6.8
USSR	18.8	Switzerland	15.1	Congo	5.4
West Germany	15.9	Austria	13.5		
Others	24.8	Others	27.6	Others	12.1

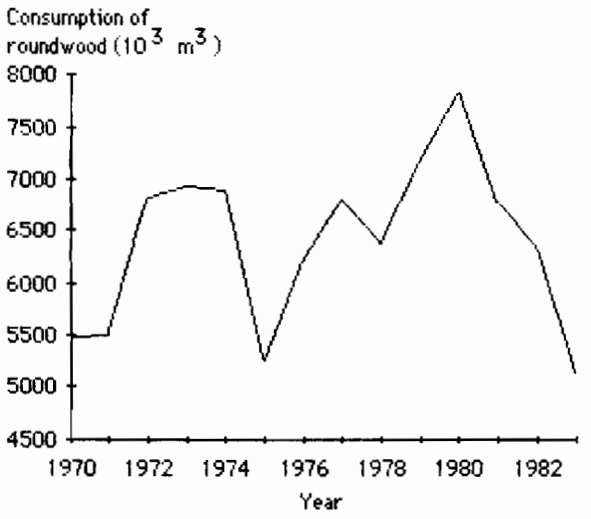

Figure 7.1. Consumption of roundwood (1000 m^3) [Centro Studi Industria Leggera (CSIL) estimates using data from ISTAT, 1984a].

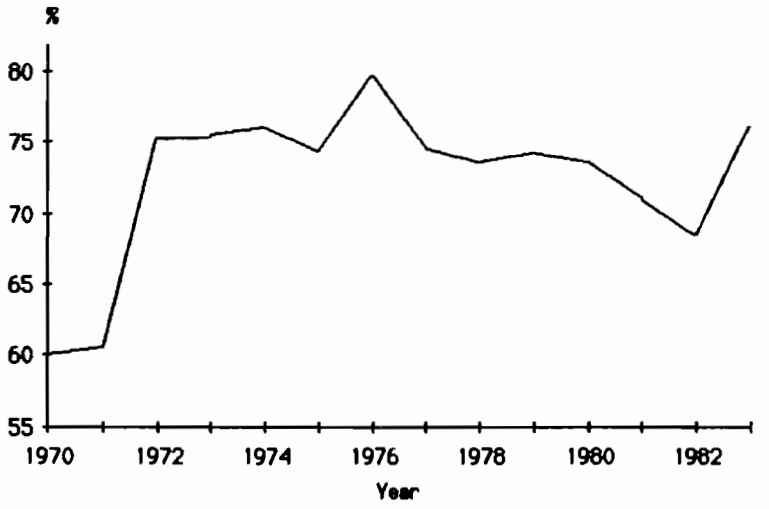

Figure 7.2. Propensity to import roundwood (imports of roundwood/domestic consumption of roundwood in quantities; source as for *Figure 7.1*).

The other domestic wood resource, in addition to poplar, is copse wood (see *Figure 7.4*), which is mainly used as input in the particleboard and fiberboard industries as well as in pulp and paper production.

To summarize: from the point of view of wood supply, the main problem for the four industries mentioned above is the rigidity of domestic supply, with the partial exceptions of poplar and copse wood.

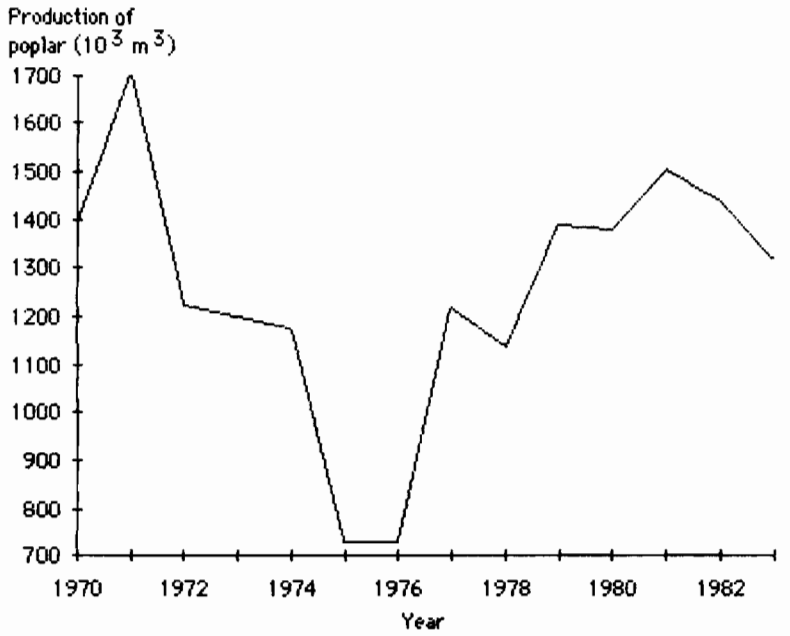

Figure 7.3. Production of poplar (1000 m^3; source as for *Figure 7.1*).

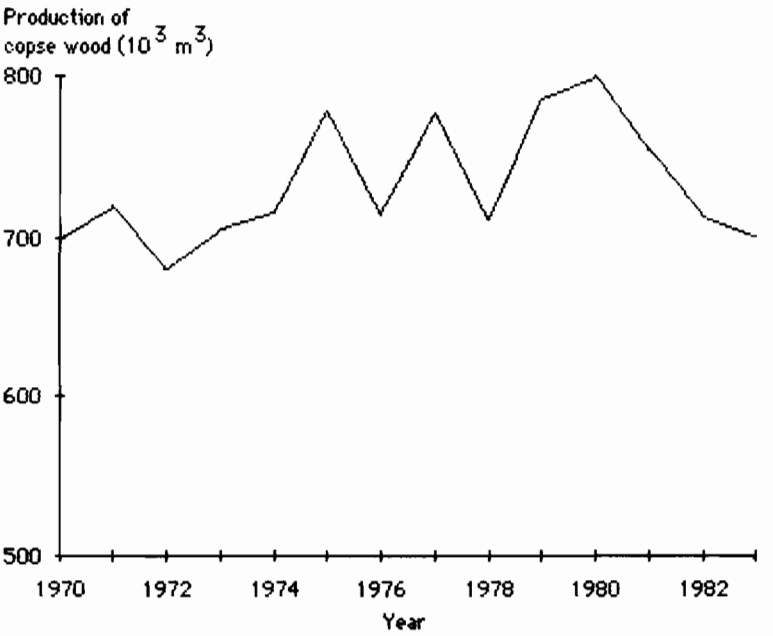

Figure 7.4. Production of copse wood (1000 m^3; source as for *Figure 7.1*).

7.3. International Specialization and Competitiveness of the Primary Wood-Processing Industries

7.3.1. Sawnwood

The main results of the data analysis concerning the 1970–1984 period are the following. The propensity to import sawnwood, already high at the beginning of the 1970s, increased even further to 76.6% in 1984. This is explained by a relatively high growth rate of sawnwood consumption along with a slower growth in domestic production. Exports remain negligible.

Obviously, the indicator of the degree of international specialization shows a constant and complete despecialization during the period 1970–1984. We note that 50% of coniferous sawnwood is imported from Austria and 50% of nonconiferous sawnwood from Yugoslavia. As for tropical sawnwood the Far East has become the main supplying region (about 80% comes from Indonesia and Malaysia). What emerges is the strong integration of Italy's foreign trade with its neighbors, confirming the important role of transportation costs in shaping trade relations.

Such costs, however, do not make up for the lower competitiveness of African producers compared with the more efficient ones in the Far East. The latter have overcome the Africans' advantages and now the Far East has become the main exporting region of tropical sawnwood to Italy.

At present there are neither tariff barriers nor pressures to restrict foreign competition, in spite of the deep crisis in the domestic sawmilling industry.

The increasing share of sawnwood imported from the USSR is also worth noting. The importance of supplies from outside the EEC is increasing, which will create new opportunities for bilateral commercial agreements.

7.3.2. Veneer

During the 1970s consumption of veneer in Italy grew at an annual rate of 10% owing to the fast-growing furniture industry. At the same time, we note a striking trend of increasing import penetration into the domestic market and a decrease in the export share of production (see *Figures 7.5* and *7.6*).

The indicator of international specialization confirms a strong trend toward despecialization for this sector (*Figure 7.7*). As can be seen in the figure, import surpluses increased very significantly, compared with total trade.

Moreover, the ratio between the unit value of exports and that of imports decreased during the period 1970–1984 because of increasing difficulties for the producers in obtaining tropical roundwood at a "reasonable" price. These difficulties have forced the domestic producers to change to lower-quality species, causing a decrease in the relative price of the product (see *Figure 7.8*).

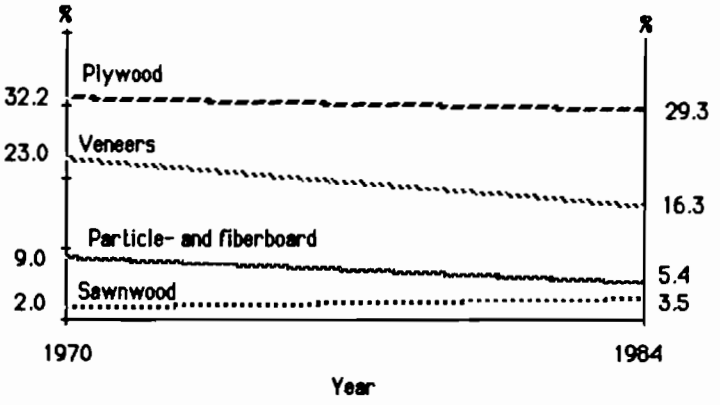

Figure 7.5. Export/production ratio (%) in quantities (CSIL estimates from ISTAT, 1984b).

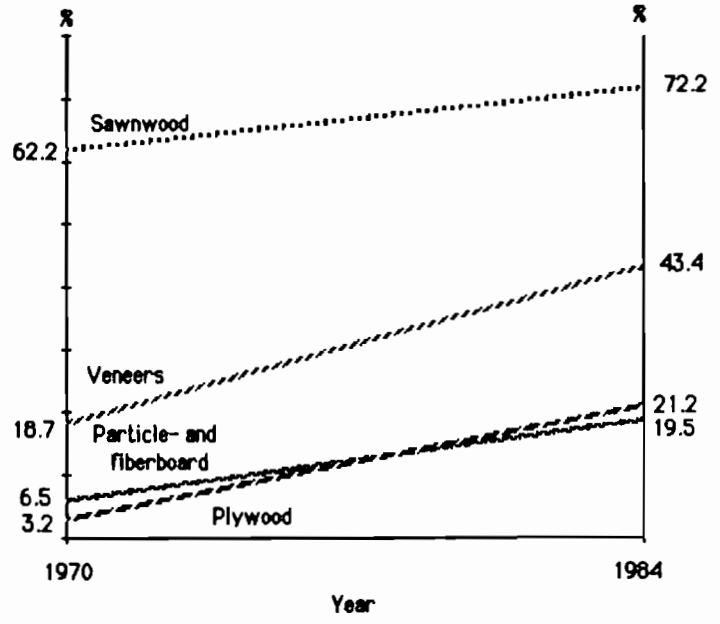

Figure 7.6. Import/domestic consumption ratio (%) in quantities (source as for *Figure 7.5*).

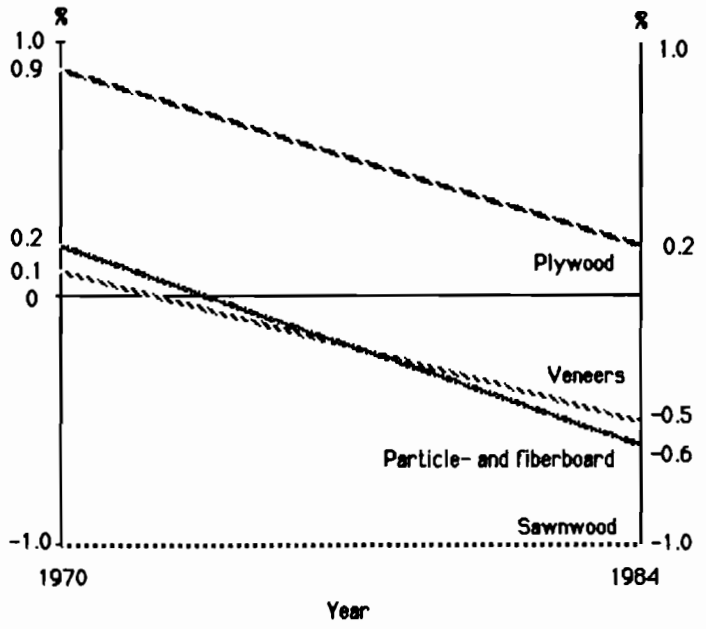

Figure 7.7. Specialization indicator $(X - M)/(X + M)$, where X = export quantities and M = import quantities. This indicator varies between +1 (complete specialization) and −1 (complete despecialization) (source as for *Figure 7.5*).

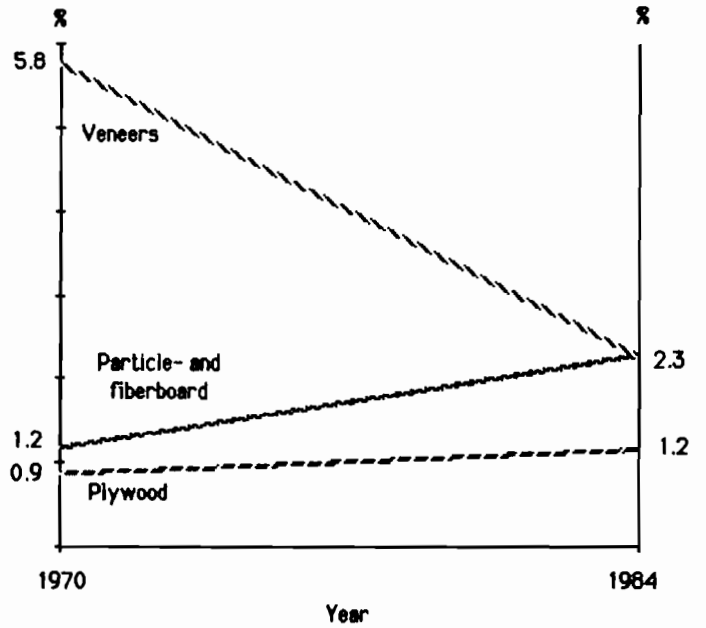

Figure 7.8. Ratio of the unit value of exports and that of imports (source as for *Figure 7.5*).

The negative performance of this industry is, in some ways, paradoxical, since Italian technology is one of the most advanced and sophisticated in the world. Therefore, the reasons for this disappointing trend must be other than technological ones, i.e.:

(1) Increasing relocation of Italian production in other countries, especially in Cameroon, which has become the main import market for Italy.
(2) Increasing production capacities in those countries with forest resources.
(3) Price increases in roundwood for veneers higher than those in other countries because of exchange rate trends and higher transportation costs due to the inefficiencies of the Italian port system. (In fact, many importers prefer to use North European instead of Italian ports because of the former's substantially lower handling and shipping charges.)

7.3.3. Particleboard and fiberboard

Consumption of particleboard and fiberboard in Italy grew at an annual rate of 12% during the 1970s. The explanations for this growth of demand are:

(1) The very high growth rate of the furniture industry.
(2) The widespread substitution of wood-based panels for sawnwood in the Italian furniture industry's manufacturing techniques.

Domestic production has increased at the lower annual rate of 9.2%, allowing import penetration into the domestic market. Italy, which had an export surplus in this sector in the early 1970s, has become increasingly less specialized.

This has occurred in spite of firms' attempts to change the product mix toward better-quality products with a higher value added (for example, laminated panels). This explains the remarkable increase in the ratio of the unit value of exports to that of imports (*Figure 7.8*). This trend towards despecialization has taken place in spite of the availability of domestic wood supply (poplar and copse wood), as mentioned, above.

The reasons for this negative tendency – at least in the particleboard industry, which has a generally higher value added than fiberboard – are:

(1) Plywood and pulp production compete with the particleboard and fiberboard industry for the scarce domestic wood resources, creating higher wood prices.
(2) The production of poplar and copse wood does not take economic and industrial goals into account. Public policies have never considered these natural resources from the point of view of their industrial utilization.
(3) The industry is inadequately concentrated, with too many small plants and a consequent loss of economies of scale.

(4) The crisis of the sawmilling industry has decreased the total amount of wood residuals from sawmilling, forcing particleboard and fiberboard producers to resort to copse wood at higher costs.

The recession and strong competitive pressures in the last few years have induced European producers to study the possibility of adopting an anti-dumping policy against some countries, e.g., Yugoslavia. Yugoslavia has in fact gained an increasing share of the Italian market in the last few years, and it is now the third exporting country in the Italian particleboard market, after Austria and West Germany.

7.3.4. Plywood

In Italy the problem of plywood is not much different from that of the particleboard and fiberboard market. We might even say that this sector has, in some ways, anticipated the fate of the particleboard industry, having gone through the same dynamics a few years earlier.

Here, too, along with a growth in plywood consumption at an average annual rate of 3.8% during the 1970s, production grew at a lower rate (2.0%). This has allowed increasing import penetration into the domestic market.

As we have seen in *Figure 7.7*, Italy was highly specialized in plywood production in the early 1970s. Since then it has gone through a process of despecialization. This has happened in spite of the strategy adopted by plywood producers to increase the share of higher-quality products, as the increased ratio between the unit value of exports and that of imports shows.

Competitive pressures from countries outside the EEC have created the introduction of a tariff at the EEC level, supported mainly by French firms, who are the only EEC producers of phenolic plywood.

7.3.5. Summary and prospects

The picture resulting from our analysis is of increasing despecialization and loss of the Italian industry's competitiveness in all the sectors we have considered. (However, there is a basic difference among these industries: as far as sawnwood and veneer sheets are concerned, the diseconomies related to the lack of domestic roundwood supply are remarkable, and probably are the cause of the irreversible decline of these industries.

On the other hand, in the case of plywood, particleboard, and fiberboard, the existence of a domestic wood supply has allowed a higher growth of domestic production during a period of a large increase in demand (especially for particleboard and fiberboard).

However, in the next 5–10 years, the growth of demand for plywood, particle- and fiberboard is expected to be much lower than during the 1970s. The demand for particleboard and plywood will increase at a lower rate in the future because of the slower growth in furniture consumption and the end of

the substitution process of panels for sawnwood in the furniture industry. Therefore, the main challenge will be the pursuit of greater economies of scale, leading to more industrial concentration and to higher-quality products. There will be some room for public policies to support and accelerate market trends in this direction.

7.4. Commercial, Industrial, and Forest Policies

In this section we will briefly analyze the public policies that might be implemented to affect the dynamics of the primary wood-processing industries. We will discuss hypothetical policies since, until now, no effective policies have been implemented.

Here, too, we will distinguish between sawnwood and veneer on the one hand and plywood, particleboard, and fiberboard on the other.

7.4.1. Sawnwood and veneer

For these products, due to rigidity in domestic supply and to scarcity of domestic wood resources, import substitution based upon protectionist policies is not economically feasible. Even if the revenues from the introduction of a tariff were assigned to the financing of a forestation policy, the period of time required to overcome the scarcity of wood resources would be too long. In this case protectionist policies would only damage the user industries and, eventually, consumers.

Considering the deep crisis in the sawnwood and veneer industries, there will be pressures against foreign competition in the form of a request for subsidies. This will be especially the case if the loss of competitiveness of these industries becomes a regional problem. The veneer industry is a good example, being mostly located in a single region of northern Italy: Lombardy. In this case local government might be willing to accede to social pressures in order to maintain employment.

Obviously, this kind of policy will not be able to solve the structural problems of these industries – above all, the lower competitiveness of Italian producers. This does not mean that nothing can be done; there are policies less expensive for the taxpayer and with greater benefits, such as:

(1) Encouraging the trend among sawnwood and veneer producers to give up manufacturing activity and change to the more profitable business of imports. This would preserve the technical and market knowledge developed by many firms within a strategy aimed to rationalize the supply of wood and primary wood products.
(2) Supporting cooperation with countries that are owners of wood resources and particularly with the developing countries. This can be done by promoting joint ventures and by using advanced Italian technology in the field of woodworking machines.

This latter strategy has been successfully developed by other European countries. Basically, it would require the implementation of policies aiming to foster investment abroad and the transfer of technology, within a process of internationalization of the domestic companies. Such a policy would have a greater chance of success in the veneer industry, where the quality of the management is good and where there are fewer obstacles related to the average small size of the firms.

Both policies imply a reduction in domestic production capacity, with consequent employment-related problems, but they might be more advantageous in the long run.

7.4.2. Plywood, particleboard, and fiberboard

In these sectors protectionist pressures and demand for subsidies have increased during the 1980s. We believe that such policies simply postpone the problems of these sectors without solving them.

For plywood, particleboard, and fiberboard there is room for policies aimed at an efficient, even significant, growth in these industries. There are ways to implement specific policies aimed at developing domestic fast-growing wood resources such as poplar and copse wood. Considering the speed of the poplar's growing cycle (8–10 years) and the remarkable amount of wood produced, the development of this domestic resource could be a substantial contribution in overcoming one of the main constraints to growth in this sector.

One might, for instance, consider the opportunity to support common import substitution policies among the EEC Mediterranean countries, such as the introduction of an *ad valorem* tariff on plywood and particleboard, aimed at the financing of poplar cultivations.

7.5. Conclusions

The conclusions of this brief analysis of the Italian position in the international trade of these four important forest products can be summarized as follows:

(1) An increasing flow of imports of intermediate forest products characterizes the period 1970–1984. From this point of view, Italy must be considered less a raw material importer and more and increasingly an importer of manufactured wood products. Imports of sawnwood, veneers, and wood-based panels are equal to, and partially substitute for, roundwood imports. This is because many final goods producers find it increasingly cheaper to resort to the international market in spite of transportation costs, a more complex system of purchasing and marketing, and the risks linked to trade and changing exchange rates.

(2) The trend described in (1) is much more marked for sawnwood and veneers. In the case of plywood, particleboard, and fiberboard, the

trend toward despecialization is not explained by lack of domestic wood resources, given the actual and potential availability of poplar and copse wood. The reasons for this decline in competitiveness are to be found mainly in inefficient marketing and industrial organizations.

(3) As for sawnwood and veneer, there is not (and cannot be) a great demand for protection, but only measures to contain the effects of the crisis through subsidies. On the other hand, in the plywood and particleboard industries the resistance to despecialization is much stronger and gives rise to a demand for protection against countries outside the EEC. In spite of these pressures against foreign competition, the most likely scenario for the next 5–10 years is a tendency toward increasing despecialization (the same is true also for plywood, particleboard, and fiberboard): that is, imports will increase faster than exports.

(4) Thus, there is the danger that, except for sawnwood and veneer, the exporting sectors of Italian woodworking industries (such as furniture) might become too heavily dependent on imports. This would contribute to an increase in the already high import elasticity, causing a deterioration in the foreign trade balance, which is a major constraint to the growth of the Italian economy.

(5) An alternative to this trend might be studied within the EEC programs for the Mediterranean countries, especially as some aspects of the Italian problem also apply to Spain. The industrial cultivation of poplar and other fast-growing species might be subsidized with a small tariff on plywood and particleboard imports. At the same time the government might support the process of concentration in these industries, aiming to create a few large modern companies, able to exploit the existing economies of scale and to put an end to disruptive competition on these markets.

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CHAPTER 8

Japan: The Timber Trade and Its Problems

Isamu Nomura

8.1. Introduction

According to the FAO (1978) the volume of world timber trade consisted of 114 million m^3 of logs and 75 million m^3 of sawn lumber. Of this, Japan's import share was 46% of logs and 5% of sawn lumber. Thus the country's share of the world's volume of log trade accounted for about one half of the total – extremely large in comparison with that of other countries.

Then when we consider Japan itself and take 1983 as an example, out of the total consumption of 91.2 million m^3 of timber, imported timber had about a 65% share (58.9 million m^3). This came mostly from the Southeast Asian countries, North America, and the USSR, and also, although the quantities were not large, from New Zealand, Australia, Chile, Taiwan, and Africa.

As can be appreciated, although there were some exports of sawn lumber, the volume was very limited (approximately 640000 m^3 was the actual 1983 export figure, or less than 1% of the year's total demand for timber). We may say that the timber trade was principally in the form of imports and, furthermore, that these had a very large share of the timber market in Japan.

This chapter discusses the history, the current situation, and the present problems faced by the Japanese timber trade.

8.2. History of Timber Imports

The discussion will be limited to the history of timber imports after World War II to the present and their characteristics, and will be roughly divided into three periods:

(1) The period of resumption of imports and their expansion from the end of the war to 1960.

(2) The period of rapid increase in imports from 1961 to 1973.
(3) The period of increasing market domination by imported timber from 1974 to the present.

8.2.1. First period: resumption and expansion of imports

On 15 August 1945, Japan met defeat against a backdrop of desolation and exhaustion. This was the catastrophic end of the long and difficult road traveled since 1937, when the Sino-Japanese Incident occurred. From the date of defeat to April 1952, occupation by the US armed forces continued; and during this period the dissolution of the "Zaibatsu" (financial combines), agrarian reform, the elimination and prohibition of monopoly, the revisions of the Constitution, and abolition of various tax systems (government control over timber supply and demand was removed in 1945) were carried out. Political and economic systems took an overall democratic course, and gradually the economy showed an improvement. However, high inflation continued against a backdrop of an absolute insufficiency of supplies, and the Japanese people led miserable lives.

Amidst such circumstances, in 1949, under the guidance and supervision of Joseph M. Dodge, who came to Japan as an adviser to General Douglas MacArthur, measures were established to control the severe inflation, which gradually showed signs of coming to an end. On the other hand, there were other gloomy aspects, such as unemployment and corporate bankruptcies.

Starting with the outbreak of the Korean War in June 1950 (hostilities ended in July 1953), deflation policies were forgotten, and the economy again traveled toward inflation. In 1953 there was the investment rush, in 1956 an unprecedented economic boom, and then, in 1959, another economic boom developed. Between these periods there was a slowdown in growth and economic fluctuations, but the real economic growth rate during 1952–1955 registered approximately 7%. In 1956–1960 the growth rate was approximately 9%, unusual by world standards, and a remarkable economic recovery and improvement.

As a consequence, a great demand for timber, an important key material, developed. A review of this demand (with the exclusion of firewood and charcoal) during this period shows that for sawn timber demand increased (taking 31.8 million m^3 in 1951 as 100%) to 139% in 1955 and to 172% in 1960, with a continuous upward trend.

Timber demand, which showed such a significant increase, was supplied mainly by domestic timber, and there was no large volume of foreign timber imported as in subsequent periods. Foreign timber imports for 1949 were 40000 m^3, only 0.2% of the total timber demand. In 1955 the import volume was 2.05 million m^3, or 4.6%, and in 1960, it was 6.38 million m^3, or only 11.6% of total demand. It may be concluded that the principal timber supply during this period was domestic.

The production and supply of domestic timber during this period took place under very adverse conditions as the loss of forests, due to Japan's

defeat, amounted to more than 40% in area and more than 30% of the standing timber. Furthermore, the forests were decimated due to excessive and uncontrolled cutting during the war.

Of the domestic timber supply in 1951, 81% was privately owned and 19% was national forest; in 1955, the ratio was 78% and 22%; and in 1960, the shares were 73% and 27%. In other words, during this period most of the domestic timber supply came from privately owned forests. Gradually, however, the privately owned share decreased, and the national percentage increased, and it may be considered that the supply from the private forests was becoming exhausted.

8.2.2. Second period: rapid increase in imports

Simultaneously with the inauguration of the Ikeda Cabinet in July 1960, a full-scale rapid economic growth was initiated, supported by active fiscal and monetary policies. The economy fluctuated, with the recession in 1962, "the Olympic Games boom" in 1963–1964, and the slowdown in 1965, followed by an increase in business prosperity in 1966. However, as the general trend for 1961–1973, the real economic growth rate registered a very high average 11% annually. Influenced by such a trend in the general economy, the demand for timber also increased.

If we express the volume changes in timber demand, with the 61.6 million m^3 in 1961 as 100, 1965 was 115, 1970 was 167, and 1973 registered 191. Thus, during this period there was close to a twofold increase (see *Table 8.1*). What, then, was the trend of timber supply versus this remarkable increase in timber demand? There were extreme changes on the supply side during this period, and continuing to the present. These show a large increase in imports of foreign timber and a contrasting decline and gradual decrease in the supply of domestic timber.

If the volume of domestic timber supply of 50.8 million m^3 in 1961 was 100, 1965 was 99, 1970 was 91, and 1978 was 83 – a gradual decrease. On the other hand, foreign timber supply was 10.7 million m^3 in 1961, which was 18% of the total timber supply. In 1970 the supply was 56.4 million m^3 (55% of the total), and in 1973 it was 75.4 million m^3 (64% of the total); so both in absolute volume and in share there were sharp increases in imports (see *Table 8.1*).

Not only did foreign timber rapidly increase in volume but, since 1961, there has also been a major change in quality. The first change was that there was a very large increase in North American and USSR timber imports, particularly the former, which is a strong competitor in demand for the main native tree species. This means that imported timber had gained a strong advantage as a substitute for domestic timber.

The import trend expressed in volumes by exporter country is as shown in *Table 8.2*. In 1960 South Sea timber (i.e., tropical wood) had a 72% share of total imports, the USSR 14%, North America 9%, and others 5%; but in 1961 the share for South Sea timber decreased to 58%, USSR timber remained at 14%, and North American timber imports increased sharply to 23%. Since then, this

Table 8.1. Japanese timber demand and supply (1000 m^3) from 1960 to 1983 (Forestry Agency, *Timber Demand and Supply*).

	Demand					*Supply*								
							Domestic timber			*Foreign timber*				
Year	*Total*	*Sawn lumber*	*Plywood*	*Pulp/ chip*	*Other uses*	*Total*	*Total*	*Logs*	*Scrap wood*	*Total*	*Logs*	*Sawn lumber*	*Others*	*Import ratio (%)*
1960	56547	37789	3178	10189	5391	56546	49006	48515	491	7541	6674	211	656	13.3
1961	61565	40891	3365	11834	5475	61565	50802	49893	923	10749	9144	792	813	17.5
1962	63956	41964	4090	12805	5097	63956	50802	49807	995	13154	11251	897	1006	20.6
1963	67761	44424	4352	14615	4370	67761	51119	50193	926	16642	13395	1254	1984	24.6
1964	70828	46751	4943	15053	4081	70828	51660	50678	982	19168	15692	1296	2180	27.1
1965	70530	47084	5187	14335	3924	70530	50375	49534	841	20155	16721	1115	2319	28.6
1966	76876	50373	6257	16375	3871	76876	51835	51023	812	25041	20228	1605	3208	32.6
1967	85947	55398	7476	19375	3698	85947	52741	51813	928	33206	26254	2607	4345	38.6
1968	91806	58981	8912	20225	3688	91806	48963	48169	794	42843	33039	3290	6514	46.7
1969	95570	59534	10597	22122	3317	95570	41817	46062	755	48753	38265	2705	7783	51.0
1970	102679	62009	13059	24887	2724	102679	46241	45351	890	56438	43281	3957	9200	55.0
1971	101405	59801	13362	25715	2527	101405	45966	45253	713	55439	43909	2792	8738	54.7
1972	106504	63613	14309	26202	2380	106504	43941	43114	827	62563	47697	3222	11644	58.7
1973	117580	67470	17151	30414	2545	117580	42208	41583	625	75372	52485	4666	18221	64.1
1974	113040	60734	14481	34957	2868	113040	39474	38874	600	73566	48453	4287	15930	65.1
1975	96369	55341	11173	27298	2557	96369	34577	34155	422	61792	42681	2964	16147	64.1
1976	102609	57394	12939	29639	2637	102609	35760	35271	489	66849	45118	3821	17910	65.1
1977	101854	56564	12717	29841	2732	101854	34231	33793	438	67623	44561	4125	18937	66.4
1978	103417	57560	13585	29597	2675	103417	32558	32145	413	70859	46158	4467	20234	68.5
1979	109786	60314	13915	32137	3420	109786	33784	33270	514	76002	46950	5656	23396	69.2
1980	108964	56713	12840	35868	3543	108964	34557	34051	506	74407	42395	6136	2587	68.3
1981	91829	48718	11086	29056	2969	91829	31632	31370	262	60197	35932	4162	20103	65.6
1982	90157	47862	10499	28279	3517	90157	32154	31904	250	58003	33026	5167	19810	64.3
1983	91161	45990	10849	30584	3738	91161	32316	31990	326	58845	32587	4616	21642	64.6

Table 8.2. Japanese timber imports (1000 m^3) by exporter countries (Ministry of Finance Customs Statistics).[a]

	North America		*USSR*		*South Sea*		*Others*		*Total*	
Year	*Volume*	*Share (%)*	*Volume*	*Share (%)*	*Volume*	*Share (%)*	*Volume*	*Share (%)*	*Volume*	*Share (%)*
1960	553	8.7	921	14.4	4568	71.6	337	5.3	6379	100.0
1961	2211	22.9	1315	13.6	5549	57.6	560	5.9	9635	100.0
1962	2384	21.6	1673	15.1	6373	57.7	617	5.6	11047	100.0
1963	3562	25.5	1857	13.2	7798	55.8	765	5.5	13982	100.0
1964	4113	26.9	2397	15.7	7868	51.4	924	6.0	15302	100.0
1965	4237	25.2	2536	15.1	9333	55.6	692	4.1	16798	100.0
1966	5498	25.0	3607	16.4	11935	54.4	909	4.1	21949	100.0
1967	8435	29.8	5078	17.9	13674	48.4	1092	3.9	28279	100.0
1968	11183	33.3	5861	17.5	14878	44.3	1645	4.9	33567	100.0
1969	9782	27.3	6151	17.2	17814	49.8	2060	5.8	35807	100.0
1970	12511	29.5	7095	16.8	20678	48.8	2082	4.9	42366	100.0
1971	9332	23.2	7071	17.5	21689	53.8	2233	5.5	40325	100.0
1972	12523	28.0	7922	17.7	21898	48.9	2419	5.4	44762	100.0
1973	13313	25.5	9155	17.5	26969	51.6	2843	5.4	52280	100.0
1974	11469	24.1	8306	17.4	25512	53.6	2346	4.9	47633	100.0
1975	11625	30.4	7872	20.6	17628	46.1	1137	3.0	38262	100.0
1976	12848	28.6	8168	18.2	22388	49.9	1486	3.3	44890	100.0
1977	13264	29.2	8833	19.4	21678	47.7	1690	3.7	45465	100.0
1978	13434	28.9	8961	19.3	22364	48.0	1752	3.8	46511	100.0
1979	16365	32.8	8013	16.1	23078	46.2	2446	4.9	49902	100.0
1980	14865	34.5	6297	14.6	19656	45.6	2265	5.3	43083	100.0
1981	10678	32.2	5770	17.4	15493	46.8	1177	3.6	33118	100.0
1982	12225	34.6	6120	17.3	15865	44.9	1148	3.2	35359	100.0

[a] The reasons why the totals in *Table 8.2* do not agree with the foreign timber totals in *Table 8.1* are that the survey systems differ, chip and pulp are not included, and the actual volume of processed wood is given without converting it to log volume.

trend has become stronger, and in 1973 the South Sea timber share was 48%, the USSR 19%, North America 29%, and others 4%.

The second change concerned the structure of the tree species of North American imports. The breakdown by tree species for the total North American import volume in 1958 was Port Orford cedar 42%, Douglas fir 24%, and spruce 0.3%. Western hemlock was almost disregarded, but in 1961 this had a 69% share, spruce 11%, Douglas fir 9%, Port Orford cedar 4%, and red cedar 2%. Such changes in the quality of imported timber were initially considered as merely supplementary timber to cover the shortage in the domestic timber supply, but the situation progressed to the point of causing the *White Paper on Forestry* to comment: "Based upon the recent timber supply/demand and the timber price formation, foreign timber has come to exert a great influence."

What were the causes of the above changes at the supply side or of the sharp increase in foreign timber imports and the slowdown and decrease in the supply of domestic timber? First, let us discuss in some detail the cause of the sharp increase in foreign timber imports, our main subject.

The reasons may be roughly divided into two categories: the necessary condition and the sufficient condition. The necessary condition was the removal or easing of the restrictions on exchange, which existed in the earlier period (post-World War II to 1960).

Exchange controls (which had an even greater effect on postwar foreign timber imports than the timber tariff: see *Table 8.3*) show a number of changes, but North American logs and sawn timber were liberalized in 1956, followed by South Sea logs in 1960, USSR logs in 1961, USSR sawn timber in 1962, South Sea processed wood in 1963, and South Sea sawn lumber in 1964.

However, on logs, which form the main segment of Japanese foreign timber imports, exchange controls were removed in 1961, with controls on USSR logs the last to be removed.

Next, since Japan's wartime defeat, most tree species were exempt from the timber tariff; and even when it was imposed, the rate was low. But due to a tightening of the balance of supply and demand and the US request for liberalization based on its removal or the reduction, the timber tariff made greater progress.

To explain the 1951 revision: with the exception of specific tree species, all logs were exempt from the tariff. Only some sawn lumber was taxed, but in 1954 Tsuga sawn lumber was made duty-free, *Chamaecyparis* and *Thuja* sawn lumber (not more than 20 cm thick) were the only items left on the tariff list. After this, although there were some intricacies, the details are now as shown in *Table 8.4*.

Although tariffs on sawn lumber, of *Pinus*, *Abies*, and *Picea Larix*, and that of plywood still remain, from the point of view of the volume of imported timber, tariffs in Japan may be regarded as generally progressing toward reduction or removal.

Such were the developments in the post-World War II exchange control and timber tariff system. As may be seen from these, we may assume that the two major factors of checking and controlling postwar timber imports have

Table 8.3. History of the removal of exchange controls relating to Japanese timber imports.[a]

	South Sea		*USSR*		
Year	*Logs*	*Sawn timber*	*Logs*	*Sawn timber*	*North America*
1948					
1949					
1950	FA	FA	FA	FA	FA
1951	AA	(processed			
1952		wood only)			AA
1953					FA
1954	FA				
1955					
1956					AA
1957			Check AA		
1958					
1959					
1960	AA				
1961		AFA (sawn lumber	AA		
1962		and plywood)		AA	
1963					
1964		AFA (all)			

[a] Foreign currency system under CHQ control until 1949; FA: foreign currency allocation system, AA: automatic approval system, AFA: automatic foreign currency allocation system. In reality, AFA together with AA means liberalization.

been reduced or removed altogether. This, however, is insufficient to explain the sharp increase in imported timber, which began in 1961. We must take into consideration the active factors or, in other words, the sufficient condition.

First, prices of imported timber are relatively low compared with those of domestic timber, and the supply is relatively large and stable. These characteristics may be considered as basically common to the foreign timber sources:

(1) The relative abundance of forest resources.
(2) Large-scale ownership.
(3) Mostly level land easily accessible to large machinery.
(4) In the case of South Sea timber, a low wage prevailing in the producing areas.

Second, as may be noted from recent trends in construction, a greater demand and moves toward standardization are evident.

Third, the general trading companies, which are responsible for distribution of foreign timber, have integrated the log wholesalers, sawmills, and plywood mills into their respective groups by adopting a system for longer-term note settlement, by which sales activities are greatly encouraged.

Fourth, there has been a large reduction in shipping freight and loading costs through the adoption of the carrier-ship system. The appearance and adoption of timber carriers began in 1965, and in 1971 there were more than

Table 8.4. Timber tariffs (%) in Japan, the EEC, and the USA as of April 1974 (Forestry Agency, 1984).

	Japan[a]		*EEC*		*USA*	
Product	*Current*	*MTNP*[b]	*Current*	*MTNP*	*Current*	*MTNP*
Logs	0	–	0–2.7	0–2.5		
Chips	0	–	0	–		
Sawn lumber:						
Larix (< 16 cm thick)	10	–	0–4.3	0–3.8	birch,	
Pinus, Abies, Picea, Larix (≥ 16 cm)	0	–	0	–	white oak =	
Lauan	10 (5)	–	0	–	0.4	0
Pinus, Abies, Picea (< 16 cm)	9	6	1–4.3	0–3.8	other =	
all others	0	–	0	–	0	
Processed wood:						
Pinus, Abies, Picea, Larix:						
< 16 cm thick	10	–	4.4	4		
≥ 16 cm thick	0	–	4.4	4		
Lauan	10 (0)	–	4.4	4		
Veneer for plywood	15 (7.5)	–	6.4	6	0	–
Plywood:						
Both sides softwood	15	–	11.1	10	20[c]	8
Surface-processed	18.8	15	11.1	10	8[d]	8
Other:					4.7–12.5	
< 6 mm thick	20	–	11.1	10		
≥ 6 mm thick	19.3	17	11.1	10		3.8
Particleboard	12 (0)	12	10.8	10	4.8–6.3	4

[a] Preferential tariff for developing countries in parentheses.
[b] MTNP = multilateral trade negotiation permission.
[c] One side softwood.
[d] Lauan surface.

125 in service. We shall take North American timber as an example. When we compare the total freight and loading costs in 1966, for nontimber carriers the cost was $48 per 1000 BM (approximately 2.63 m^3) while that for timber carriers was $31. Next, when we review the cost and freight C&F share of the total cost of freight and loading, we see that it was 86% in 1962, 42% in 1966, and 37% in 1970, which clearly indicates a gradual decreasing trend.

Let us now briefly review the reasons for the stagnation or gradual decrease in the domestic timber supply. First, in Japanese forests, particularly the plantations consisting mainly of "sugi" (Japanese cedar), "hinoki" (Japanese cypress), and "karamatsu" (*Larix*), the majority of the forest stands are still in the young age group.

Second, as can be seen from *Table 8.5*, we must note the rising costs of log production (logging wage) compared with the price of sawn lumber/wood products. The increase in log production costs (logging wage) is the result of Japan's high-growth economy, mainly in its modern industries, and also, the very small scale of the forest ownership structure and the relative steepness of the forest terrain. The third reason is the sharp decrease in the labor force in the mountain villages, particularly in the younger age groups. The fourth is the weak financing position of forestry in Japan. The fifth is that

Table 8.5. Sawn lumber/wood product price and logging wage changes in Japan, 1960–1982.

	Logging wage		*Sawn lumber/wood*	
Year	*Yen/day*	*Index A 1975=100*	*Index B 1975=100*	*A/B*
1960	648	11.2	39.1	28.6
1961	768	13.3	46.5	28.6
1962	936	16.2	47.2	34.3
1963	1000	17.3	48.3	35.8
1964	1108	19.1	48.7	39.2
1965	1220	21.1	48.1	43.9
1966	1384	23.9	51.3	46.6
1967	1586	27.4	55.6	49.3
1968	1865	32.2	58.8	54.8
1969	2039	35.2	61.4	57.3
1970	2394	41.3	65.4	63.1
1971	2681	46.3	63.7	72.7
1972	3038	52.5	70.8	74.2
1973	3718	64.2	102.0	62.9
1974	5256	90.8	107.7	84.3
1975	5790	100.0	100.0	100.0
1976	6395	110.4	107.8	102.4
1977	6749	116.6	112.1	104.0
1978	7269	125.5	107.9	86.0
1979	7775	134.3	133.2	100.8
1980	8550	147.7	149.6	101.3
1981	8763	151.3	132.9	113.8
1982	9183	158.6	136.6	116.1

the forest road network and timber-distribution structure are still relatively underdeveloped.

8.2.3. Third period: market domination by imported timber

After the so-called "oil crisis" in 1973, the entire world economy slowed down. Japan was no exception, and its continued high economic growth underwent a major change. The real annual growth of the GNP averaged approximately 3.2% between 1974 and 1982, i.e., less than one third of that in the previous period.

Against such a general economic trend, timber demand decreased from 113 million m^3 in 1974 to 96 million m^3 in 1975; and after that there was an increase (although slight), and demand reached 109.8 million m^3 in 1979. In 1981 demand dropped to less than 100 million m^3 (approaching 91.8 million m^3), and in 1982 it registered 90.2 million m^3.

What, then, was the trend in timber supply when the general economy and the demand for timber stagnated? Foreign timber supply increased and expanded its domination of the Japanese market. The reasons for such trends may be fairly described as being about the same as those in the earlier period.

The characteristics of foreign timber imports, compared with those in the preceding period, were the following. The first was that the import volume was affected by the economic slowdown and the decrease in demand during the period, but it still maintained about 65% share of the total supply. In other words, foreign timber was the principal source of Japanese timber supply.

The second characteristic, from the point of view of tree species, was that since 1973 there had been a rapid decline in the import volume of South Sea timber; but compared with this, the decrease in the import volume of North American timber was small, and in some years was considerably above the 1973 level. As a result, the share of North American timber in the total import volume gradually rose from 29% in 1973 to 35% in 1982, and continued to increase. Since 1973, although the rate of decrease has been generally proportionate to that of the total import volume (totalled with USSR timber, which had a 17% share in 1982), softwood timber, which accounted for 52% of the total timber supply, has a significant effect on the timber market, which mainly supplies the construction industry. Owing to this change in foreign timber imports, timber prices in Japan were dictated by the demand generated by the construction industry. Also, supply side was affected by the trend toward importing foreign timber, particularly from North America.

The third characteristic is the significant change in the tree species of imported North American timber. As already mentioned, these North American imports began to show an increase from 1961 onward, mostly in Western hemlock, which may be described as "ordinary" in quality. However, especially from the beginning of this period, good-quality large-diameter North American timber, used for beams, fixtures, and "surface" board, gradually began to be imported in large quantities. For example, if we consider imported North American logs in 1982, out of the total North American timber import

volume of 8.4 million m^3, Douglas fir had a 45% share, followed by Western hemlock with 38%, spruce with 7%, and *Abies* and *Picea* with 6%.

The reasons for this change were that the price of Western hemlock had become relatively higher, while in Japan the ordinary-quality timber resources had become more abundant; in addition, specialty timber was becoming scarcer in Japan.

The fourth characteristic is that the import share for wood products (sawn lumber, plywood, chip, and pulp) had increased. For instance, in 1960, out of the total foreign timber import volume of 7.5 million m^3, the share for sawn lumber and other timber was 12%; but in 1970 the same share was 23%, and in 1983 it was 45% (see *Table 8.1*). One reason, of course, was the efforts of the USA, Canada, and Southeast Asia to process their timber into lumber and to export it; but the principal foreign timber supplier countries established and enforced their export controls with greater strictness, which meant log export embargoes for most countries (*Table 8.6*).

Table 8.6. Timber export controls in principal timber exporting countries (Forestry Agency, 1984).

Country	*Applicable area*	*Controls*	*Start date*
USA	Federal forests west of long. 100° west, excl. Alaska	Log export prohibited. Substitute export from privately owned forests prohibited	1974
	Federal and state forests, excl. Alaska and Indian reservation forests	Red cedar embargo by stages, and embargo	1979
	Alaska state and federal forests	Log embargo	1928
	Alaska state forests	Prohibition of log shipments from state and export	1960
	Oregon state forests	Log embargo	1963
	California state forests	Log embargo. Substitution with state forest logs prohibited	1974
Canada	Entire British Columbia	Prohibition of log and chip shipment from outside of province	1906
Indonesia	Entire country	Trees of excellent quality (*Dalbergia Cochinchinensis*, etc.) and ramin log embargo	1978
	Entire country, excl. Irian and Java	Log export restriction and embargo	1981
	Entire country	Green veneer embargo	1982
	Irian and Java	Log export restriction	1982
Malaysia	Western Malaysia	Log embargo	1972
	Sabah	Log export restriction	1976
	Sarawak	Ramin log embargo	1980
Philippines	Entire country	Log embargo	1977 1982
Thailand	Entire country	Log embargo	1977
Brazil	Entire country	Log embargo	1973

The fifth characteristic is that, in response to the growth of sawn lumber import volumes, imports by container ships increased.

The sixth characteristic is that there has been a considerable withdrawal from timber production in the foreign timber producer countries by the major Japanese trading companies and the processing industry, particularly by the former. For example, prior to 1974, there were joint ventures of these trading companies with US corporations actively engaged in log production based upon the purchase of standing timber, but since 1974 such activities became almost nonexistent. Also, when imports of South Sea timber began, Japanese trading companies actively participated in the capitalization of the shipping companies in the producer areas, but such activities have also decreased.

The reasons for such trends may be explained by the increase in resource preservation in the producer countries, policies for encouraging the wood-processing industry, increasing the controls over log exports, the adoption of log-embargo policies, improvement in the shippers' capital position, and in Japan the slowdown in the demand for timber. As a consequence, in spite of sluggish economic growth, foreign timber imports still maintain the major share of Japan's timber supply, and their domination of the Japanese timber market has become even greater.

8.3. Current Situation of Timber Imports

We shall now consider recent trade trends in connection with South Sea, North American, and USSR timber imports, which are Japan's principal sources of foreign timber.

8.3.1. South Sea timber

Because Japan's source of South Sea timber was abundant and the resources were relatively close, imports initially came mainly from the island of Mindaneo in the Philippines (see *Table 8.7*).

In 1950 the Philippines had a 93% share of the total South Sea timber import volume, and 85% in 1957. After that, however, imports reflected the decrease in Philippine timber resources, and the main import sources shifted to Sabah, Sarawak, and Indonesia. Recently, however, due to Indonesia's aggressive export-restriction policy, the Sabah and Sarawak shares have increased and that of Indonesia decreased.

A review of Japan's import mechanism shows that, strictly speaking, there are differences by producer country, but generally the major Japanese trading companies purchase from the shippers in the foreign countries and sell to the dealers in Japan – a simple mechanism. The shippers in Sabah, for example, are a semi-governmental organization known as the Sabah Foundation, but otherwise private operators purchase concessions from the government and process timber for export in the form of logs. Currently, the average

Table 8.7. South Sea sources (%) of Japanese timber imports (including logs and sawn lumber).

Year	*Total volume* (1000 m^3)	*Philippines*	*Sabah*	*Sarawak*	*Indonesia*	*Others*
1950	119	93.3	6.7			
1957	1819	85.4	14.4		0.2	
1961	5549	68.7	29.6	1.0	0.1	0.6
1965	9333	60.2	29.9	6.5	1.6	1.8
1969	17814	46.7	22.7	11.4	15.3	3.9
1973	26969	23.2	26.3	4.5	42.0	4.0
1976	22388	8.7	37.6	7.4	43.3	3.0
1980	19656	6.9	31.7	11.1	45.9	4.4
1981	15493	10.3	36.0	18.4	29.9	5.4
1982	15865	10.2	40.5	24.8	18.6	5.9
1983	14853	6.1	43.5	27.7	16.7	6.0

export volume produced by the shippers in the producing areas is 3000–5000 m^3 per month, according to estimates.

The Japanese trading companies' procurement system is generally to establish an office in a foreign country or to station a representative there to purchase timber from the shippers in the respective countries. The quotation condition for South Sea timber is almost always FOB.

8.3.2. North American timber

At present, the North American timber import sources for Japan are the USA and Canada, and primarily from the Pacific Coast.

According to the 1984 import records, 1.31 million m^3 of logs and 0.18 million m^3 of sawn lumber (a total of 1.49 million m^3) were imported from Canada (sawn lumber was not converted to log volume, but calculated by simple addition). In the case of the USA, 6.84 million m^3 of logs and 0.93 million m^3 of sawn lumber (totaling 7.7 million m^3) were imported. As reported above, the imports from Canada come mainly from British Columbia; in the case of the USA, 71% of the total was imported from the state of Washington, 14% from Oregon, and 13% from Alaska.

If we review the distribution of timber and the trade of Washington and Oregon (the principal sources of imports for Japan), the result is as shown in *Figure 8.1*, and imports are conducted mainly between the trading company and the foreign corporation (in many cases the trading company's joint venture). Before 1973 the foreign corporation of the Japanese trading company (a joint venture) itself purchased the standing timber and produced the logs, but since 1973 there have been practically no such transactions.

We should note that about 60% of the North American timber trade volume to Japan is controlled by about ten major American forest owners/wood processors. Although such control is exercised in varying degrees, this may be

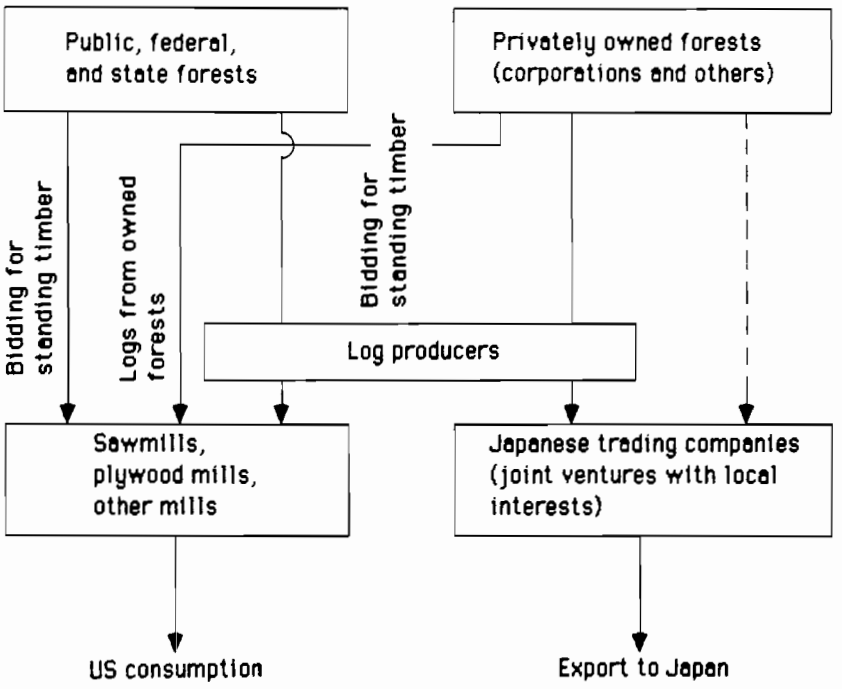

Figure 8.1. Timber distribution flow in the states of Washington and Oregon (broken line indicates small volumes).

considered to be the oligopolistic nature of the North American timber trade. Also, producer quotations are usually FOB for logs and C&F for sawn lumber.

8.3.3. USSR timber

The source of imports in the USSR is, of course, Siberia. As it is a socialist country, the forests are basically state-owned, and forest administration and timber production are supervised by the Ministry of Forests.

The trade procedures between the USSR and Japan are shown in *Figure 8.2* and are not necessarily simple. They may be divided roughly into four, which are Exportles (about a 57% share of the total timber import of 5.7 million m^3 from the USSR in 1980), Daljintorg (5%), K.S. Sangyo Co. (29%), and Czentrosojuz (7%). The first three are under the control of the Foreign Trade Ministry and are in the V/O Exportles Group, and the last is controlled by the Central Federation of National Consumers Cooperatives and is in the group of the All-USSR Cooperative Association Trade Corporation.

Trading with Exportles is based on the Trade and Payment Agreement between the Japanese government and the USSR, and usually this is what is meant by Japan–USSR trade. The transactions are conducted by the trading company in Japan and the V/O Exportles in the USSR, and the Japanese parties are not required to have any special qualifications. Exportles and the

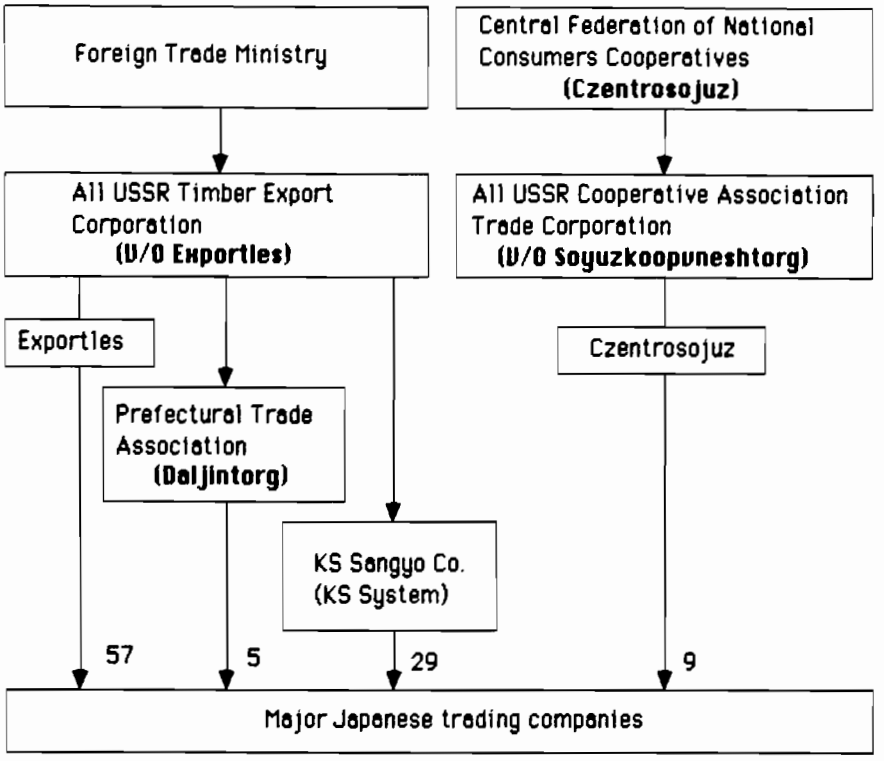

Figure 8.2. Trading routes for USSR timber (figures are percentage shares of timber imports from the USSR in 1980).

Japanese trading companies sign an agreement every fall on the volume to be purchased in the following year, and the prices are negotiated quarterly.

The Daljintorg transactions involve coastal trade of consumer goods between Japan and the USSR Far East [Irkutsk Province, Yakut ASSR (Autonomous Soviet Social Republic), and Buryat ASSR, as well as other regions]. The USSR encourages coastal trade and has opened a Daljintorg office in Nachodka. "Coastal trade" in the above sense does not mean that the prefectures on the Japan Sea coast have any special privileges; all Japan is regarded as being on the Japan Sea coast. If anyone on the Japanese side wishes to participate in coastal trade, there is no special qualification required, and no discrimination is made on account of geographical location. On the Japanese side, at present, local autonomies and prefectural trade associations (of which small and medium-size enterprises are members) serve as liaison members.

In coastal trade, barter is the basic rule, and Dalingtorg purchases goods from Japan to the extent of the payment received for the products sold to Japan.

At present, coastal trade is, on the whole, reported to be sluggish because there are such limitations as:

(1) Only the products of the Soviet Far East may be exported.
(2) The goods must be other than those handled by other USSR trading corporations.
(3) The products must be excess to the production quota set for the Far East enterprises or the provinces.
(4) In particular, the goods must be those that have been transferred from the general trading corporation, but few of them are attractive
(5) Because commissions must be paid to Exportles, the sawlog prices are believed to be about 10% higher than those procured through other trade channels.

During January–March of each year, Daljintorg gives information on the volume that may be imported during that year, and the prices are negotiated quarterly, based on the Exportles contract prices.

The "KS system" is based on the strong interest of both Japan and the USSR in the development of Soviet Siberia and the Far East. This is because the development and the export of the rich natural resources of Siberia and the Far East (and the great demand for equipment, machinery, materials, and consumer goods resulting from this development, of which a consideration portion is imported from Japan) is in the interest of both countries.

The economic cooperation against the backdrop of such interests by the two countries materialized in the form of the project resulting from the decision of the Japan–USSR Joint Economic Committee, becoming known as "the Project Trade," which continues to this day. The basic rule of the Project Trade is that both parties share the profits of trade. Japan supplies the equipment, machinery, and materials necessary for the development on a long-term, low-interest, deferred-payment basis, and receives a certain quantity of the resources developed on a long-term basis, and great hopes are held for exports from Japan. A part of the Project pertains to timber, and President Y. Kawai of Komatsu, Ltd and USSR's Sedov signed the agreement. The first letters of their last names have been used for the system, and it is commonly known as the "KS system". The Japanese signatory of the Project Agreement is K.S. Sangyo (KS Co.) and the USSR party is Exportles. K.S. Sangyo has the responsibility for monitoring the performance of the agreement, but the actual import procedures are handled by the trading companies.

Czentrosojuz is the foreign coordinator of Soviet cooperative associations, and Japan is mainly represented by cooperative associations. The major transaction items are Japanese timber imports, and exports consist principally of textiles and agricultural products, such as onions, garlic, apples, and tangerines. The agreements specify a barter trade, with the transactions conducted on an annual basis.

The present situation in every case is that the trading procedures are conducted principally by the trading companies because:

(1) Experience in trading procedures is required.
(2) Financial resources are needed.
(3) Well-established sales routes are necessary.

The present arrangement seems to be that in the case of Daljintorg the trading company pays a certain margin to the prefectural cooperative association; and with Czentrosojuz, to the organization in Japan that serves as the liaison (for example, the prefectures or the associations).

The quotation conditions for the USSR trade differ somewhat in the details, depending on the trade procedure, but generally they are CIF; little trading is conducted on an FOB base. In 1984, for example, out of the total export volume, 73% was CIF and 27% FOB.

8.4. Problems Faced by Japan in the Timber Trade

Now let us discuss some problems common to the entire timber trade, or more accurately, timber imports. First, there is the pressure on Japanese domestic forestry by foreign timber imports. As previously mentioned, since 1961, as a result of the sharp increase in timber imports, the domination of the market by foreign timber, the stagnation in demand for timber, rising labor costs, and the insufficient labor force have created difficulties in the cultivation of forests, forest planting, and cutting in Japan. From the post-World War II era to some time during the period of high economic growth, foreign timber was regarded as a powerful supplementary source for domestic timber; but now the two have become rivals for the same timber demand.

At present, Japan continues to have a large export surplus vis-à-vis the USA and Europe and thus has become the target of strong criticism. In particular, in April 1985 the USA, which has generated a $123 billion trade deficit, even passed a bill for retaliatory measures against Japan. Two reasons for the $37 billion trade deficit versus Japan are the high interest rate in the USA and the overvalued dollar. In the actual trade situation of Japan, which also continues to have a large export surplus, the Japanese must adopt some measures for a more positive opening of markets or expansion of imports.

This does not mean, however, that the tariff of the export surplus country should be completely eliminated as a means of correcting international trade imbalance. We do not intend to contradict the principles of free trade and to recommend protectionism. It must be recognized, however, that the demand for the advantages of free trade is legitimate only when the parties concerned are equal in economic strength.

As of late 1986, the Japan–US negotiations are focused on the liberalization of four sectors: electrocommunications, electronics, medical equipment, and timber. On the subject of timber, we are unable to say that the economic competitive power of Japanese forestry versus US forestry is strong. In fact, it is relatively weak. In addition, however, there are great demands by people to expand Japanese forests for contributions other than timber production, such as conservation of the land, retention of water resources, recreation, and purification of the air, all from the viewpoint of public welfare. Consequently, when there is stagnation in the timber demand, an increase in labor costs, and a decrease in the labor force, larger imports of foreign timber cannot be welcomed with open arms, at least from the viewpoint of Japan's internal problems.

Second, there is the problem of the politically motivated embargoes of South Sea log exports and North American timber. The current controls for South Sea and North American log exports have already been described. The producer countries' preference policy for exporting timber in the form of sawn lumber can be well understood. Nevertheless, the adoption of politically motivated controls over log exports, especially the sharp intensification as in the case of Indonesia has a significantly adverse effect on Japan's forestry, mainly in the wood-processing industry (especially plywood), which depends on foreign logs for its existence and which is not in competition with domestic forestry (which produces softwood).

Third, in the case of USSR timber imports, there is the problem of inexact measurement against the invoiced volume. The main reason for this is believed to be the inexperience of USSR scalers in the producing areas. It is reported, however, that the situation is recently gradually improving, as a result of complaints from Japan.

There is another problem in that the tree species and grades requested by the trading companies do not always arrive as specified from the USSR. It is reported that unavoidable circumstances relating to this problem exist in the USSR. That is, the Ezo spruce (*Picea jezonensis* Carr.) and white fir (*Abies sachalinensis* M.), which are in great demand by the importer companies, come mainly from the regions in the northern USSR Far East. Shipments cannot be made in winter and spring, when climate conditions are severe, and can only take place in the second half of the year. Consequently, during the first six months it is unavoidable that larch should predominate in the shipments from Nachodka, where it is relatively abundant. This is a major problem, however, for Japanese trading companies: timber consisting of the tree species and qualities in demand which sell well cannot be imported in sufficient quantities and at the right times.

Fourth, as already mentioned, there is the oligopolistic trend in the North American timber trade and production. The share held by the major American shippers of the log production shipped to Japan differs each year, but generally it is 40%–50% for the leading five companies, and about 60% for the leading ten companies. In the case of logs coming from the company-owned forests, the share for the latter is about 90%. Although there may be differences of opinion as to the degree of oligopoly, it must be admitted that it is considerable, and this has a dominant effect on timber prices and eventually on the timber market in Japan.

Fifth, South Sea timber is becoming smaller in diameter and the tree species more varied. There are now no reliable data on the available stocks of the useful large-diameter timber. It is certain, however, that the resources, mainly of *Dipterocarpaceae*, are decreasing at a very high rate. At the same time, the regions where these timber resources exist are rapidly becoming more difficult to reach because they are in remote areas, inconvenient for transportation facilities. The useful large-diameter trees are generally found as five or six to a one-hectare area, and are believed to be widely scattered in remote locations, causing an increase in production costs. If future demand

for such timber remains at the same level, or shows an increase, log prices will certainly rise.

Such a possibility of long-term log price increases will, it is anticipated, become a major disadvantage for the future imports of South Sea timber. There is a diversification noted in the imported tree species, in connection with the trend of exhaustion of these large-diameter South Sea timber, and this is believed to be the result of less efficient utilization of resources, anticipating an increasing decline in the South Sea timber trade.

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CHAPTER 9

Spain: Forest Product Trade Practices

Manuel Ruiz and Helen Groome

9.1. Introduction

In a country such as Spain, where a lack of certain important forest products leads to a structural deficit, forest policies concerning production and trade can be chosen from three alternatives (Florio, 1984):

(1) Imports of forest products with exports of other goods to cover the trade deficit.
(2) Imports of raw forest materials to be processed domestically, some of the finished products then being exported to cover the trade deficit.
(3) Government incentives for domestic wood production to supply domestic manufacturing industries.

In many cases, characteristics of all three policies may be identified in a country's trade practices. However, in Spain's particular case, the last two alternatives predominate, the third being historically the most important. Incentives promoting afforestation and the development of home industries date from the end of the nineteenth and the beginning of the twentieth century.

Full employment of the third alternative has taken place over the last four decades, as Spanish economic growth developed. The forest policy adopted centered on government aid to and protection of domestic wood production and manufacturing industries, implying subsidies, incentives, and trade barriers, the results of which are analyzed in this chapter. Also, the consequences of Spain's EEC membership are considered with regard to changes in forest policy and trade practices.

9.2. Evolution of Spain's Production and Trade in Forest Products

9.2.1. Production of raw materials

Spanish forest policy concerning domestic supply of certain forest products has, since the 1940s, placed emphasis on the production of low-quality woods for, above all, the paper industry and subsequently the fiber- and particle-board industries. Afforestation and reafforestation schemes have therefore focused on fast-growing species of *Pinus*, *Populus*, and *Eucalyptus*, which from 1940 to 1982 accounted for 95% of those hectares planted on state or public land or on private land with state aid. Native woodland suffered heavy felling and neglect, and products traditionally derived from these – cork, resin, charcoal, and certain hardwoods such as walnut, oak, and beech for the furniture industry – did not receive the same government aid and initiatives as the short-term rotation, often exotic species-derived products.

The consequence of such a policy is reflected in the growing output of timber as opposed to the declining production of the three major traditional primary forest materials: cork, resin, and firewood (*Table 9.1*). The result has been an increasing dominance of the contribution of timber production to the final forest product – growing from 45% of ts total in 1965 to 72% in 1983. The low quality of the timber produced has been reflected in its lower revaluation in the market as compared with other forest products, the relative increase in its volume being higher than its relative increase in value. Increasingly competitive prices help account for the higher outputs of firewood, resin, and cork registered in 1983.

Table 9.1. Production of timber, fuelwood, resin, and cork (Ministerio de Agricultura, 1965–1983).

	Timber (1000 m^3)	*Fuelwood*[a] (1000 m^3)	*Resin* (tons)	*Cork* (tons)
1965	5705	20255	46677	126192
1970	8627	12639	43083	109512
1975	11340	3979	38224	82497
1980	11892	1474	26374	75977
1983	11269	2669	20354	71613

[a]A change in definition in 1973 accounts for some of the 1970–1975 decrease.

9.2.2. Production of manufactured goods

Figure 9.1 shows the evolution of the output of the five groups of products considered: sawnwood and sleepers, cork manufactures, veneer sheets and wooden panels, pulp, and paper and paperboard. As can be seen, the latter three groups of products have greatly increased their output during the time period considered, showing sustained overall growth from the 1960s. The upward trends noted reflect the increasing availability of domestic raw

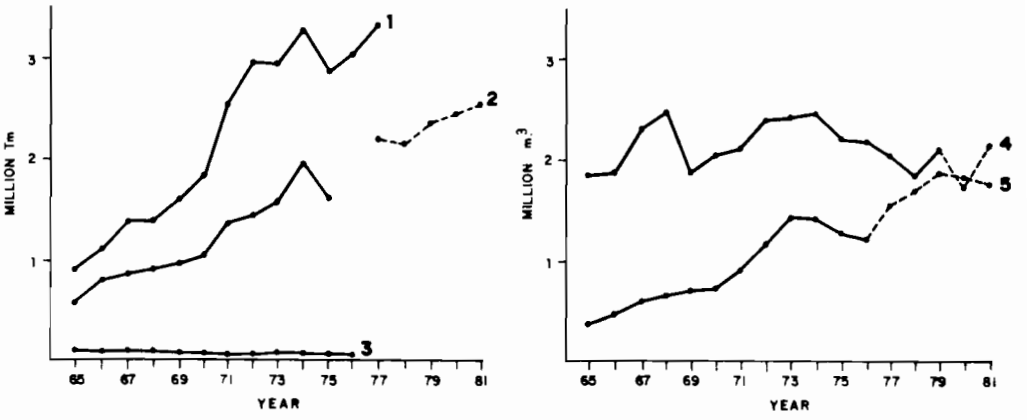

Figure 9.1. Production of manufactured forest products: 1, paper and paperboard; 2, pulp; 3, cork manufactures; 4, sawnwood and sleepers; 5, veneer and wooden panels (Groome and Ruiz, 1984). (The lack of officially available reliable statistics accounts for the unfinished appearance of this figure. Official estimates for the years 1975–1984 are currently being processed.)

materials for their manufacturing industries, which, as will be shown later, was mainly the result of government aid to these sectors. The Spanish paper industry has specialized in certain types of papers, usually those of lower quality (paper for wrapping and packaging, for example). At the same time the cork and sawnwood industries show a fluctuating but overall stagnant position.

9.2.3. Forest product trade

At a global level Spain's forest product commerce has greatly increased over time in terms of both imports and exports. In 1965 the sector suffered from a deficit of 6074 million pesetas (in constant 1970 prices), but high export growth resulting from government incentives to domestic wood production transformed Spain into a net exporter of forest products in 1983 with a surplus of 156.5 million constant pesetas. As a result, the monetary coverage rose from 28.6% in 1965 to 101% in 1983.

Within the sector, however, trade evolution has varied greatly from product to product, as can be seen in *Table 9.2.* This is seen most clearly in exports where paper and paperboard have increasingly dominated the sector, their percentage of the total value of forest product exports rising from 9.0% in 1965 to 41.9% in 1983. Pulps have also become increasingly important (2.0% to 16.7%), as have veneers and wooden panels (4.3% to 12.4%). Again it is traditional products that have lost their relative importance, although exports of cork, fuel, firewood, and charcoal have also increased over time.

Of imports those products predominating are pulp, higher quality papers, and paperboard, which together accounted for 57.1% of total forest product imports in 1983. The relatively insignificant nature of other products is clear, apart from roundwood, the imports of which are composed mainly of tropical

Table 9.2. Imports and exports (million current pesetas) of forest products (Ministerio de Economía y Hacienda, 1965–1983).

Product	*1965*	*1970*	*1975*	*1980*	*1982*	*1983*
Roundwood						
Imports	650.3	2553.7	4495.6	13924.2	7065.3	10685.3
Exports	13.0	123.9	233.4	606.3	843.1	961.7
Fuelwood and charcoal						
Imports	0.4	6.5	24.1	344.6	407.2	346.3
Exports	10.3	122.1	170.3	708.2	1466.4	2233.7
Sawnwood and sleepers						
Imports	2610.4	4137.5	8156.8	23816.8	21788.8	27743.2
Exports	434.4	1262.3	2534.9	7691.1	13691.9	17431.3
Veneer and wooden panels						
Imports	74.5	233.0	360.8	976.1	1309.8	1398.3
Exports	82.1	419.6	985.2	7344.0	8349.6	12151.4
Cork and manufactures						
Imports	8.6	29.8	81.5	119.5	166.9	318.8
Exports	953.6	1258.5	2176.9	5730.0	5270.2	6342.6
Wickerwork						
Imports	23.9	63.4	279.5	683.2	804.2	1035.4
Exports	200.7	237.9	507.0	1047.1	1156.5	1351.8
Pulp making materials						
Imports	1697.8	3866.4	8594.5	14203.9	17695.3	19221.2
Exports	38.0	264.9	1353.4	6186.7	7863.7	16267.3
Paper and paperboard						
Imports	1590.6	3723.7	8915.6	22040.4	35228.5	35968.4
Exports	171.6	1078.3	5363.6	21775.1	31955.7	40931.5
TOTALS						
Imports	6647.5	14604.0	30908.4	76108.7	84466.0	96718.1
Exports	1903.7	4767.5	13324.7	51088.5	70597.1	97671.3

and subtropical timbers necessary for the veneer and furniture industries. Increasing attempts at industrialization within the tropical and subtropical countries have not yet influenced their exports to Spain, few of the more highly processed forest product imports of which are derived from these countries. However, in the near future such industrialization will affect Spain's veneer and furniture industries, the hardwood needs of which being derived from tropical and subtropical countries. Limitations of raw material exports by these countries will negatively affect Spain's panel industry, which employs veneers as part of its final product, and the furniture industry, which has already called for changes in government afforestation policies to promote native hardwood species (Ministerio de Industria, 1981; García-Franco, 1982).

9.2.4. Source and destination in Spanish forest product trade

Figure 9.2 shows the participation of each regional grouping of countries in Spain's forest product trade, these groupings – Nordic, EEC (ten members), tropical/subtropical and others – having been defined with geographical and economic factors in mind. Of most importance is the increasingly concentrated nature of Spain's exports, above all to the EEC, which accounted for 64.1% of all exports in 1983, while imports are derived from an increasingly balanced spread of countries. Naturally this also varies from product to product. Therefore, while 81.1% of all roundwood imports originated in tropical or subtropical countries in 1983, sawnwood imports were more equally divided between the four country groupings, ranging from 23.7% from EEC countries to 25.7% from Nordic countries.

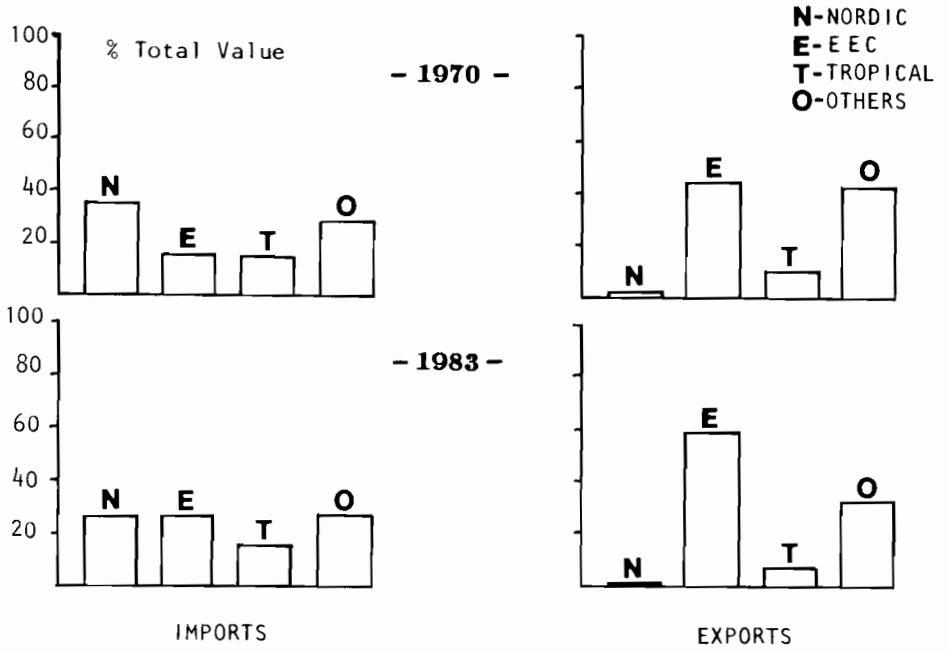

Figure 9.2 Shares of the regions in Spain's forest product trade (Ministerio de Economía y Hacienda, 1970 and 1983).

The overall dominance of the EEC in Spain's forest product export markets is reflected in all subsectors apart from roundwood, cork, and its manufactures. This is a result not only of its proximity but also, to a certain extent, of the preferential agreement affecting tariffs for forest products. Spain's integration into the trading bloc will modify the situation observed. It is also important to note that Spain maintains a surplus trade relation with the EEC group of countries (of +14526.7 million pesetas) and "other" countries (+1881.6 million pesetas), having a deficit with the other two groups. Within

"other" countries Spain's major export market is the group of Arab nations, which accounted for 45.1% of all exports to other countries in 1983, reflecting Spain's good trading relations with Arab countries in general. The country's monetary coverage with all four country groups increased substantially from 1970 to 1983.

9.3. Tariffs, Subsidies, and Incentives Affecting Trade

Spain employs a number of measures that affect free trade in forest products. These aim both to protect and promote home production of raw materials and manufacturing industry and to enhance the competitive nature of Spain's exports. The result, as has been seen, is an increase in the monetary coverage and a gradual lowering of Spain's deficit in forest product trade until a surplus was achieved in 1983. These measures can be classified into two major groups: import tariffs and nontariff measures such as export subsidies, production incentives, and information and technical aid, which affect trade both directly and indirectly (Ferguson and Lloyd, 1980). On the other hand, Spanish exports face a number of tariffs and protective measures, also distorting free trade in forest products.

9.3.1. Incentives for plantation and production

Incentives for production in Spain focus on raw material production through subsidies and credits for afforestation and reafforestation schemes. The most recent stem from the 1968 and 1977 Government Orders entitled "Aids to Forest Enterprises", the 1977 Law "Promoting Forest Production", and the 1982 Order "Promoting Poplar Plantations". These all place emphasis on fast-growing species, thereby ensuring supplies of raw materials for the pulp, paper, and panel industries. Government aid to those undertaking afforestation currently takes the form of a subsidy of up to 50% of a plantation scheme's budget.

With the current development of a decentralized forest administration system, owing to the introduction of a greater degree of autonomous government within the Spanish state, these blanket subsidies are being replaced by varying regional incentive policies. These often represent an important change in forest policy, favoring the promotion and regeneration of natural species. For example, in the Basque country, subsidies for native species may cover 85% of costs, while those for fast-growing species only receive subsidies of up to 20%.

The fact that the vast majority of plantation schemes undertaken have employed fast-growing species reflects two points: first, the dominant position of the paper industry and its raw material requirements; and second, the failure of the administration to adequately promote hardwood plantations. Government aid to these on private land has not sufficiently overcome the long-term nature of the undertaking and does not provide incentive enough to

cover the low and unsure returns on capital investment. Faced with the choice between similar subsidies for fast-growing species versus better quality but slow-growing species, the private owner has opted for quick-rotation crops, resulting in earlier returns on capital outlay.

However, neither has the administration itself undertaken to plant hardwoods, despite admitting the "social" role such woodlands play (soil protection, water conservation, multiple land use in marginal areas, etc.) and the fact that sufficient economic arguments exist to support the undertaking, the already-mentioned demands of the furniture industry for home supplies of hardwoods to cover future world shortages being but one. The fact that 91% of state-linked plantations have been monocultures of pine and eucalyptus reflect once again the emphasis of forest policy on the production of raw materials for the paper industry in particular, with clear implications for trade in its products.

Government subsidies not only cover seeding and planting but also provide aid for forest ride and firebreak construction, terracing, technical and managerial plan formation, and may even subsidize fire-insurance schemes. A state service for extinguishing fires covers all forest property, an important factor in Spain, where the accumulation of pine needles and eucalyptus leaves is a highly potential fire risk, and enhances that already in existence due to the Mediterranean climate dominant in much of Spain's territory.

In addition, official credits are made available, preference again being given to afforestation schemes employing high-yielding species. In total, subsidies and credits can reach 90% of plantation-scheme costs.

Aid to industries dates back to the beginning of the century. The 1928 Royal Decree providing protection to the paper industries gave government financial aid, which, apart from aiding exports, was used to buy machinery and to help in the production of books, journals, and newspapers, all end products of the paper industry. Since then there has been increasing state intervention in forest product industries, with, for example, the creation of the Timber Service in 1948, which regulated the forest product market. The most profound intervention has taken place, however, in the paper industries, the National Institute of Industry controlling some of the most important pulp and paper enterprises.

9.3.2. Import tariffs

With regard to import tariffs, Spain maintains a system of general levies and preferential levies. These are calculated as a percentage of each product's value on arrival at Spanish customs, with the value of home-produced goods as a reference. General tariffs therefore refer to these percentages. Preferential tariffs are conferred on certain trading groups, such as the EEC and EFTA, and to certain countries with special trading agreements. The cost of these is paid by Spanish importers. Additionally a general "tax" is imposed, affecting all countries; this is calculated on the value of imported goods, plus the percentage added by the corresponding tariff, and its stated purpose is

"to provide equal financial treatment of both imported and nationally produced goods" (EMADA, 1983/1984).

The majority of forest products imported by Spain are affected by import tariffs, which vary up to 24.6% of value. Those tariffs corresponding to Spain's major imports of forest products are summarized in *Table 9.3*. In general the lowest tariffs are applied to imports of certain raw materials or products serving as inputs to other industries such as waste paper for papermaking. Conversely, the highest tariffs correspond to finished products with a higher value added, such as certain types of paper. This reflects adoption of policy alternative (2), outlined in the introduction of this chapter. It is interesting to note that no preferential tariff treatment is given to imports of paper from the EEC, which account for 40.4% of all Spanish paper imports. This represents, once again, the deliberate protection afforded to Spain's major forest industry, the paper manufacturing business. The common tax additionally applied by Spanish customs follows the same trend as that noted for the general tariff, an increase from low to highly processed products, and ranges from 2% to 14%. Combining tariff and tax shows that total nominal protection ranges from 3% to 33% for forest products in Spain.

Table 9.3 General and preferential import tariffs in Spain (EMADA, 1983/1984).

Product	*Imports* (10^6 ptas)	*% of total imports*	*General tariff* (%)	*Preferential tariff* (%)		*Common tax* (%)
				EEC	*EFTA*	
Roundwood	7.063	8.4	1.8–11.1	1.3–7.0	1.3–7.0	2–6
Sawnwood	19.550	23.1	0.9–14.0	0.7–9.0	0.7–9.0	2–7
Paper pulp	14.634	17.3	3.6–7.3	2.7–5.5	2.7–5.5	8.5
Waste paper	3.062	3.6	0.9–6.4	0.7–4.8	0.7–4.8	3.5
Paper and paperboard	19.102	22.6	6.4–15.2	6.4–15.2	3.2–11.5	14.0
Coated papers	11.408	13.5	0.9–16.5	0.9–16.5	0.7–13.3	14.0
Other papers	1.265	1.5	5.5–17.3	5.5–17.3	4.4–13.8	13.5

9.3.3. Nontariff measures

With regard to nontariff measures affecting trade, the government employs an official system of export subsidies. These are calculated as a percentage of the declared value of a given product at customs plus any tariff such a product would have paid had it been imported. These benefit the majority of Spain's forest products, which are also subject to licensing and inspection laws. Such subsidies range from 1.3% to 12.5%.

Table 9.4 includes those subsidies given to major export products. Government policy clearly reflects policy alternative (3), as the highest subsidies are given to paper products, already benefiting from production incentives for low-quality wood and protected home markets due to high import barriers. It can be argued, in fact, that these exports rely on such subsidies to

Table 9.4. Export subsidies benefiting Spanish forest products and tariffs affecting those exported to the EEC, 1982 (EMADA, 1983/1984; European Communities, 1982).

Product	*Exports in 1982* (10^6 ptas)	*% of total*	*Subsidy* (%)	*Common customs tariff*	*Spanish preferential tariff*
Charcoal	1459	2.1	3.5	–	–
Sawnwood	2532	3.6	2.0–5.5	0.0–4.6	0.0–1.8
Fiberboard	1901	2.7	8.5	10.6	4.2
Veneer and plywood	2437	3.45	7.5	11.9	4.7
"Artificial" wood	3223	4.56	7.5	11.3	4.5
Boxes, cages	4730	6.7	7.5	9.1–11.6	3.6–4.6
Carpentry goods	2312	3.3	7.5	5.0–11.6	2.0–4.6
Marquetry	1504	2.1	7.5	6.4–10.6	2.5–4.2
Natural cork	1848	2.6	1.3	2.8	2.8
Cork manufactures	1229	1.7	8.1–8.9	13.0	13.0
Agglomerated cork	2139	3.0	8.5	11.0–13.0	11.0–13.0
Paper pulp	7483	10.6	5.9–7.0	–	–
Paper and paperboard	10622	15.0	12.5	2.8–10.9	1.1–4.3
Coated paper	9609	13.6	12.5	8.9–11.9	3.5–4.7
Decorating paper	1507	2.1	12.0	10.8	4.3
Other papers	1355	1.9	12.0	5.8–10.9	2.3–4.3
Cardboard boxes, paper sacks	4906	6.9	11.0	12.9–13.9	5.1–5.5

be able to compete in foreign markets. *Figure 9.3* shows that for certain papers and pulps, the price of production is higher than that of either imports or exports. As in most countries, Spanish exporters benefit from governmental aid in the form of market, technical, and red-tape information. The Spanish government agency concerned, the National Institute for the Promotion of Exports, maintains delegations in many regions of Spain and also in many foreign countries, and provides a wide range of aid from the setting up of export consortiums to the provision of venues for export products in international fairs.

With reference to the paper industry it should also be noted that a system of import aid exists whereby the achievement of a given level of exports qualifies a firm to certain essential import licences, thereby facilitating the acquisition of necessary raw materials.

Spanish exports also face trade barriers. The EEC, Spain's major export market, imposes a Common Customs Tariff on a range of forest products, some of which are noted in *Table 9.4*. The EEC grants preferential treatment to a number of countries and signed a preferential agreement with Spain in 1970, now to be eliminated owing to Spain's integration in the Common Market. It should be noted, however, that until the introduction of new EEC regulations in 1982 homogenizing preferential tariffs, those granted to Spain for forest products were generally the highest amongst beneficiary countries; this may be interpreted as a measure by the EEC to prevent possible dumping by Spain, which could result from the subsidies and incentives given to its domestic industry to make it more competitive in external markets.

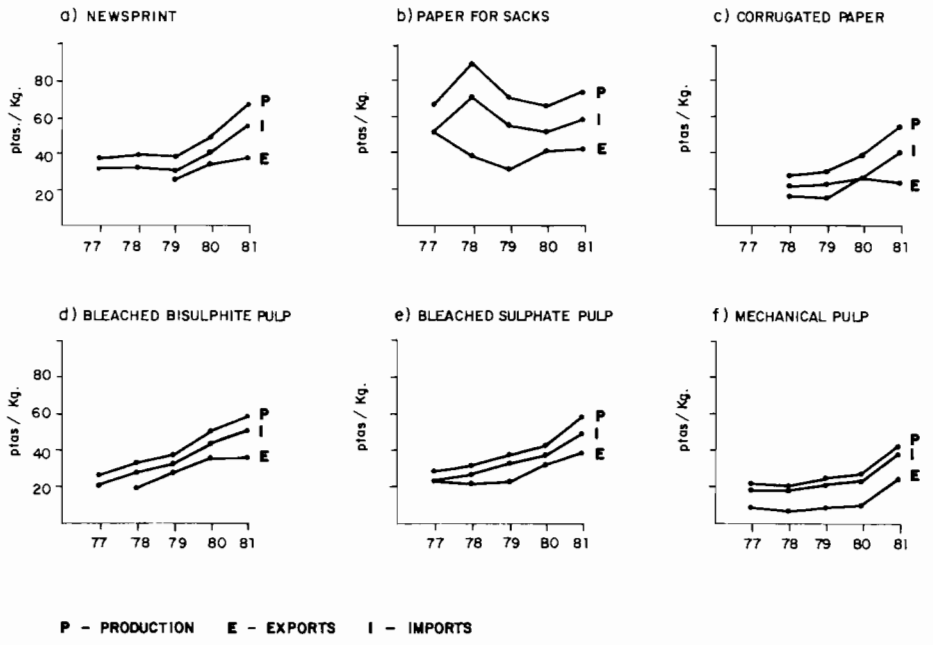

Figure 9.3 Production, import, and export prices of a selection of paper products and pulps (Ingeniera Química SA, 1982).

Following similar trends of Spanish import tariffs, the more highly processed goods receive the highest tariffs, thereby creating difficulties, for example, for Spanish exports of wooden panels, paper goods, and manufactured cork products to the EEC. Conversely, the EEC maintains no tariff against pulp imports, thereby facilitating imports of those materials necessary for its paper industries, while reducing the need for internal production, a highly polluting process.

9.4. Possible Changes in Spanish Trade Practices Consequent upon EEC Membership

A major change in Spain's trade practices is foreseen as a consequence of its entry to the EEC in January 1986. Full EEC membership entails adaptation of Spain's trade protection measures to those currently employed by the Community.

In terms of forest products Spain's trade has become increasingly oriented toward the EEC. Bearing in mind the tariff patterns noted, entry to the EEC will have important direct and indirect effects (Brotons, 1979). The direct effects will stem from the removal of trade barriers according to specific agreements, which will expose and prove disadvantageous to Spain's weaker forest product manufacturing industries, or, in other words, those requiring and receiving most protection. Among these are the paper and

paper product businesses, already uncompetitive and rarely functioning at their full capacity. These are also the industries that have expressed their concern at the programmed withdrawal of export subsidies and the application of a value added tax, introduced in January 1986. In order to cope with the new situation and to exert pressure on the government in the field of forest policy and forest industries, associations of pulp and paper and related industries have been formed (such as the Asociacion para el Progreso Forestal or the Asociacion de Forestalistas del Pais Vasco), although their capacity to influence the government remains to be seen.

Other industries such as cork, charcoal, and furniture manufacturing could benefit from EEC membership, especially if given appropriate government support consistent with general EEC policy. This is the case owing to Spain's high potential in providing necessary raw materials such as cork and high-energy wood products, plus its advantageous position in the furniture industry due to innovative practices, quality artisan work and design, and a high level of technical know-how.

The major indirect effects of Spain's entry to the EEC would be the foreseeable changes in land use, releasing certain marginal areas for silvicultural purposes (Ruiz, 1985). The effect on forest industries will depend on the nature of the afforestation schemes implemented. Additionally, measures such as adaptation to EEC environmental regulations would result in higher production costs in certain industries, such as the highly polluting pulp manufacturing industry.

The development of a Common Forest Policy (CFP) would have further implications given that, currently, member countries may develop their own tax subsidies, plantation initiatives, and market information systems within the forest sector. Should a CFP be developed, as has been proposed on various occasions (for example, Gatto, 1983), such internal policies would have to be homogenized, as occurs, if imperfectly, with the Common Agricultural Policy. This could affect Spain's production subsidies, credits, and other incentives, with repercussions for its output, trade, and trade practices. The implementation of a rational CFP should result in specialization within Spain in Mediterranean forest products, thereby drastically changing the contemporary forest panorama.

9.5. Conclusions

In the past Spanish forest product trade has been determined by a forest policy oriented toward domestic production, manufacturing industries, and market protection through incentives, subsidies, and tariffs. The present situation shows a marked concentration in the production and exports of certain products: panels, pulps, and paper, and specialization within the paper industry towards lower-quality products. At the same time, traditional products have been neglected. Exports are currently highly concentrated toward the EEC market.

In the future Spanish forest policy and trade practices will change due to EEC membership, developments in internal forest administration organization, and future world shortages of certain forest products. The present is therefore critical for the Spanish forest sector, a possible future development being a more rational policy, reducing the domination of the paper industries, and promoting furniture and traditional Mediterranean forest products.

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CHAPTER 10

Sweden: Its Forest Industries in the World Market

Arne M. Anderson and Olle Ohlsson

10.1. Introduction

Sweden is one of the world's large producers of forest products. Its forests cover an area of approximately 23.5 million hectares and the rate of growth is about 85 million m^3 per year. The raw material from the forests goes to two processing sectors, the wood-processing industry and the pulp and paper industries.

In the early 1980s, the Swedish forestry sector employed 50 000 people, the Swedish wood-processing industries 25 000, and the pulp and paper industries 43 000. Although the Swedish forestry and forest industries employed less than 3% of the total labor force, they accounted for 19% of the value of total Swedish exports in 1982.

In this chapter we start by describing the capacities, output, and exports of the Swedish forest industries in relation to international conditions. During the 1970s there were considerable structural changes within the forest industries caused by, *inter alia*, technical development and cyclical fluctuations. Important changes in tariffs and barriers have also taken place during the same period. Against this background we analyze the market conduct of the Swedish producers – cooperation, price setting, and production differentiation.

10.2. Swedish Forestry

Some 50% of Swedish forests are owned by private parties, 25% by the forest industries, and the remaining 25% by the state and church. The size of the

fellings since the mid-1970s, according to the *Statistical Yearbook of Forestry* (1980, 1984), is shown below:

1975–1976	66.7 million m^3
1976–1977	56.0
1977–1978	57.1
1979–1980	58.9
1980–1981	60.5
1981–1982	61.5
1982–1983	65.9

As can be seen from the list, the annual fellings are well below the annual growth of the forests (85 million m^3). During the same period, the Swedish forest industries imported an increasing share of their timber needs from the world market. In spite of these imports some factories suffered acute shortages of timber, which negatively affected the capacity utilization of the industries for the period.

The insufficient fellings in the Swedish forests result from several factors. Too many small forest properties have more than one owner, which complicates felling decisions. It is difficult for these owners to come to a decision concerning the "right" point in time for felling, *inter alia* due to the country's tax system. Another reason for the inelastic timber supply is expectations concerning future timber prices.

10.3. Production and Export

10.3.1. The sawmill industry

The forest industries are usually divided into two subgroups. The first consists of the sawmill industry (including planing mills and wood-preservation plants), the veneer and plywood industries, and the particleboard mills. The second subgroup consists of the pulp and paper industries. In the first subgroup the sawmill industry is totally dominant in Sweden. The value added of the sawmill industry is about six times larger than the sum of that of the remaining industries of this subgroup. From the export point of view, the sawmills are even more dominant; in 1982 the sawmill industry accounted for 94% of the total value of the exports from this subgroup. Therefore among the industries of the first subgroup we will concentrate in this chapter on the sawmill industry.

In 1983 Sweden was second after Canada among the exporters of sawn softwood. *Table 10.1* shows Swedish production, imports, and exports of sawn and planed softwood for the years 1974, 1978, and 1983 (Official Statistics of Sweden – *Foreign Trade*, 1974, 1978, 1983; *Manufacturing*, 1974, 1978, 1983).

From *Table 10.1*, it can be seen that 1974 was a peak year for the Swedish sawmill industry. In general the export share of production is high but fluctuates considerably. During the last few years, this share has been more than 70%. The composition of the export of the most important products is shown in *Table 10.2*.

Table 10.1. Swedish production, imports, and exports (1000 m^3) of sawn and planed softwood in 1974, 1978, and 1983 (Official Statistics of Sweden – *Foreign Trade*, 1974, 1978, 1983; *Manufacturing*, 1974, 1978, 1983).

Year	*Production*	*Imports*	*Exports*	*Exports as % of production*
1974	14 008	82	7 389	53
1978	10 885	145	6 782	64
1983	11 544	60	8 444	73

Table 10.2. Swedish exports (1000 m^3) of sawn timber, planed timber, and rafters in 1974, 1978 and 1983 (sources as in *Table 10.1*).

Year	*Sawn timber*	*Planed timber*	*Rafters*	*Total*
1974	6 733	407	249	7 389
1978	5 910	672	200	6 782
1983	7 224	1 081	139	8 444

The largest export product is sawn timber, with 85% of exports. From 1974 to 1983 exports of planed timber more than doubled. Of Swedish exports of wood products in 1983, 25% went to Britain, 14% to West Germany, and 10% each to the Netherlands and Denmark. In 1983 Sweden supplied 65% of Denmark's imports of sawn softwood, 38% of the Netherlands', and 30% of both West Germany's and Britain's. In spite of decreasing imports in Great Britain, Denmark, and West Germany during the last few years, Sweden has increased its market shares in those countries. The most important buyers of sawn softwood are the building construction and wood-processing industries.

Even though the majority of Swedish exports are directed to West Europe the importance of the non-European markets is gradually increasing. The share of Swedish sawn softwood exports to these markets has increased from 2% in 1970 to 17% in 1981. The most important of these new markets are Egypt and Saudi Arabia, and the decline in West European timber consumption will probably result in increasing exports to them.

10.3.2. The chemical and mechanical wood pulp industries

Between 1972 and 1982 world capacity of pulp production increased on average by 2.2% per year. The Swedish capacity of *chemical and mechanical wood pulp* production has been almost constant – approximately 10 million tons per

year – for the last decade. However, the market for pulp has decreased steadily during the period, and it was slightly less than 4 million tons per year by 1983. The output capacity of pulp for use in integrated paper mills has increased correspondingly and amounted to 5.5 million tons in 1983.

In 1981 Sweden was fifth among the pulp-producing countries, after the USA, Canada, the USSR, and Japan (32% of Swedish pulp production was exported). *Table 10.3* shows Swedish production of chemical and mechanical wood pulp during the last decade.

Since 1974 the production of pulp has concentrated on three main products: bleached sulfate, unbleached sulfate, and mechanical pulp. In 1983 their share of the total pulp production amounted to 89%.

Bleached sulfate dominated exports and has increased its share of total pulp exports from 48% to 66% during the last decade. Mechanical pulp has maintained its share of total pulp exports during this period. In 1983 approximately 25% of the total imports of pulp to Western Europe came from Sweden, and Sweden and Canada are the biggest exporters to this area (see *Table 10.4*).

Table 10.3. Swedish production (1 000 tons) of chemical and mechanical wood pulp in 1974, 1978, and 1983 (Annual Statements of the Swedish Pulp and Paper Association, 1974, 1879, 1983).

	1974		*1978*		*1983*	
Product	*Volume*	*%*	*Volume*	*%*	*Volume*	*%*
Mechanical pulp	1 930	20	1 748	20	1 964	23
Semi-chemical pulp	403	4	351	4	234	3
Dissolving pulp	293	3	231	3	75	1
Bleached sulfite	913	9	635	7	533	6
Unbleached sulfite	732	8	374	4	220	2
Bleached sulfate	2 968	30	2 945	35	3 384	39
Unbleached sulfate	2 532	26	2 273	27	2 255	26
Total wood pulp	9 771	100	8 557	100	8 668	100

Table 10.4. Swedish exports (1 000 tons) of chemical and mechanical wood pulp in 1974, 1978, and 1983 (sources as in *Table 10.3*).

	1974		*1978*		*1983*	
Product	*Volume*	*%*	*Volume*	*%*	*Volume*	*%*
Mechanical pulp	527	12	387	10	378	12
Semi-chemical pulp	20	0	25	1	–	–
Dissolving pulp	253	6	205	5	57	2
Bleached sulfite	566	12	447	11	317	10
Unbleached sulfite	302	7	120	3	45	2
Bleached sulfate	2 194	48	2 264	57	2 029	66
Unbleached sulfate	701	15	523	13	253	8
Total wood pulp	4 563	100	3 971	100	3 079	100

More than half of Swedish pulp exports are bound for West Germany, Britain, France, and Italy; and the most important market for this pulp is West Germany, which takes 23%. The Swedish share of imports of pulp to the EEC area decreased significantly during the 1970s. On the other hand, Canada, the United States, and Brazil have increased their market share in the EEC. Sweden has partly compensated for this reduced market share by increased exports to Eastern Europe, and since 1983 it has recaptured some of its share of the EEC market.

10.3.3. The paper and board industries

Sweden was sixth among the paper- and board-producing countries in 1981 after the United States, Japan, Canada, the Soviet Union, and West Germany. During the 1970s the Swedish output capacity for *paper and board* increased by 4% per year. Between 1980 and 1982 its capacity was roughly constant, and in 1983 the output capacity for paper and board amounted to 7.1 million tons per year. The Swedish paper and board industry has generally adapted to the development of international consumption.

Table 10.5 shows Swedish production of paper and board during the last decade, 75% of which is exported, and *Table 10.6* shows the country's export of paper and board in 1974, 1978, and 1983.

Table 10.5. Swedish production (1000 tons) of paper and board in 1974, 1978, and 1983 (sources as in *Table 10.3*).

	1974		*1978*		*1983*	
Product	*Volume*	*%*	*Volume*	*%*	*Volume*	*%*
Paper subtotal	4071	74	3940	69	4081	64
Newsprint	1210	22	1258	22	1349	21
Magazine paper	408	7	367	6	417	7
Kraft paper	1269	23	1074	19	995	16
Tissue	171	3	207	4	257	4
Sulfite paper	58	1	23	0	8	0
Greaseproof	29	1	20	0	27	0
Fine paper	479	9	557	10	704	11
Other paper	447	8	434	8	324	5
Board subtotal	1439	26	1762	31	2269	36
Kraft liner	706	13	921	16	1181	19
Other board	733	13	841	15	1088	17
Total paper and board	5510	100	5702	100	6350	100

During the last decade Swedish production and export of *paper* have remained constant. The most important paper products are newsprint and kraft paper. The share of newsprint production has increased somewhat, while that of kraft paper has decreased by 7%. Exports of kraft paper have decreased considerably. Of the Swedish paper and board exports, 72% has

Table 10.6. Swedish exports (1000 tons) of paper and board in 1974, 1978, and 1983 (sources as in *Table 10.3*).

	1974		*1978*		*1983*	
Product	*Volume*	*%*	*Volume*	*%*	*Volume*	*%*
Paper subtotal	2820	73	2852	66	2919	62
Newsprint	895	23	989	23	1062	23
Magazine paper	265	7	213	5	244	5
Kraft paper	1033	27	904	21	799	17
Tissue	54	1	76	2	112	2
Sulfite paper	45	1	20	1	6	0
Greaseproof	22	1	16	0	24	1
Fine paper	253	7	346	8	468	10
Other paper	253	7	288	7	204	4
Board subtotal	1029	27	1470	34	1787	38
Kraft liner	568	15	898	21	981	21
Other board	461	12	572	13	806	17
Total paper and board	3849	100	4322	100	4706	100

gone to the EEC and 11% to Asia. Sweden and Finland are the biggest exporters of newsprint in Europe. The market shares of Finland and Sweden are 33% and 29%, respectively.

During this period *board production* increased by 58% and the export of board by 74%. Sweden is, after the USA, the largest exporter of kraft liner in the world (7% of the world's consumption). In Western Europe, Sweden is the market leader, with 33% of the area's consumption.

Table 10.7 shows the three largest importing countries of paper and board from Sweden in relation to their consumption and imports from other countries. As can be seen, since 1972 Sweden has lost some share of the market in the three most important buying countries.

Table 10.7. Production of paper and board in West Germany, France, and Britain compared with Swedish deliveries (sources as in *Table 10.3*).

Destination	*Year*	*Domestic production (DP)* (1 000 tons)	*Swedish deliveries (SD)* (1 000 tons)	*SD compared with DP* (%)	*SD compared with total imports* (%)
West Germany	1972	5 850	640	10.9	21.4
	1980	7 500	810	10.8	21.5
	1982	7 800	760	9.7	20.5
France	1972	4 530	330	7.3	24.4
	1980	5 150	500	9.7	23.2
	1982	5 100	500	9.8	21.9
Britain	1972	4 340	730	16.8	23.9
	1980	3 800	760	20.0	22.3
	1982	3 200	870	27.7	21.4

10.4. Tariffs and Barriers

As mentioned above, the most important markets for Swedish forest products are the EEC countries. Tariff barriers are almost unimportant for Swedish exports of *sawnwood products*, and Swedish exports of *wood pulp* to the EEC countries have been free from tariffs during the period 1974–1983. The tariffs on Swedish *paper and board* exports to the EEC have gradually been reduced. For most types of paper the tariff was 12% when the cuts started in 1973, and from January 1984 onward Swedish exports of *paper* to the EEC have been free of tariffs. Newsprint, however, was in practice free of duty during the entire period by means of a system of duty-free quotas.

Beginning in the 1980s a gradual reduction in tariff barriers has been implemented among the leading industrial nations of the GATT. The GATT agreement implies that Swedish exports to the USA, Canada, Japan, and other countries will be subject to considerable tariff cuts. However, the tariff cuts on Swedish paper exports have been less than the average for industrial goods.

10.5. Structure and Cost Conditions

Swedish forestry corporations are small compared with those of North America. Of the ten largest corporations in the world (by turnover), eight are North American. However, the average size of the Swedish plants is approximately two to three times larger than those in Sweden's main market area in Western Europe

Since 1973 the number of *sawmills* in Sweden has been reduced by more than 1000 units, and in 1980 there were about 2600 producing sawmills in the country. Approximately 700 of the mills that closed down had an annual capacity of less than 1000 m^3 per year, i.e., the reductions hit the smallest plants. Production in Sweden increasingly is dominated by the large sawmills, and those with an annual production of 1000 m^3 or more accounted for 86% of output in 1979 compared with 81% in 1973 (current figures are not available). The small sawmills are evenly distributed throughout the country while the large ones are concentrated in the northern and central parts. In 1983 the sawmill industry received approximately 33 million Swedish crowns (SEK) in transport subsidies from the government.

From *Table 10.8* can be seen that labor's share of the sales value decreased from the middle of the 1970s as a result of the continual structural changes in the industry, i.e., the reduction in the number of small sawmills. This structural change implied an increasing capital intensity in the sector. The gross profit margin increased gradually due to increasing capital intensity but also fluctuated considerably over the business cycle. The high profit level of 1974 can be explained by intense economic activity combined with a restrictive wage agreement. The exceptionally low gross profit margin in 1976 was the effect of low-capacity utilization due to lost shares of the export market.

Table 10.8. Sales value and cost structure of the Swedish sawmill industry, 1970–1983 (Official Statistics of Sweden – *Manufacturing*, 1970–1983).

Year	Sales value (million SEK)	Costs as % of sales value			Gross profit as % of sales value
		Timber	Labor	Other	
1970	3274	55	23	4	18
1972	3755	56	25	4	15
1974	7773	51	16	3	30
1976	7144	63	22	4	10
1978	8066	63	16	5	16
1979	9393	59	14	5	22
1980	11249	56	12	5	27
1981	10576	59	14	6	21
1982	11285	60	13	6	21
1983	14035	58	11	6	24

From *Table 10.8* it can also be seen that timber costs have increased from the middle of the 1970s. Since then these costs have followed every upward price movement of sawn products in a much more significant way than before.

After the heavy fall in production in 1975, the output of the sawmill industry did not markedly increase up to 1979. During this period it had a considerable overcapacity, which depressed its profitability.

Table 10.9 shows that investment activity in the sawmill industry has been noticeably higher than in the Swedish manufacturing sector as a whole during the period 1978–1982.

Table 10.9. Investment of value added (%) in the Swedish manufacturing industry and in sawmills (Official Statistics of Sweden – *National Accounts*, 1978–1982).

Sector	1978	1979	1980	1981	1982
Manufacturing	11.7	11.1	13.4	12.9	10.8
Sawmills	14.7	14.0	17.8	18.5	12.8

Of the investment costs in the sawnwood industry, 2.7% were financed by government localization subsidies during the period 1978–1982. For the manufacturing industry as a whole, these subsidies accounted for 1% of investment costs for the same period.

The Swedish *wood pulp and paper industries* are mainly producing bulk products which – for Swedish industrial conditions – require large-scale production to achieve efficient and least-cost output. In this respect the Swedish forestry companies keep well up with their main competitors. This favorable competitive position is expected to last for the remainder of the decade. This, in turn, is especially important with regard to the significant increase in investment costs in the forestry industry that took place in the 1970s.

Table 10.10 shows investment activities in the pulp and paper industries as a percentage of value added during the period 1978–1982.

Table 10.10. Investment of value added (%) in the pulp and paper industries (source as in *Table 10.9*).

Industry	*1978*	*1979*	*1980*	*1981*	*1982*
Pulp	75.9	37.3	52.6	58.8	41.0
Paper and board	18.8	13.8	15.8	24.0	23.5

Comparing *Tables 10.9* and *10.10*, it can be seen that investment levels in both the pulp and the paper and board industries were higher than those in the manufacturing industry as a whole for the period 1978–1982. In general, industry's investment activities rise at the beginning of an economic recovery. The extremely high investment activity of the pulp industry is the result of the economic boom during the period and was achieved by a far-reaching structural change of the sector and modernization of production equipment. A similar investment process is actually taking place (as of 1985) in the paper and board industry.

The latest wood pulp factory in Sweden, which was built ten years ago, would require an investment amounting to more than $300 million if built today. Installation of a new paper-producing machine requires at present an investment of approximately $90 million. In countries such as France, West Germany, and Brazil increased investment costs have led to very high fixed costs, causing financial crises in companies. The immense investment costs are mainly sunk costs, and are consequently substantial entry barriers. These findings imply that expansion of the capacities of the wood pulp and paper industries has been retarded worldwide.

The competitive structure of the Swedish wood pulp and paper industries has been obtained at the cost of a very painful transformation. About 60 wood pulp factories have been closed since 1960, and *Table 10.11* illustrates this transformation process in its figures on average capacity per unit. One should be aware of the fact that this table does not show the number of closed or newly established units during the period but only the net changes.

Large factories producing sulfate paper, mechanical pulp, fine paper, and board were established during the 1970s. As can be seen from *Table 10.11*, capacity of the paper-producing machines has grown considerably. On average, the output of a new machine is six times greater than that of an old one. Larger machines are much more efficient and accelerate the integration of wood pulp and paper production. Depending on quality, the cost advantage of integrated production is 8–15%. Newsprint, kraft liner, semi-chemical fluting, and sack kraft paper are mostly produced in totally integrated processes. On the other hand, the production processes of tissue and special paper are normally not integrated. There is increasing integration in the production of writing and printing paper.

Table 10.11. Structural changes in the wood pulp and paper industries in Sweden (sources as in *Table 10.3*).

Industry/measure	*1970*	*1980*	*1982*
Wood pulp:			
Number of establishments:			
Sulfate	30	29	26
Sulfite	34	14	10
Mechanical pulp	25	22	21
Semi-mechanical pulp	9	7	2
Total	98	72	59
Total capacity (1000 tons)	8896	10540	9625
Average capacity per unit (1000 tons)	90	146	163
Share of pulp processed to paper (%) in Sweden	52	64	68
Paper and board:			
Number of establishments:			
Newsprint and magazine paper	6	8	8
Kraft paper and kraft liner	17	18	16
Fine paper	11	11	10
Other papers	17	12	10
Other board	17	13	13
Total	68	62	57
Total capacity (1000 tons)	5771	7210	6860
Average capacity per unit (1000 tons)	70	116	120

The degree of integration has increased during the 1970s; however, there are substantial differences in the rate of integration among countries and different paper qualities. *Table 10.12* shows the share of wood pulp and paper production taking place in integrated factories in some producing countries.

Even incomplete, *Table 10.12* nevertheless shows that the degree of integration is increasing. Moreover, in existing integrated plants there is a tendency for a smaller part of the pulp produced to be sent to the market.

Table 10.12. The share (%) of integrated production (*Pulp and Paper Techniques*, 1983).

		Pulp factories based on		*Paper and board factories based on*	
Country	*Year*	*Production*	*Units*	*Production*	*Units*
USA	1967			68	30
	1980	43	68	77	37
Sweden	1970	55	62	93	71
	1980	67	68	87	60
Finland	1970	66			
	1980	74		95	
Norway	1973		46		
	1980		56	78	

The degree of integration also differs considerably between countries that are net importers of wood pulp and paper and those that are net exporters. In the net-importing countries only 20–40% of paper production is integrated with wood pulp production; in net-exporting countries the figure is to 85–95%. As a large producer and exporter of wood pulp, Sweden has further possibilities of increasing the degree of integration.

New factories for wood pulp production are more efficient than older ones in their use of both energy and wood. Costs of chemicals and labor are also lower in new establishments. Swedish wood pulp and paper producers are very efficient in their use of energy; at full-capacity utilization, the costs of energy are minimized. However, at lower capacity utilization these costs increase exponentially. (In the North American forestry industries the use of energy is subsidized.) The far-reaching structural changes in the Swedish forestry industries during the last decade have provided possibilities of developing both the best techniques for conserving energy as well as improvements from an environmental point of view.

The structural changes in the pulp and paper industries during the last decades have also had implications for the regional distribution of the industries. From *Table 10.13* it can be seen that in the pulp industry there has been a considerable shift of production from the northern to the southern part of Sweden. On the other hand, the northern part of Sweden has increased its share of the paper and board production at the expense of the middle and southern parts of the country.

Table 10.13. Regional distribution (1000 tons; % in brackets) of Sweden's pulp and paper and board production in 1969 and 1981 (*Statistical Yearbook of Forestry*, 1970, 1984).

Industry	*North*	*Middle*	*South*	*Total*
Pulp				
1969	4 017 (53)	2 072 (27)	1 475 (20)	7 564 (100)
1981	4 075 (47)	2 315 (26)	2 357 (27)	8 847 (100)
Paper and board				
1969	1 221 (30)	1 460 (35)	1 436 (35)	4 117 (100)
1981	2 338 (38)	1 854 (30)	1 990 (32)	6 182 (100)

10.6. Cooperation

In Sweden the prices of timber are determined by negotiations between cartelized buyers and sellers. In these negotiations the country is divided into five different price regions. The prices established are normative for most of the transactions of timber during the following felling season. On the other hand, the prices of standing forest timber for sale are set on a free and competitive market.

In principle, Swedish exports of sawnwood take place on a competitive market, i.e., there are no binding agreements between the sellers. For many years Nordic wood pulp producers have cooperated by exchanging statistics and market information in order to have a better basis for market forecasting. Exchanges of statistics with the North American producers and with some European countries have also been carried out for a considerable period of time.

Within the so-called "Scan" organizations, paper and board industries in Sweden, Finland, and Norway have developed a method of cooperation whose aim is mainly to protect the interests of the Nordic paper mills on export markets. There are different "Scan" organizations for different paper products, such as Scanfin, Scankraft, Scannews, Scanpapp, Scan sulfit, and Nordprint. In the European Paper Institute (EPI) Sweden has actively contributed to facilitate cooperation and exchange of statistics between the European paper producers.

Coordinated action between firms on the Swedish market in terms of agreements have to be registered with the National Price and Cartel Office. In 1983 there were 21 registered cartel agreements in the Swedish wood pulp and paper market. Of these, 50% consisted of agreements concerning cooperation in purchasing wood and recycled paper. Furthermore, there were exclusivity agreements and cartels for sales cooperation in different paper products. To finance heavy investments, joint ventures have been created between the country's producers, as well as between Swedish producers and foreign buyers. This cooperation has covered not only production equipment but also marketing. Thus firms can undertake heavy investments with reduced risks. This type of cooperation is expected to be more frequent in the future.

10.7. Quantities and Prices

10.7.1 The sawmill industry

As mentioned in the previous section, prices of timber in Sweden are the result of negotiations between cartelized buyers and sellers.

Sawnwood is a bulk product for which there is an international price level. This varies with general economic activity and especially with developments in the building industry. Approximately 50% of Swedish exports goes to the building industry and 10–15% each to the packing and the joinery industries.

The five major importing countries – Britain, Denmark, the Netherlands, France, and West Germany – are, to a great extent, dependent on three exporting countries – Finland, the USSR, and Sweden – for their supplies of wood products. Theoretically, the latter three could undoubtedly have a considerable influence on the price levels of the imports of the five countries. However, in Sweden and Finland there are a large number of sellers who compete with one another and make their own sales decisions. Some sellers feel that the solution to marketing difficulties is individual price-setting, i.e.,

prices should be the result of negotiations between sellers and buyers. Because of the way in which the international wood product market functions, these individual decisions would have a strong influence on the whole market. Sweden and Finland are market leaders in softwood in Europe, and therefore the conduct of their exporters is of great importance for the markets.

Some countries such as Egypt, Libya, Syria, Iraq, and Iran start the buying process by an invitation for tenders. Imports are often handled by a state authority, which can invite tenders through different channels (for example, through journals and newspapers).

During the period 1970–1984 the export prices of sawnwood increased by 440%. This increase led to an almost corresponding increase in that of sawlogs (360%). During the last few years one can observe a closer fit between the two prices than before. *Figure 10.1* shows cyclical fluctuations of the delivery prices of sawlogs and of the export prices of sawnwood. In the figure the effects of the trend are disregarded.

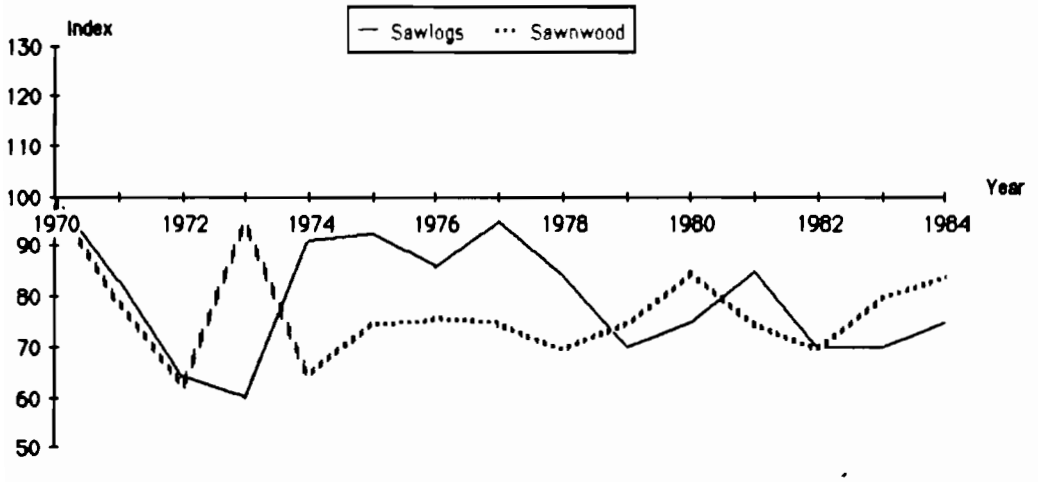

Figure 10.1. Cyclical fluctuations of delivery prices of sawlogs and export prices of sawnwood, 1970–1984 (Official Statistics of Sweden – *Statistical Reports: Price Indices*, 1970–1984).

From the figure it can be seen that the price of sawlogs follows that of sawnwood with a lag of about one year. Cyclical fluctuations in sawnwood prices have the following economic background.

In 1972 there was an economic boom in most OECD countries, and the inflation rate increased rapidly within the region. Economic activity fell off in late 1973, and due to the negative effect of increased petroleum prices on the balance of trade, several countries tightened their economic policies. The recession deepened, unemployment increased, and imports decreased. The recession continued into 1974, and 1975 saw the deepest international recession since World War II.

However, economic activity increased in 1976 in the major OECD countries, and during the following two years economic policies became more expansive. The growth rate of internal demand increased mainly in 1978, leading to a considerable increase in demand for imported goods. In late 1979 there was a new recession in the OECD countries, mainly due to increased petroleum prices. The recession grew worse in 1980, first in the USA, but later in the major European countries.

During 1982 economic activity in the industrial countries was weakened. Their aggregated GNP fell, and unemployment continued to rise. A recovery of the economic activity in the industrial countries started in 1983 and continued during 1984.

The Swedish sawmill industry reduced its production during 1971, mainly because of stagnating domestic demand. In spite of this reduction there was a heavy increase in stocks of sawnwoods. Production activity remained at its low level during 1972 and considerable stocks were decreased substantially.

At the beginning of 1973 the growth of export demand for Swedish wood products was extremely rapid as a result of extensive housing construction in Europe and elsewhere. The market was characterized by growing excess demand and rapidly rising prices.

Selling activities were intensive at the beginning of the year but were weakened during late 1973. During the first part of 1974 production in Swedish sawmills still was expanding but activity fell off during the last part of the year. Canadian exports of sawnwoods to Europe increased, and the Swedish market shares shrank. Building construction activity continued to weaken during the first part of 1975, and Swedish exports were heavily reduced. Demand for sawnwood in Western Europe grew strongly during 1976, and Swedish exports increased by 25% in real terms. Swedish sawmills reduced their stocks, and therefore the output of the industry increased by only 6.5%.

For Swedish sawmill exporters, 1977 was a year of disappointment. During several of the preceding years the Swedish share of the West European market had shrunk and it dropped drastically in 1977, showing the lowest figure since 1967. Canada registered heavy increases for both 1976 and 1977.

To some extent, decline in Swedish exports was due to reduced West European imports. The country's market losses together with other adverse factors – primarily Sweden's record high costs of raw material and labor – made it impossible for the country to maintain its competitive ability.

During 1978 West European sawnwood consumption on the whole remained at the same level as in 1977. The very high level of residential building in the USA stimulated sales of Canadian sawnwood to the US building industry, which dampened Canadian inroads into the European market.

During the first half of 1978, the European sawnwood market was characterized by importers' cautious purchasing policies; but during the second part of the year, the market improved, and the increase in the willingness to buy was accompanied by a rising price trend. Swedish exports increased by 11.5% in 1978.

In 1979 demand for sawnwood on the European market grew, but Swedish sawmills had problems in increasing their output due to a shortage of sawlogs. Therefore a considerable share of Sweden's market was lost in Western Europe. Overcapacity in the Swedish sawmill industry was 20%. Expanding demand within Western Europe in 1980 forced export prices of softwood upward and the volume of unfilled orders grew. The labor market conflict in May–June 1980 affected output as well as exports, and capacity utilization further decreased compared with 1979.

The demand for sawnwood decreased significantly during 1981, mainly due to decreased building construction activity and reduced stocking by continental importers and consumers. Prices of sawnwood fell considerably during the first six months also since domestic sales deteriorated. In mid-summer 1981 the Swedish sawmill industry was in a severe recession. During the last part of the year there was a recovery due to a devaluation of the Swedish currency, and the country could take its share of the market from Finland and Canada.

In 1982 conditions in the Swedish sawmill industry further improved, and exports increased by 25% in real terms. The improvement in Swedish exports of sawnwood continued during 1983, mainly due to a new devaluation of the currency in October 1982. Because growth in the total market of sawnwood was modest, Swedish exports were taking a share of the market from competing exporters. During 1984 Swedish exports of sawnwood stagnated.

10.7.2. The pulp and paper industries

The number of wood pulp producers in the world is much less than that of paper producers. This is partly owing to the increasing degree of integration and partly to differences in optimal plant size between wood pulp and paper mills. Whereas in Sweden wood pulp was, to a large extent, previously produced for the market, it is now being gradually integrated with paper and board production. One third of the wood pulp produced in Sweden is still intended for the market. However, since only about 15% of the world wood pulp production is market pulp, it has become more or less a "surplus" product.

The market for pulp is characterized by a considerable number of individual sellers. It is evident that uniform prices within the main regions of the world market are established for a bulk product such as wood pulp. The greater exchange of information between different parties, from trade associations and other sources, also contributes to uniform prices. Due to the increasing degree of integration and growing cooperation between pulp and paper producers (for instance, in joint ventures), the proportion of world production of wood pulp that is marketed has gradually shrunk. The price of wood pulp is therefore greatly affected by demand fluctuations. This influence is strengthened by the fact that the average cost per ton produced increases

significantly at a lower-capacity utilization. Producers of wood pulp plan their prices on the basis of market conditions, their capacity utilization, and production costs. In order to maintain full-capacity utilization, wood pulp producers are inclined to reduce the price of their output. The major producers therefore exert a strong influence on the pricing process. In these circumstances there must be very good arguments for a small producer to maintain a price policy that diverges from that of the price leader.

Sales efforts of the wood pulp producers are primarily concentrated on the large, established markets, where they try to sell as much as possible. When demand is faltering, they increase their export promotions in other markets. Swedish wood pulp producers have worked up new markets in the Far East and elsewhere, e.g., Japan and North America. These are important complements to the traditional markets, since they allow producers to maintain a high degree of capacity utilization in cases of demand fluctuations and capacity expansions. However, so far only a minor share of the Swedish wood pulp export goes to "nontraditional" regions, and the ambition of the Swedish wood pulp industry is to build up permanent and stable markets.

Since 1970 the trend of the Swedish wood pulp export has been downward and that of the production of paper and board upward. In *Figure 10.2* we disregard these trends and concentrate on cyclical fluctuations.

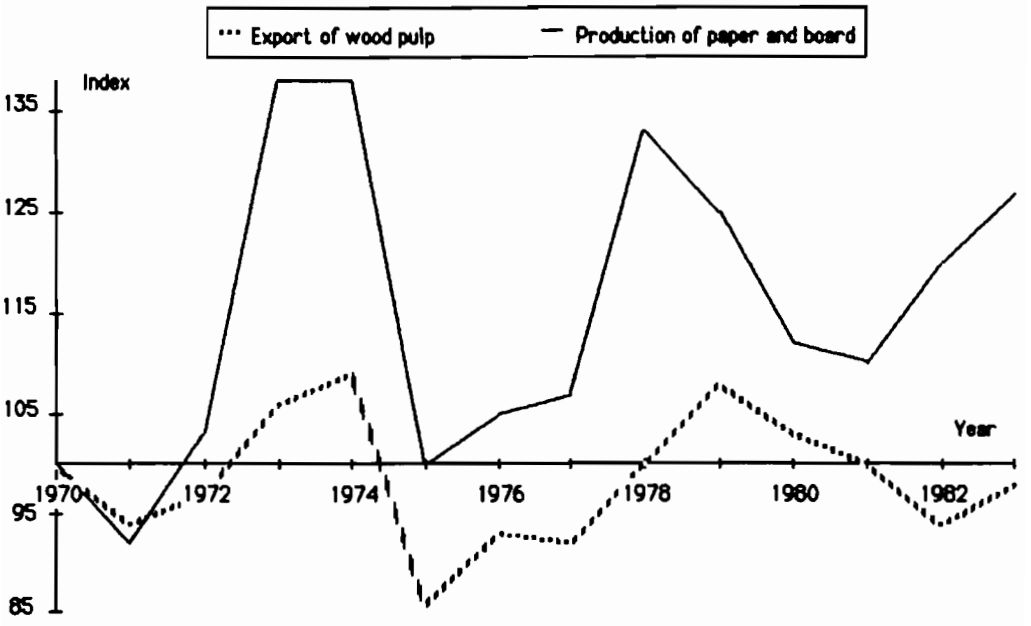

Figure 10.2. Cyclical fluctuations of Swedish exports of wood pulp and production of paper and board, 1970–1983 (Official Statistics of Sweden – *Manufacturing*, 1970–1983; *Foreign Trade*, 1970–1983).

From the figure can be seen that both paper and board production and pulp export follow the general level of economic activity, even if pulp exports fluctuate more violently than paper and board output. *Figure 10.2* confirms that the market for wood pulp fluctuates substantially over time.

Figure 10.3 shows the cyclical fluctuations of producer prices of wood pulp and paper and board for the period 1970–1984. From this figure it can be seen that wood pulp prices fluctuate more than those of paper and board. A comparison of *Figures 10.2* and *10.3* confirms the proposition stated above that wood pulp demand fluctuations affect the price of wood pulp considerably.

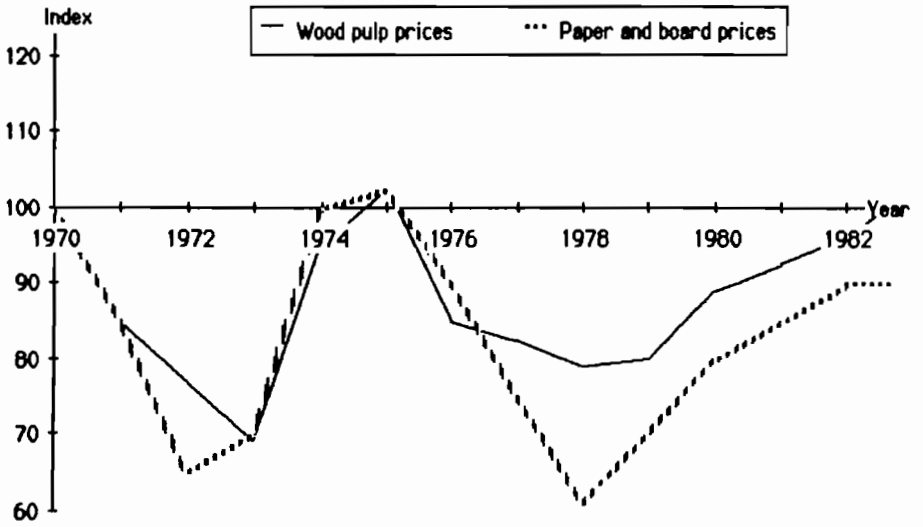

Figure 10.3. Cyclical fluctuations of Swedish producer prices of wood pulp and of paper and board, 1970–1984 (sources as for *Figure 10.1*).

The cyclical fluctuations of production, deliveries and prices shown in *Figures 10.2* and *10.3* have the following background. The international recession that was obvious in 1974 had serious effects on the Swedish wood pulp and paper and board industries from the beginning of 1975. Negative effects of falling sales on production could be partly reduced by increasing stocks, mainly of wood pulp. In spite of unfavorable sales, prices remained fairly stable for most of wood pulp and paper and board markets products. The reduced level of capacity utilization raised production costs, which, together with increasing inventory costs, significantly reduced the forestry industries' profitability. Increased paper and board production in Western Europe in 1976 was not accompanied by a corresponding growth in the demand for wood pulp. This fact was explained by an increased use of recycled paper and reduced inventories of wood pulp at the paper producers. At the same time, competition increased in the wood pulp market. Canada increased its supply in the Western European market because American paper and board industries

met their raw material needs mainly from their domestic wood pulp industries. In addition, supply from other exporting countries such as Portugal and Spain was substantial. As a result of the prices charged by the Swedish pulp producers, the competitive situation rapidly deteriorated, and toward the end of 1976 Swedish wood pulp prices started to fall.

Competition became more difficult in the wood pulp market in 1977, and Swedish exporters lost market shares. However, this negative tendency was arrested toward the end of the year. Buyers also became willing to abandon quarterly and semi-annual agreements and accept contracts for shorter time periods. The large inventories of wood pulp became a financial burden. By cutbacks in production and by increasing exports to markets mainly outside Europe, it was possible for Swedish pulp producers to halve their excess pulp inventories. Trends in prices were most unsatisfactory, mainly for chemical pulp. Depreciation of the Swedish currency and price reduction of wood gave Swedish industries some protection on the export markets. However, the value of these positive factors was limited by the weakening of North American currencies and rapid domestic inflation.

In 1978 the most important markets in Western Europe for Swedish pulp and paper enjoyed a reasonable economic growth. At the same time the inflation rate slowed down. The increased output rate of the paper and board industries raised international pulp sales. The improved demand situation made it possible to reduce the producers' inventories substantially during the first six months of the year. At the end of 1978 the output capacity of market pulp was well utilized. In spite of a more favorable demand situation and some moderation in the increase in costs, the profitability of the Swedish pulp and paper and board industries was very unsatisfactory in 1978.

In 1979 the international economic development became strongly influenced by rapidly rising petroleum prices and increasing political unrest. The lengthy economic boom in the USA was broken. However, this decline in the US economy did not result in a corresponding reduction in the demand for pulp and paper. The pulp and paper industries in North America had a very high degree of capacity utilization for the entire year. Their exports were stimulated by the continuing depreciation of the dollar. On the other hand, production costs, especially for labor, increased rapidly in the American and Canadian pulp and paper companies. Because of high activity within the paper and board industries, the demand for market pulp became very strong, and it could not be satisfied by current production even at full-capacity utilization. At the end of 1979 the international wood pulp market was very stable.

In 1980 the world's economic growth rate decreased, but the international wood pulp and paper industries as a whole enjoyed a reasonable demand, which allowed a high degree of capacity utilization. However, at the end of the year the recession deepened, and the demand for wood pulp and paper decreased.

Due to conflicts in the labor market and a shortage of pulpwood, Sweden could not maintain its market share in Western Europe, and Swedish sales were replaced by American ones. However, oil prices in the USA rose considerably, and the rapid increase in costs in American pulp and paper industries held

back price reductions. Sales of American marginal production to Western Europe at very reduced prices have otherwise been a frequent phenomenon of economic decline, which has seriously disturbed the markets.

During the first half of 1981 the international market for wood pulp was good; demand was high as was the utilization of capacity. Sweden maintained its market share in Western Europe, but sales to the non-European markets decreased. However, during the latter part of the year economic activity slowed down. The expected international economic recovery did not take place during 1982 and weak economic growth continued. For Swedish wood pulp and paper industries, 1982 was a year of disappointments, and the exports of wood pulp were reduced by 12%. The greater part of this loss came from markets outside Western Europe while exports to the EEC were better maintained.

After several years of low international economic growth and a stagnating production and consumption of wood pulp, paper, and board, there was a change during 1983. Economic conditions were improving in the USA as well as in Japan, its greatest trading partner. In Europe the economic activity was still slow. However, the former downward trend in the production of wood pulp and paper changed upward. In 1983 the international sales of chemical wood pulp increased by approximately 8%. The producers raised their capacity utilization from 83% to more than 90%. During the year the producer inventories were, on the average, at a normal level.

In 1983 the Swedish wood pulp industry made good use of the improved international market conditions, maintaining its market shares in Western Europe and capturing new market shares, especially in Southeast Asia. During the last six months of the year producers were using their production capacity fully. As the dollar rose against the Swedish crown, the revenues of Swedish mills increased. The structural reorganization of the Swedish wood pulp industry, which involved *inter alia* a reduction of the production capacity, has meant a further strengthening of the Swedish ability to compete.

10.8. Product Differentiation

The sale of sawnwood is mainly based on personal contacts between sellers and buyers. The price is an important competitive device, and good credit conditions are important on certain regional markets such as Iran, Iraq, and Libya. Swedish sawmills enjoy a competitive advantage on the West European market by their proximity. Swedish sawmills are capable of delivering small parcels of sawnwood to this market and consequently serve as "stockist" for the buyer. Well-adapted packaging and fast deliveries are also important. In recent times, in order to be able to reduce the dimension of the products and thereby save sawnwoods, the sawmills have started to test the solidity of the products by "testgrading".

Although wood pulp is a bulk commodity, there are, nevertheless, differences in quality. A paper producer uses a special quality mix of wood pulp, depending upon technical conditions and market requirements. However, for

greater flexibility, buyers of wood pulp are also interested in standardization of this basic material. Bleached sulfate pulp, which is Sweden's main export product, is thus an almost entirely standardized product from an international point of view. Södra Skogsägarna, the largest producer of wood pulp for sale in Sweden, delivers a similar quality of wood pulp from its three mills. The firm is of the opinion that this strategy is the best one, and it does not try to adapt itself to the buyers. This is necessary in order to obtain as large a potential market as possible. The buyers of wood pulp are nevertheless characterized by a considerable "supplier loyalty". Changing suppliers means increasing costs, for technical and other reasons. Furthermore, a change of supplier might involve the risk of losing the service to which the buyer is accustomed. Another reason for supplier loyalty is that some suppliers are considered as safe. The labor conflicts that have sometimes occurred in Canada have caused interruptions of deliveries, to which buyers have responded by replacing Canadian with Swedish wood pulp. This has, of course, improved Swedish market conditions. However, there are now tendencies indicating that supplier loyalty is weakening.

Wood pulp producers have also discussed means of increasing the loyalty of buyers and reducing the price sensitivity of demand by adapting the wood pulp to prescribed end uses. This specialization implies, in all probability, a reduction of the market, which, however, can be compensated for by increasing prices and thereby increasing total revenues. Technical experts maintain that the potential of wood pulp has not been developed as far as possible; further research might provide additional end uses.

Traditionally, paper production has been aimed at satisfying the desired market requirements, with paper mills delivering small quantities to different buyers. However, during the last few years products have been standardized to a very large extent. This has more or less been forced upon the buyers, and the reason is the utilization of large papermaking machines with fixed patterns of production. Standardization has been accompanied by more rational means of distribution and sale, which have enabled producers to realize economies of scale and reduce costs. This has been possible because of the increased concentration in the printing industry and the integration among paper mills, paper wholesale dealers, and printing firms. A reduction in the assortment of papers has also brought about more rational procedures in the wholesale trade. Because of their commitments in the distribution of paper, Swedish paper producers now maintain close contacts with buyers, with excellent possibilities of controlling the assortment.

Standardized paper products have also facilitated a further processing by the buyers according to local needs. Close contacts between paper producers and buyers have also improved service, a very important competitive device.

During the last few decades increasing concentration in the wood pulp and paper industries in Sweden has considerably changed the sales and distribution organizations for these products. Companies are now working with large shipments to a small number of markets. They have their own systems of

shipping, and use their own or long-term charter ships. Producers have sales organizations in strategical locations within the most important markets, from which the development of the market takes place. In the remaining markets where the producers have no sales offices, trading houses attend to exports. However, many sales formerly handled by these trading houses are now being made by the producers themselves. However, in the future trading houses can still be expected to be important for some exports. They have the comparative advantage of being able to handle small deliveries, and have a good knowledge of market conditions and of how to reduce financial risks.

10.9. Summary and Conclusions

Sweden is one of the world's large producers of forest products. In 1983 the country was second after Canada among exporting countries of sawn softwood. During the period 1975–1983 the Swedish forest industries suffered an acute shortage of timber – despite increasing importation – which negatively affected their industries' capacity utilization. The insufficient fellings in the Swedish forests were due to several factor, *inter alia*, the tax system and uncertain expectations concerning future timber prices.

The major export product from the sawmill industry is sawnwood, with 85% of sales, and the most important buyers are the building and wood-processing industries. The major part of the Swedish exports goes to Western Europe, but the importance of non-European markets – Egypt and Saudi Arabia – is gradually increasing. Tariff barriers are almost unimportant for the Swedish exports of sawnwood products.

Since 1973 the number of sawmills has been greatly reduced and production is increasingly dominated by the large sawmills. As a result of this structural change, capital intensity in the sector has increased and labor's share of the sales value has decreased. The gross profit margin has gradually increased over time owing to increasing capital intensity, but it has fluctuated considerably.

Timber prices in Sweden are determined by negotiations between cartelized buyers and sellers, and these are normative for the following felling season. The prices of standing forest timber for sale, on the other hand, are set on competitive markets. Also the export of sawnwood goes to markets characterized by competition, and the prices of sawnwood products are determined on an international level. Prices are results of individual negotiations between sellers and buyers. In Europe, Sweden and Finland are market leaders in softwood. Some countries in the Middle East begin the buying process by an invitation for tenders.

During the last few years we have observed a closer fit between the export prices of sawnwood and those of sawlogs. The latter follow the former with a lag of one year. Sellers compete with the prices and also with credit conditions. By their proximity to Western Europe, Swedish sawmills have competitive advantages in these markets.

During the last decade the world's market for wood pulp has decreased. There are several reasons for this, notably the increase in the degree of integration between pulp and paper production. In existing plants a smaller part of the pulp production goes to the market than previously, and in modern plants the degree of integration is higher than in the older ones. Furthermore, joint ventures between pulp producers and paper producers have been established.

The basis for integration of production, which is most common in pulp-producing countries, is cost advantage. As a large wood pulp producer, Sweden has further possibilities of increasing this integration. During the 1970s the degree of integration increased in Sweden as a result of the structural changes accelerated by technical developments and a considerable decline in economic activity.

Investment costs have also increased very rapidly, and high capital costs have restricted the expansion of the world's capacity for wood pulp. Because of cost structure, high-capacity utilization is most important in new factories. At full-capacity utilization, for instance, energy costs are minimized.

Wood pulp is a bulk product for which uniform prices are to be found in different regions of the world. Even if the number of wood pulp sellers is high, price-setting is dominated by the large companies – they are price leaders.

Demand for wood pulp and paper fluctuates with the business cycle. In order to maintain high-capacity utilization the pulp producers try to expand their sales into new markets and, furthermore, are willing to reduce prices in their traditional ones. Because of the limited supply of wood pulp and a fluctuating demand for it, the market for wood pulp has become unstable, resulting in substantial price variations.

Swedish producers follow two different sales strategies. One is to produce a homogeneous wood pulp for the purpose of maximizing the potential market. The other strategy is to adapt the quality of the wood pulp according to the special needs of the individual buyer. The latter method allows the producer to continue with an independent pricing policy. Product differentiation reduces the price elasticity of the product and allows a higher price.

Guaranteed deliveries and service commitments are important competitive devices in the markets for pulp and paper. Thus, experience of the last decade shows that labor conflicts lead to permanent losses of market share.

During the last few years paper products have been standardized to a large extent. The reason for this development is the installation of large paper-making machines with fixed patterns of production. Standardization has made it possible to benefit from economies of scale in the distribution of paper and board and has facilitated further processing by the buyers according to local needs.

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CHAPTER 11

USA: Trade Channels for Its Forest Products

Donald F. Flora

11.1. Historical Background

Every American schoolchild is taught that European settlement in the United States began at Plymouth, Massachusetts, in 1620. Actually, permanent settlements started in the state of Maine in 1607. Whichever date one accepts, it is clear that, with remarkable speed, the many sophisticated crafts involved in wooden shipbuilding were assembled, organized, financed, and supplied with raw materials. By 1630 ships were being built in the northeastern states for coastal and overseas trade, and wood products were on the move. By the 1660s there were a hundred sawmills in the northeast. Most of the initial settlements along the east coast of the United States were the product of European mercantile policies intended to exploit the "free" resources across the Atlantic. In many cases these efforts were unsuccessful on purely economic grounds – other sources for wood products proved cheaper. So, except for specialty items such as knees and masts for shipbuilding, the considerable wood exports from America moved to the Azores, Madeira, the Canary Islands, and the Mediterranean (Davies, 1983).

In the 1830s entrepreneurs began bringing ships from the east coast to the west coast of the United States for use in exporting timber products as well as in an active coastal trade. Chile, Peru, Mexico, and Hawaii were the major customers. In the 1850s timber cargos were sent to Australia and China. These ventures involved problems with communication. An order would take 30 days in transit from Australia, followed by sawing and loading, and another month for the return voyage. Meanwhile, markets changed frequently and drastically, and the absence of currency or other means of payment required bartering. Neither banking facilities nor insurance were available. With the average life of ships being less than ten years, trade was a risky business indeed. With risk, of course, came profit (Cox, 1974).

By 1860, a late date in the development of many nations but early in American economic history, the United States was actively involved in overseas trade in forest products.

11.2. Market Structure

11.2.1. Lumber and plywood

Lumber and plywood, together, represent one of the largest US industries, with over 350000 people employed in their production. Plants in the USA are large compared with those in other parts of the world, trucks frequently carry roundwood for 150 km, and hauling by rail involves even longer distances.

Lumber and plywood exports are equivalent to about 5% and 2% of American consumption, respectively. Lumber imports correspond to about 25% of domestic consumption. Because of a tariff, very little softwood plywood enters the USA; however, hardwood plywood imports amount to about 60% of that used domestically (Darr, 1980).

A single parent company frequently owns several mills. Many firms are integrated vertically into distributing and wholesaling, and also control a significant fraction of their raw-material needs. Few companies, however, rely solely on their own timber, and assurance of a complete wood supply is generally not a corporate objective. Ellefson and Stone (1984) report that in 1977, the latest year for which data were available, 11% of the value of shipments by the sawmill–planing mill industry was accounted for by four firms; the fifty largest firms shared 49% of the business.

In dealing with domestic markets mill managers have employed every marketing mechanism known, including transfer to the firm's own distributors, wholesalers, or retailers; sale to external distributors or beyond; and sale through brokers. A growing outlet is direct sale to building contractors. This development has been encouraged by the large scale of US commercial and residential building.

Domestic marketing frequently embraces more than dispassionate, arm's-length transactions. Most buyers and sellers perceive an advantage in maintaining the goodwill of their trading partners and attend to this in many nonprice ways. Buyers may offer short-term credit and long-term financing to sellers; sellers may offer such accommodations to buyers. Special attention to timeliness in deliveries, continuity of flow, and quality maintenance are examples of nonprice benefits that vendors may offer.

The size of the market and the large number of lumber and plywood producers in large marketing zones induce a high degree of competition. One product of this competition is a desire to differentiate products, e.g., advertising, end coating, packaging, and even artificially coloring wood products.

The scale of the domestic market and the diverse opportunities available there have influenced US producers' views of markets elsewhere. There is a significant reluctance to adapt to metric sizing and foreign building modules in

the USA. Those who have dealt in international trade, however – about 4% of American lumber and plywood production goes abroad – have looked for and found the marketing amenities to which they are accustomed. Three thousand years of commerce, throughout most of the world, have created a full range of institutions to support trade, including communication, local and interregional transportation, credit, insurance, currency exchange, banking, agents, bilingual facilitators, warehousing, security for goods and traders, transport and housing for merchants, and exchanges or marketplaces where buyers and sellers can meet.

American lumber and plywood marketers, relative latecomers in most areas of trade, have taken advantage of existing offshore trading centers. With trade lines established and with developing confidence between buyers and sellers over product quality, payment, etc., a number of participants have recently bypassed intermediaries to deal directly with their ultimate trading partners. These relationships tend to be quite stable over time, remarkably so in the face of fluctuations in the amounts of goods traded, exchange rates, and prices. No matter how long-standing the trading relationships, however, price negotiations are conducted with full knowledge on both sides about prevailing rates. In addition, in this highly competitive field traders are ever watchful for new opportunities, economic trends, or political events that might foreclose old avenues.

The general picture, then, is one of conventional supply and demand schedules on the US side. Because economies of scale are especially significant in international marketing, there are instances in which a locality or specialized product is dominated by a single buyer or seller, but this is not seen as representative of the industry.

Scale economies in shipping have dictated ever-larger ships, limited only by channel depths and the size of turning basins. In this environment, a ship may require several stops to make up a load, and a single ship can absorb a large proportion of a mill's output. Competition in the maritime field and a world surplus of tonnage appear to have precluded dominance of sellers and purchasers in secondary locations.

Both vertical and horizontal integration have occurred among US lumber and plywood firms engaged in international timber trade. US milling companies have invested in land and processing facilities in Southeast Asia, the Philippines, and South America. US firms have also invested heavily in processing plants, timberlands, and cutting rights in Canada. A few US lumber and plywood firms have interests in drying, finishing, and remanufacturing plants in Europe in addition to distribution there. Joint ventures with foreign companies are very common and may comprise the majority of business arrangements. A few US companies have engaged in joint ventures with foreign firms on US soil (Atkins, 1983).

Investment in foreign activity represents the largest scale of trade involvement and is principally the domain of major, integrated firms or multinational enterprises. The visibility of these operations obscures the activities of hundreds of US entrepreneurs who engage in timber ventures abroad and thereby participate in wood products trade.

11.2.2. Logs and chips

About 12 million m^3 of softwood logs are exported annually from the USA, virtually all from the west coast. An additional 1 million m^3 of hardwood logs, mainly from the east and Gulf coasts, go overseas each year. US exports of pulpwood chips are close to 4.5 million short tons per year, mostly from the Pacific coast. The principal destination for logs and chips is Japan, which is the principal market also for cants and sawnwood pieces. Cants, included in the lumber statistics, are produced in areas where export of logs is prohibited, notably the federal lands of the Western USA (Sedjo and Radcliffe, 1980; Ulrich, 1983).

Log and chip exports have declined by about 35% during the recent recession formally assigned to 1980–1982 (the economic slump), which has affected wood products from 1979 through 1983 (Ruderman, 1983; Ulrich, 1983).

Relative to lumber and plywood export, the number of log and chip vendors selling overseas is small. In Washington State, which ships about 70% of all exported softwood logs, there are 130 firms selling into export (*Random Lengths*, 1982). Fewer than a dozen firms export chips. This apparent concentration obscures the fact that virtually every sawmill produces chips for sale to either exporters or pulp mills. Export firms compete actively for both logs and chips and have consistently paid premium prices for these products. For logs, the differential is at least 50% (see *Figure 11.1*), a fact that is puzzling to those outside the trade but which partly reflects special sorting for high-quality, relatively expensive storage facilities near embarkation sites and seller-borne costs of operating a trading apparatus. Log dealers take title to truckload lots brought to the yards by loggers, and sort, grade, tag, and trim the logs as necessary for assembly of shipload lots. A similar approach exists for chips, with an emphasis on securing better-quality (uniform, bark-free) material.

Partly because of domestic competition for these forest products, exporters have sometimes achieved long distances for both logs and chips. Movements from the Rocky Mountain region to the Pacific coast, a distance of several hundred kilometers, became common as the export trade expanded.

Exporting firms (brokers, dealers, and agents) are, in some instances, entrepreneurial ventures started by individual Americans and in others are foreign-owned, particularly by Japanese trading companies. A number of them derive from timber companies expanding into foreign business to broaden the volume and range of log acquisitions. A significant fraction of the trade in these products is carried out by major forest products firms dealing directly with overseas trading companies.

Although trade promotion occurs in the context of scouting new markets, the well-developed American institution of advertising is not used for these products. Product differentiation is not used either except for attention to grades and quality control. Competition appears to depend primarily on price and reliability.

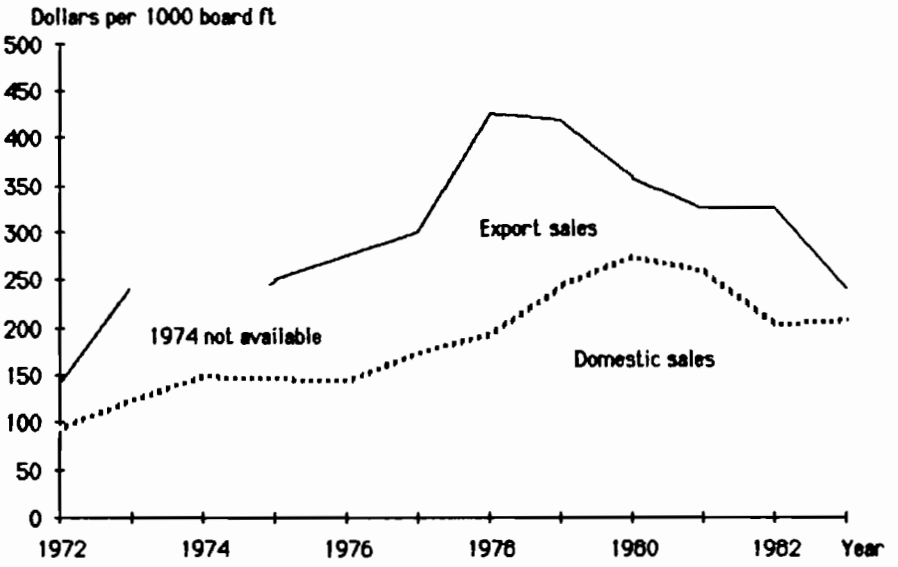

Figure 11.1. Log prices, Hemlock grade No. 2, western Washington and northwestern Oregon (Ruderman, 1983).

11.2.3. Pulp and paper

About 7 million metric tons of pulp, paper, and paperboard are being exported from the USA each year. About half goes to Western Europe, the rest to all other parts of the world. About 11 million tons, mostly newsprint and pulp, are imported, primarily from Canada. Pulp imports and exports are equivalent to 4% and 2.5% of US consumption, respectively. For paper and board the corresponding figures are 11% and 5%. The scale of the activity is suggested by the 282 pulp, paper, and board mills in the USA, not all of which are involved in foreign trade, of course. They employ over 160000 people (Darr, 1980; FAO, 1983; USDA, 1982).

Many US firms involved in pulp and paper are highly integrated – horizontally into lumber and plywood, and vertically into raw materials. A smaller proportion, particularly in the eastern states, limit themselves to buying pulp and producing specialty papers.

Ellefson and Stone (1984) describe the pulp–paper group of industries as "moderately concentrated". Among pulp mills, four companies generated 48% of shipments in 1977; the largest firms accounted for 99% of shipments from paper mills, 23% was attributable to the four largest firms, while the largest companies developed 70% and the largest shipped 92%.

The large number of grades of newsprint, paperboard, and pulp, plus the vast array of paper items, make this portion of the forest products sector extremely complex. Most of the largest US companies have sales arms overseas and many have manufacturing plants abroad. These plants are usually

operated as joint ventures with firms in the host country, and in some cases have garnered significant market shares in the host country and in nearby markets. Americans who import from Canada also tend to operate subsidiaries or joint ventures in that country. Economies of scale lead to a relatively small number of large plants within a forest region, creating natural oligopsonies. Perhaps a quarter of the assets in the Canadian wood sector are controlled by US firms. Nonetheless, the scale of trade is so large that numerous buyers and sellers participate in the US pulp and paper trade (Truitt, 1983).

Partly because of heavy overseas investments, relations between the US pulp and paper industry and foreign buyers and sellers tend to be stable over time, but with well-defined marketing channels. This is not to say that prices and quantities do not fluctuate; an inspection of trade statistics quickly demonstrates otherwise.

11.3. Price Formation

It appears that classical supply and demand curves reasonably describe the market behavior of broad segments within the US forest products trade. Sellers and buyers respond to price signals, generally deal at arm's length, and, in the aggregate, interact with their foreign counterparts to establish market-clearing prices and quantities. There are certain products and locales within which buyers and sellers are conscious of their individual effects on the market; they then face sloping rather than flat supply or demand functions. It will be argued later in this chapter that buyers and sellers are remarkably knowledgeable and that inertias in the system, at least at the US end, are largely attributable to the time involved in transporting a bulky commodity across long distances. In some segments of the trade there are frictions and outright obstacles, also described later, but, except for softwood plywood, these do not appear to hinder the free-market nature of trade in the USA.

At an operational level marginal production costs appear to comprise the foundation for supply relationships, and demand derives from markets for end products. Although mention has been made of continuity in trade relationships, there is great willingness to adjust to changing market conditions. For example, the major US exporter of logs began, in 1983, to negotiate sales on an individual shipload lot basis; this because of uncertain markets.

The numerous profit centers that have been established within integrated corporations have some relevance to international trade. Internal prices established between operating divisions are influenced by many factors other than market forces. Yet such prices appear in certain trade statistics and have an effect on negotiation for purchases and sales by corporate units. How significant this is on prices and the directions in which it presses market equilibria are unknown. Similarly, allocation of costs and revenues to joint inputs and joint products occasionally creates confusion in marketing. It is not uncommon, for example, to hear that a sawmill is losing money on lumber and making a profit on chip sales. In such circumstances an interpretation of

short-run prices as an indicator for long-run market movements is certainly inappropriate.

Premium prices in foreign trade for logs and chips have existed since export sales for products began in the early 1960s. Although the premium is partly attributable to marketing costs, treating exported logs as different commodities from those sold domestically seems reasonable in economic analyses.

Price leadership has been widely surmised in basic grades of pulp and paper. Broad publicity is given to price-change announcements from individual companies that appear to precede general adoption by the industry. The process does not conform, however, to the usual portrayal of price leadership as a noncompetitive process: that a particular firm moves first, with the others following it. In North America, however, the identity of the "leading" firm is not consistent, and followers do not always follow. In many cases announced single-firm price adjustments have been withdrawn when the industry failed to embrace the change.

Monetary considerations have important effects on wood products trade in both the short and the long term. Concern about short-term currency fluctuations heavily influences point-of-sale decisions as well as sale prices. In general, American traders appear to avoid risks, preferring, for example, to have contracts denominated in dollars even in the face of, say, the 1973 Japanese upward revaluation. Longer-term monetary shifts especially concern firms involved in foreign manufacturing investments from which they cannot quickly withdraw. Hedging in foreign currency is a practice apparently limited to such companies and to the major US trading firms.

Uncertainties about price, currency, credit, and other factors discussed below have encouraged a robust network of factors and dealers. Brokerage and consignment sales are also common. Experienced larger firms have posted bilingual agents in major marketing centers to gain market intelligence, eliminate profits to the "middle man," and neutralize the mystique and leverage of foreign importers. Some firms have taken advantage of both marketing systems by continuing to deal through foreign trading companies while operating through agents as well. Joint ventures and independent foreign investments have been the province of a smaller but growing number of American companies.

Liquidity in foreign dealings seems to be afforded mostly by banker's acceptances, superseding letters of credit since active trading in the former, negotiable instruments, began in 1977. The sight draft, a form of payment imbedded in US history, seems to largely remain there. However, documentary collections, involving no credit instruments, are common. Credit, where it is used, is offered by international banks and foreign trading companies; the role of US trading companies is described below.

The spot market is operative in all areas of US forest products trade. Long-term, multiple-shipment agreements also prevail in many combinations of duration, risk-sharing, and provisions for price renegotiation.

11.4. Grading and Measurement

Standards, units of measure, and quality control have special significance in international trade (Ethington, 1983). The matter of standards is exemplified by the previously mentioned premium paid for export logs. US grades, few in number, fail to recognize the appearance standards important in Japanese structural applications. A more intricate system of value-related standards, only roughly corresponding to US log grades and inexplicable in the American context, is warranted by the wide range of end-use values for wood in Japan and the considerable height of the upper end of that range. Even for US applications, an integrated firm may recognize 20 or 30 categories among species, sizes, straightness, knot size, and so on.

The uniformity and clarity of international standards for pulp and paper products would surprise any American who has compared the texture of European with US toilet paper. Obviously, different product specifications are involved, but the standards applied to the raw material and the testing procedures for judging whether those standards are met are well understood by organizations involved in trade.

Quality control, especially important in international transactions because of the cost of correcting or indemnifying for bad commodity lots, is probably the major source of friction between trading partners. Inspection and third-party verification have always been an important part of US trade activity. Inspection, replacement, and rebates are among the hidden but pervasive costs of trade generally passed over in economic analyses on the assumption that they are reflected in pricing.

Americans remain unaccustomed to metric measure. This has apparently not much impeded imports of Japanese and European cars but has greatly affected lumber and plywood trade. Production in metric sizes, for structures built in metric modules, is increasing in the United States.

11.5. Incentives, Barriers, and Entry

Even when the value of the dollar was high, concern about the US trade deficit has induced a climate encouraging exports. The federal Departments of State, Commerce, and Agriculture have active programs of assistance to those interested in making contact with potential traders abroad. For some time smaller firms have sought to establish consortia of firms not strong enough economically to enter international trade alone. Such a mechanism is provided in the Export Trading Company Act of 1982. The Act protects combinations of exporting firms from antitrust action and offers US banks a comprehensive role in serving as intermediaries by allowing them to form their own trading companies. A few banks have formed such companies, as have other organizations, including foreign firms, but there has been little substantive trade activity related to these so far.

Outside the US federal government, there are other inducements to exporters. Lumber and plywood trade associations have had aggressive

promotion programs overseas. Port districts, which are state-chartered local government units with limited taxing powers, have been established to operate ports and other transportation facilities at cost. Competition among and within states for port activity is to the general benefit of imports as well as exports.

US firms considering exporting perceive a number of barriers. One of these is the need in some cases to shift to metric measure. Another is language. Despite a long history of trade, few Americans are comfortable in a different cultural environment and fewer still are bilingual. Also in the USA there is a limited understanding of the mechanics of trade and international finance. Hedging in currency futures markets, for example, is foreign to most US products firms.

There has been a tendency among US wood products exporters to enter world trade only during times of soft markets in the USA. From the American side the markets abroad have had a welcome stabilizing effect on production. The perception from abroad is of unreliability and exploitation.

Yet another view is that exports represent a continuing, and indeed rising, outlet for US production – a "grand design" that is partially interdicted by American consumers as they bid up wood prices during flurries of construction.

Foreigners contemplating sales to the USA typically are better prepared through education about trading partners' customs than are their American counterparts. However, they immediately confront strange measurement systems, from board feet to fractional pricing in the securities markets. There are also import tariffs on a few items, including unfinished hardwood plywood of certain species (8%), unfinished hardboard (3%), particleboard (4%), and a 20% tariff on softwood plywood that will drop to 8% when a plywood standard for North America is established (Radcliffe, 1980).

Protectionist sentiment is apparent in the US business press, and is attributed to weakness in other industries. A tariff barrier to wood products imports from Canada has been proposed but not adopted.

Foreign building codes are seen as significant barriers to imports from the USA. It would be reasonable to assume that US codes would be similarly difficult for exporters to the USA. The bulk of imported construction wood comes from Canada, however, whose domestic building practices are similar to those in the United States.

11.6. Inventory Policies and Market Risks

One might suppose that overseas trade, dependent as it is on ship-sized transport, requires substantially larger inventories than sales made in units of individual truck and railway carloads. It does. The advent of container shipping, however, permits truckload lots of forest products to be gathered, loaded, and shipped in a uniform, unitized manner. To accommodate containers as well as logs and chips, special ships are now available. One result is that smaller inventories can be held at mills and ports. This reduces the amount of capital

that is necessary and also means that producers and traders are less vulnerable to changing markets. Elapsed time from the manufacturer to an overseas purchaser's dock still can easily exceed a month – a period when buyer, seller, dealer, and factor carry a risk of changing markets. Assuming that the default and currency risks are otherwise covered, month-to-month price changes, a fair measure of market risk, occasionally exceed 20% (Evans, 1983).

11.7. Communication and Transportation

Virtually trouble-free, low-cost distance telephone service in the USA has permitted creation of complex communication networks for banking, currency trading, commodity exchanges, and business transactions in general. Mill and sales managers in tiny, seemingly remote communities can, and often do, make contact with home offices and brokers on an hourly basis. The advent of satellite communications and linked computers has made the process faster and cheaper. As a consequence, participants in US trade can be expected to be well-informed about their options and associated economies.

Significant changes in transportation costs followed the deregulation of inland transport in the USA in 1979. One effect has been to make rail transport costs more nearly proportional to distance. A long-standing rate structure that was especially favorable to the west coast has largely disappeared. The southern states have thereby become more important suppliers to domestic markets, thus raising the consciousness of west coast producers toward foreign markets.

The principal consideration here, though, is that even after deregulation, overland cost is a small proportion of the value of the lumber as delivered to a port – on the order of 10% within a region and not more than 20% even if hauled from the Rocky Mountains to a Pacific coast port. A considerable hinterland in the USA is therefore open to exporting at least during strong markets (*Random Lengths*, 1982). Port costs and ocean transport add only one fourth to one third to the cost of purchasing lumber for export from the US west coast. The conclusion is that the supply of wood products for export can be very large, and those exports can readily range the world. In the USA both the supply of and demand for exports have considerable depth (Doan, 1983).

11.8. Structural Changes

Two sets of evolutionary changes are under way that will influence the volume of market activity without affecting how market mechanisms operate. The first pertains to timber supplies from North America. After 20 years of preparatory research and pilot testing, waferboard, a variation on structural flakeboard, is available and being heavily promoted in the USA and Canada. The number of mills making this product exceeded 10 by 1985. The special

significance of this product lies in its substitution of hardwoods for softwoods in a structural panel product. If there is a coming wave of hardwood–softwood substitution one can foresee, for example, reduced dependence worldwide on softwood plywood accompanied by increased competition for hardwood chips. On balance, the important role of North America in providing softwood products to other nations may weaken slightly, including noticeable softening of prices and export volumes.

The other supply-related evolution is a trend toward uniformity in softwood–roundwood supplies. The Pacific coast of North America has long been renowned for its high-quality old-growth redwood, Douglas fir, and Sitka spruce. Informal analyses have projected that, depending on how one defines the old-growth resource, it could be largely gone in 10–15 years. The consequences will be a shift to smaller trees of species having quality characteristics similar to those seen elsewhere in the world and reduced opportunities to "sweeten the mix" for offshore customers.

The demand-related change reflects a recent softening of previous ever-upward trends in consumption of forest products. Partly, the plateau is an effect of the five-year economic recession. Analysts point, however, to growing self-sufficiency in Europe and Japan, lower real income per capita in North America, and smaller houses and greater use of substitute materials in many places as the major reasons. Certainly, relatively small structural changes of these kinds can have an important effect on the volume and composition of American timber trade and the economic welfare of trade participants.

11.9. Conclusion

Whatever the outlook for the volume of US trade in forest products, it appears that the American market structure can be viewed as conforming to the classical textbook model of competitive markets. Hundreds of thousands of transactions are executed annually among tens of thousands of participants. Market information is widely and quickly transmitted. Although instances of sheltered markets and specialized products can be found where a few buyers or sellers dominate trading, these instances are exceptional. Analysts concerned with aggregative studies across multiple products and world regions should find conventional competitive models appropriate to US forest sector markets.

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CHAPTER 12

USSR: Trends and Prospects in the Forest Products Trade

V.O. Volkov

12.1. Introduction

The USSR plays a major role as an exporter of forest products in the world market. Socialist countries are its major trade partners, and close economic ties between the socialist countries make it possible to meet the bulk of their demands. Being the principal supplier for the CMEA (Council of Mutual Economic Assistance) countries, the USSR covers more than 90% of their import demands in timber and about 50% in pulp and paper. The production of forest products in the USSR grows steadily, as does the trade, furthered by the abundance of this raw material in the USSR and its rather short supply in most CMEA countries.

Within the CMEA the trade in forest products, just as in other goods, is based on one-year, five-year, and long-term plans, which are duly agreed upon. The practice of mutual exchange is not restricted by the plans and is expanded through agreements on industrial cooperation and production specialization, as well as through compensation agreements.

The main principle that the USSR adheres to in its relations with the countries of different social systems has always been a policy of peaceful coexistence and international *détente*. For this reason the USSR maintains regular trade and economic ties with all countries that show concern for such mutually advantageous cooperation.

The USSR is equally willing to cooperate with both larger and smaller countries, making no discrimination between large, medium, or small companies, and thus promoting equality in international economic relations. As to our major trade partners in the West – West Germany, Finland, France, Italy, and Austria – relations with them rest upon long-term agreements.

The allocation of exports in the USSR takes into account its traditional relations with foreign partners based on existing intergovernmental and trade agreements on mutual deliveries, trade treaties, and long-term contracts. It is quite natural that the volume of exports depends upon both home requirements and the economic feasibility of exports, determined by the ratio between export earnings and the expenditure involved in manufacture of the products exported.

The planned approach to deciding on the volume and structure of exports provides for the most reliable and economically reasonable options. This approach also makes it possible to take full advantage of particular export branches. The Soviet forest sector, with its reliable raw-materials base and developed industrial base, is pledged to take an active part in the international division of labor.

The USSR is one of the world's richest in both forest area and growing stock. According to the latest (1983) inventory the forest area comprises 811 million ha, including 792 million ha of state forest. The forest area is growing, and since the 1961 inventory, it has increased by 73 million ha. Forest covers 35.6% of the land surface, and 73% of the forest area has coniferous species that yield valuable close-grained wood. The prevailing wood species in the USSR forests is larch, accounting for 38% of the total forest area. The figure for pine is 16%, for spruce 11%, and for cedar 5%. Soviet territory is covered extremely unevenly with forests. While the Asian part of the country contains 80% of the whole forest area, some other vast areas have no forests at all.

The country's total growing stock is estimated at 85900 million m^3. The stock of mature and overgrown timber makes up 54.4 million m^3, including 46300 million m^3 of coniferous wood. The national per capita figures are 2.7 ha for forest area and more than 300 m^3 for growing stock. When exploiting forests commercially due attention should be paid to other functions that the forests are able to perform. The forest, a major oxygen supplier, is an important factor of the biosphere; it is also a stabilizing one for landscapes, ecosystems, and climatic features. The recreational significance of the forest is also increasing.

Since the standing forest performs various ecological and social functions its use as a source of timber must be well balanced and in some cases restricted to a large extent. In the USSR a great part of the forest is completely excluded from routine commercial practice, logging work being either completely forbidden or strongly reduced. The protected forests possess 4000 million m^3 of exploitable wood, the figure increasing from year to year. The network of the country's reserves and national parks is becoming more extensive. In 1983 their number reached 154 and their area amounted to 14.3 million ha, compared with 8.9 million ha in 1976.

The allowed felling volume in the restricted forests is lower than that in commercial forests. This approach stems not only from the desire to keep the standing forests as they are but also from purely economic reasons. Logging practice in restricted forests is subject to rigorous forest-management demands and involves greater organizational efforts, which raises logging costs

by at least 20–30%. As a result, the mountain forests that cover one third of the forest area account for a mere 10% of the country's procured wood.

However, the total potential of timber supply from the USSR's forests is still very great. According to the 1973 estimates, a net annual increase of growing stock makes up 844 million m^3, including 577 million m^3 of coniferous wood. The allowable timber cut (permissible felling volume) in the national forests amounts to 640 million m^3.

In 1983 reforestation and afforestation were carried out over an area of 2.2 million ha, including the planting and seeding of forests over 1.0 ha, and assisting the natural regeneration over 1.2 ha. Though the 1970s and 1980s have not seen an extension of these efforts in terms of area, the quality and efficiency of this practice have been increasing and the results in productivity have improved.

In 1983 the USSR forestry industry employed 459000 people. In spite of the mechanization of forestry the number of employed has not decreased since many of the jobs are labor-consuming, especially tending the young stand. Note that the tasks faced are so complicated and vast in scope that even such a large number of forestry jobs proves inadequate and fails, in some instances, to prevent an undesirable change in species or to restore the cuttings.

12.2. The USSR Wood Industry

The vast forests of the USSR have provided a basis for the developed wood industry to yield considerable amounts of wood raw materials and to use these to the best advantage. The wood industry still holds an important place in the country's economy, despite the priority growth of such "new" branches as electronics, chemistry, and engineering, and its share in total industrial output is 4.5%. According to the 1975 data (more recent data are not available), the timber, pulp, and paper industry employed 8.2% of total industrial and production workers (i.e., 2.8 million), and those of furniture making, chemistry and other production activities 11% and 4%.

Within the wood industry, woodworking has developed more rapidly while wood logging has kept stable or even somewhat decreased in volume. This has involved a transition to an intensive stage using a new technological base, which is shown by the data on the growth rate of the total output, given in *Table 12.1*. Changes in wood removals in the USSR are shown in *Table 12.2*.

The volume of removals has been stabilized because logging in new, undeveloped, and remote areas is rather expensive; hence the need for more economically efficient methods of utilization and processing of raw materials rather than for increased harvesting output. The actual volume of logging is still much lower than available in the felling area, but the scale of logging remains significant, the area of annual felling exceeding 3 million ha, the area being equivalent to the territory of a country such as Belgium.

New resources of raw wood material are usually drawn from the regions where new tracks or railways are laid. For example, the Baikal–Amur railway

Table 12.1. Growth rate of total output (1940 = 1).

	1940	*1965*	*1970*	*1975*	*1980*	*1981*	*1982*	*1983*
Industry, total	1	7.9	12.0	17.0	21.0	22.0	22.0	23.0
Wood industry	1	3.7	4.8	6.2	6.7	6.9	7.2	7.4
Wood logging	1	2.3	2.6	3.1	3.0	3.0	3.1	3.1
Woodworking	1	4.5	6.2	8.1	9.2	9.6	10.0	10.0
Pulp and paper	1	6.8	10.0	14.0	16.0	17.0	17.0	18.0

Table 12.2. Changes in wood removals (million m^3).

	1940	*1955*	*1965*	*1970*	*1975*	*1980*	*1981*	*1982*	*1983*
Total wood	247	334	379	385	395	357	358	356	356
Industrial wood	118	212	274	299	313	278	277	273	275

made it possible to begin the exploitation of forest lands that spread over 100–200 km to the north and south of the railway, to cover a total area of 54 million ha with a tradable stock of wood of about 2000 million m^3.

However, there is a considerable potential for increasing wood-harvesting procurement in the developed, traditional forestry regions through silvicultural felling and more efficient use of broadleaf trees. In the European part of the USSR alone, one can obtain another 40–60 million m^3 or more through intermediate felling. No doubt the cleaning and sanitation cutting practice is much more labor-consuming and two to three times more expensive than clear cutting. However, as with the "sparing" kinds of clear felling, clear felling with narrow lanes and intermediate felling do not cause any grave ecological damage to the forest communities but contribute to natural reforestation and to a sharp increase in productivity. Thus expenditures on extra manpower and wood-cutting jobs are fully recovered, counterbalanced with economic gains due to improved raw material resources. Valuable experience in intermediate forest use has been gained in Latvia and other Baltic republics, as well as in the western Ukraine. Through thinning, around 40 m^3 of timber per hectare are obtained, which is 1.5–2 times more than obtained in the rest of the European regions of the USSR. The practice of intermediate forest use may yield up to 50% of the total wood procured.

Intensive development of the wood industry is reflected not only in the stabilization of wood cutting but also in a reduced growth in primary processing of timber. At present, a fuller utilization of raw wood means active substitution of all kinds of wood-based panels and paperboard for sawn wood materials. The data in *Table 12.3* show the development of wood processing.

Full use of wood and recovery of all waste materials are economically more promising and resourceful than an extensive build-up of wood logging. Sawnwood operations alone could provide about 45 million m^3 of recoverable wastes. Although the most efficient enterprises manage to utilize the raw wood with a factor as high as 0.92–0.94, the average figure for the industry as a whole is only slightly over 0.7. The fuller conversion of wood reduces the cost of final

Table 12.3. Development of wood processing.

	1940	*1965*	*1970*	*1975*	*1980*	*1981*	*1982*	*1983*
Sawnwood (million m^3)	35.4	111.0	116.4	116.2	98.2	98.1	97.5	97.0
Plywood (million m^3)	782	1756	2045	2196	2022	2035	2015	2103
Fiberboard (million m^2)	4.1	138	208	409	469	482	469	502
Wood particleboard (thousand m^3)	–	798	1991	3996	5118	5390	5583	5749
Pulp (thousand tons)	592	3234	5110	6815	7123	7319	7444	7913
Paper (thousand tons)	838	3231	4185	5215	5288	5399	5439	5667
including newsprint (billion m^2)	–	14.5	21.4	26.3	30.0	30.1	30.7	31.6
Cardboard (thousand tons)	153	1449	2516	3368	3445	3555	3539	3889

products and increases commercial resources, which in turn contributes to a most economical satisfaction of demand and allows an increase in the share of goods allocated to export.

The transportation facilities available for delivery of wood products are of great importance. The share of wood products in railway haulage has dropped, but is still rather high; in addition the share of wood in freight expenditures has decreased at a slower rate than has the share of weight, because the average haulage distance is increasing.

12.3. Trends in Technology in the Forest Industry

The forest industry is steadily increasing the level of mechanization of its jobs and operations. The statistics in *Table 12.4* show the increased number of mechanized production and transfer devices and machines installed at the logging, woodworking, and pulp and paper enterprises.

Logging sites are also witnessing an intensive mechanization of jobs and operations. The volume of mechanized operations as a percentage of the total work carried out in grading, and piling of wood has developed as shown in *Table 12.5*.

Table 12.4. Increased mechanization in the wood-working industry.

	1971	*1975*	*1979*	*1983*
Mechanized production lines	6228	8550	10377	11784
Transfer lines	612	1196	1626	2039

Table 12.5. Volume of mechanized operations as a percentage of work carried out.

	1970	*1975*	*1980*	*1983*
Grading	62	72	78	80
Piling	60	70	84	89

On the whole, 41.4% of the wood-logging jobs were mechanized in 1982, as compared with 40.5% in 1980. The main feature of technological change in wood-logging practice is the use of multipurpose forest machines, such as the feller-buncher, which reduces hard and hazardous manual operations on a logging site, greatly contributing to higher labor productivity.

In 1982 the logging enterprises of the Ministry of the Paper and Woodworking Industry used mechanical equipment for 16.3% of felling work, 23.4% of skidding work, and 17.5% of delimbing work. In many heavily wooded regions these figures, however, exceeded 50%. This is especially so in remote, labor-deficit regions of Siberia and the north of the European part of the USSR.

New machines considerably raise labor productivity, although the difficulties involved in mastering them somewhat hinder this process. Thus the best operators of the LP-19 feller-buncher handle 60000 m^3 or more a year, surpassing a rated standard, while the average annual output for this machine for the industry as a whole is about 2.5 times lower. However, experience in operation of these machines is being gradually gained and the repairing and maintenance services are being improved, so that machine outputs and utilization rates will yield better results. The machines themselves are being improved and brought up to date, and new types are making their appearance on wood-cutting sites.

Heavy, powerful machines prove most efficient on clear cutting sites with large-size trees where the ground is of high bearing capacity. Their use, however, unfavorably influences natural reforestation as machines destroy regrowth, damage the soil, and clutter up the site with cut debris. All this urgently calls for the design of "ecologically clear" machinery that does minimum damage to nature.

The labor efficiency of wood haulage depends both on power and loading capacity of vehicles and on the availability of adequate roads. The share of the all-year-round forest roads is growing, but a systematic and regular exploitation of all-year-round hard-surface roads is still an urgent problem. This problem becomes increasingly pressing because the average haulage distance to many important wood-procuring regions is becoming longer. This keeps transportation costs very high, thus determining, to a large extent, the prime cost of delivered wood. In many large wood-logging enterprises haulage accounts for about 50% of the cost, while the expenditure on road construction and purchasing of transport facilities amounts to 75% of the total industrial capital investment. The share of haulage operations in the total labor consumed on wood-cutting sites is 20–30%.

Between 1970 and 1983 the growth of capital investment in the timber industry was insignificant, the industry's share in the total industrial investment having decreased from 4.6% to 3.7%. Consequently attention was paid mainly to a more efficient use of the capital already allocated.

Supply of the wood industry with equipment and other means of production is increasing as quickly as the rate of growth of investment, which is slightly lower than those for industrial purposes as a whole. In the case of branches involving an intensive conversion of wood, investments are even somewhat higher than the industrial average (*Table 12.6*).

Table 12.6. Growth of investment in equipment.

	1970	*1975*	*1980*	*1981*	*1982*	*1983*
Industry, total	100	151	217	232	248	266
Wood industry	100	145	199	210	223	238
Wood logging	100	133	166	173	183	192
Woodworking	100	150	206	220	232	246
Pulp and paper production	100	153	227	242	259	281

This level of investment was maintained in spite of their rather intensive rate of depreciation: for example, in 1983 the timber industry wrote off 2.6% of assets, while industry as a whole, 1.2%. The reason is a high degree of depreciation in harvesting, which amounts to 6.1% and reflects the necessity to move into new wood-cutting areas, thus abandoning roads and houses. On the other hand, the rate for woodworking is close to the average for industry (1.8%), while for pulp and paper it is as low as 0.7%.

The capital per head of wood-logging jobs was somewhat lower than the average, being 9 900 rubles in 1982, but it still showed an accelerated growth due to the supply of expensive and efficient machines. In 1981–1982 the same ratio of sawmill and woodworking enterprises rose from 8 600 to 9 500 rubles. Labor productivity of the industry is growing, although somewhat lagging behind that in more advanced industries, with rather high increment rates being observed at enterprises engaged in the intensive working of wood and lowest rates being typical of wood logging (*Table 12.7*).

Table 12.7. Labor productivity.

	1940	*1965*	*1970*	*1975*	*1980*	*1981*	*1982*	*1983*
Industry, total	100	372	492	657	769	789	806	835
Wood industry	100	269	348	450	493	510	525	543
Wood logging	100	217	254	315	322	326	337	339
Woodworking	100	243	322	414	468	487	505	522
Pulp and paper production	100	300	405	539	568	588	599	636

The total annual output per worker (the amount of timber extracted divided by the number of workers engaged in cutting and extraction operations) rose from 208 m^3 to 571 m^3 a year between 1950 and 1975. It dropped somewhat, however, to 557 m^3 in 1980 in new timber exploitation regions, with the average volume of decreasing and haulage distance increasing. Introduction of new, efficient equipment and improvement of the processes made it possible to change this trend considerably, and 1982 again saw the level of 570 m^3. The expenditure structure of the wood industry show that it is a relatively labor- and capital-intensive industry. The share of depreciation and cost of wages are also large. On the other hand, the industry's branches are highly autonomous, which means that it is less dependent on other industries for raw and other materials. *Table 12.8* illustrates the situation in 1982.

Table 12.8. Expenditure structure of the wood industry (percentage of the total).

	Raw and other materials	*Fuel*	*Power*	*Amortization*	*Wages + social insurance*	*Other expenditure*
Industry, total	66.1	4.1	2.8	7.6	14.5	4.9
Wood industry	50.6	4.0	2.6	10.0	24.3	8.5
Wood logging	28.5	4.6	1.3	13.5	34.6	17.5
Woodworking	61.1	2.5	2.0	6.2	23.1	5.1
Pulp and paper production	58.0	6.4	5.9	13.9	13.2	2.6

The profits of enterprises in the wood industry are, on average, lower than those in the industry as a whole. In addition, harvesting has long shown no profits and has received state subsidy from the budget. It was as late as 1982, when the prices for timber were raised somewhat, that this branch exhibited a favorable balance and profitability.

12.4. Soviet Exports of Forest Products

"Traditional" is a most appropriate word when speaking of forest product exports from the USSR. Even before the Revolution in 1917, Russia was one of the main suppliers of timber to the world market. Later, in 1921, the young Soviet Republic began its foreign trade with shiploads of plywood and sawn lumber. Since then the All-Union Foreign Trade Association ("Exportles"), which carries out practically all Soviet foreign trade in timber and pulp and paper goods, has become the world's largest timber trade company.

Russia's wood exports (within the present territory) were 10.9 million m^3 in 1913, including 4.8 million m^3 of sawn timber, 60 million m^3 of plywood, 3.9 million m^3 of pulpwood and pit props, and 1.3 million m^3 of coniferous sawn logs. In 1930 the export of forest products from the USSR exceeded the pre-Revolution level and amounted to 13.0 million m^3. The trade expanded owing to both an increased volume of exported goods and to an increased number of commodity items. New regions were involved in export production. From the end of World War II up to 1959, timber exports from the USSR were lower than those in the 1930s. This decline was caused by the home demand in building materials for restoration and development of the war-torn national economy. However, with the restoration period nearing its completion, exports from the USSR gained strength at an increasing pace and became more diversified (*Table 12.9*).

The statistics in *Table 12.9* are evidence of the positive changes taking place in Soviet exports of forest products. These consist of the stabilization of, or even some reduction in, goods requiring little processing and in a parallel increase in the export of pulp and paper and other intensively worked wood products. As for pulp and paper goods, the USSR's share of the world market is increasing, but still remains at the rather low level of less than 10% of world total (*Table 12.10*).

Table 12.9. Soviet exports of forest products.

	1930	*1940*	*1950*	*1960*	*1970*	*1980*	*1981*	*1982*	*1983*	*1984*
Coniferous saw logs[a]	1.5	.1	.1	1.5	7.3	6.5	6.2	6.2	7.4	7.7
Pulpwood[a]	3.3	.6	.1	1.6	6.0	5.7	5.8	5.4	6.3	6.7
Sawn timber[a]	4.5	.4	1.0	5.0	8.0	7.1	6.9	7.2	7.3	7.2
Plywood[b]	76	17	48	129	281	314	324	336	328	317
Wood fiberboard[a]	–	–	–	–	42	91	96	83	79	77
Wood particleboard[b]	–	–	–	2	145	332	362	334	328	348
Furniture[c]	–	–	–	1	7	26	28	24	20	23
Pulp[c]	–	–	68	244	448	821	824	888	1.012	1.010
Paper[d]	3	1	30	122	475	647	659	691	669	674
Paper board[d]	–	–	–	1	247	372	388	325	365	372

[a] Million m^3. [b] Thousand m^3. [c] Million rubles. [d] Thousand tons.

Table 12.10. World and USSR exports of forest products.

	1970			*1981*			*1983*		
Product	*World*	*USSR*	*USSR as %*	*World*	*USSR*	*USSR as %*	*World*	*USSR*	*USSR as %*
Coniferous sawn goods[a]	49.3	8.0	16	60.8	6.7	11	70.8	7.1	10
Pulpwood[a]	26.6	6.6	25	41.6	5.8	14	35.3	6.3	18
Coniferous saw logs[a]	24.4	7.4	30	23.0	6.2	27	19.4	7.4	25
Plywood[b]	4.753	.281	5.9	7.013	.324	4.6	7.5	.328	4.3
Wood fiberboard[b]	2.062	.139	6.7	2.415	.319	13.2	22.00	.250	12
Wood particleboard[b]	2.048	.145	7.0	5.153	.362	7.0	52.00	.328	6.3
Pulp[c]	13.490	.448	3.2	17.589	.844	4.8	20.00	1.012	4.9
Newsprint[c]	10.619	.260	2.4	13.165	.322	2.4	12.1	3.61	3.0

[a] Million m^3. [b] Thousand m^3. [c] Thousand tons.

The bulk of exports of roundwood timber are from the Asian part of the USSR, especially in the case of saw logs (about 80%). At the same time the Asian share in exports of sawn goods and pulp is insignificant – only 2–3%. All wood panels, paper, and paperboard are exported from the European part of the country.

The major importers of Soviet sawn timber are European countries: East Germany (18% of total Soviet exports in 1983), Britain (17%), Hungary (9%), West Germany (8%), Italy (5%), France (4%), the Netherlands (4%), and Belgium (3%). (In addition, Cuba imported 5% of total Soviet sawn timber exports in 1983.) The European market is also the basic one for Soviet export of wood-based boards and pulpwood, while Japan leads in purchasing coniferous saw logs (70% of Soviet exports in 1983). The USSR export of pulp and paper goods is delivered mainly to the European socialist countries (about two thirds).

When using the conversion factors for the volume of exported forest products applied by the Forestry Committee of FAO, one can estimate the total volume of raw wood equivalent exported from the USSR in 1983 as 37 million m^3. This is a mere 10% of the logging volume, which shows that the country's timber and paper industry is used mainly to meet domestic demand, with exports being of marginal importance.

Comparing the production and export of sawn lumber, an important export item, is further proof of a rather low share of exports (*Table 12.11*). The share of exports decreased from 41% in 1913 and 21% in 1930, to 7% in the 1980s.

Table 12.11. Production and export of sawn lumber (million m^3).

	1913	*1930*	*1960*	*1970*	*1980*	*1982*	*1983*
Production	11.7	21.9	105.6	116.4	98.2	97.5	97.0
Export	4.8	4.5	4.9	8.0	7.1	7.2	7.3
Export quotient (%)	41.0	21.0	4.7	6.9	7.2	7.4	7.6

The USSR's export share is especially moderate when compared with those of such wood-exporting countries as Canada, Sweden, Finland, and Austria, whose exported raw material equivalent amounts to 60–80% of the logging volume, with an export share of production of the main forest products reaching 90%.

In recent years the share of forest products in the total export revenue has been decreasing. The significance of forest products is, however, relatively greater in trade with the market economy countries. If one takes into consideration a decrease in prices for some other export goods, especially since 1982, and the persistent trend for higher prices of forest products, their significance in generating export revenue is enhanced. *Table 12.12* shows the values of the main forest products exported by the USSR between 1930 and 1983.

Thus the share of forest products in Soviet exports dropped to 3% in 1983, whereas in the 1960s and 1970s it varied from 5% to 6% and normally exceeded 10% in the pre-World War II period. The share of higher value-added products (pulp and paper and wood panels) is gradually increasing, but still remains at a relatively low level (about one third).

Soviet trade organizations extensively use the services of brokers and agents while dealing in foreign markets and at the same time develop close ties with importers and final users.

The USSR relies more and more on modern methods of forest products transportation to their clients, including containerization and the delivery of sawn goods in block packages, which give additional advantages.

Having at its disposal a wealth of natural and production resources, the USSR does not depend on imports but it is, nevertheless, interested in various purchases, including wood products, in accordance with the rational and effective international division of labor. The development of exports gives rise to,

Table 12.12. The value of forest products exported by the USSR (million rubles).

	1930	*1940*	*1950*	*1960*	*1970*	*1980*	*1981*	*1982*	*1983*
Total USSR exports	810	240	1660	5000	11500	49600	57100	63200	67900
Forest products[a]	134	15	50	275	749	2009	1893	1791	1916
Roundwood	57	8	8	55	254	615	531	451	499
Saw logs	11	.5	1.4	21	142	389	307	249	299
Pulpwood	25	4.3	1.7	16	70	153	152	133	138
Sawn lumber	67	6	26	165	300	784	712	661	694
Plywood	6	.9	4	13	31	77	80	81	83
Pulp	–	–	5	23	54	221	242	258	280
Paper	.2	.1	6	17	65	172	188	212	217
Paperboard	–	–	–	–	30	80	86	76	90
Fiberboard	–	–	–	–	8	30	37	33	32
Wood particle-board	–	–	–	–	8	19	22	21	21
Furniture	–	–	–	1	7	26	28	24	20

[a]Less the three bottom items.

and stimulates, the flow of imported goods, which is confirmed by the increasing value of forest products imported by the USSR (*Table 12.13*).

The increasing Soviet timber imports are largely made up of an assortment of pulp and paper products and of products of southern origin such as veneer logs and veneer of tropical wood species, cork bark, parquet, and sawn hardwoods.

To use the vast wood resources of the USSR in the process of economic development and to promote the national export potential requires considerable production capacities, capital investments, and manpower. This task can be accomplished through additional resources and the introduction of new types of international cooperation. These include the use of foreign manpower for logging in the USSR, the construction and modernization of timber

Table 12.13. Value of forest products imported by the USSR (million rubles).

	1930	*1940*	*1950*	*1960*	*1970*	*1980*	*1981*	*1982*	*1983*
Total USSR imports	830	250	1300	5100	10600	44500	52600	56400	59600
Forest products[a]	14	6	51	94	224	889	939	884	797
Pulp	4	3	.2	13	49	89	129	102	99
Paper and paper board	7	1	6	22	99	456	431	459	365
Paper and paper-board products	–	1	.3	9	37	213	230	202	218
Furniture	–	.5	.5	59	179	420	517	578	480

[a]Less the two bottom items.

enterprises by foreign companies, which act as general contractors, as well as compensation agreements. Contracts for such cooperation normally stipulate that a foreign partner provides equipment or services, which are later compensated for by output produced.

At present, under intergovernmental agreements the USSR employs Bulgarian workers in logging jobs. The Soviet side provides wood-cutting equipment, fuel and energy, vehicles, tools, and spare parts, as well as services; it also ensures that the logging, reforestation, and construction regulations are duly observed. The Bulgarian side sends manpower to the logging areas and does the work of logging, construction, and reforestation. The expenditures on wages for Bulgarian workers are compensated with raw wood supplies, the share of wood supplied being estimated from the ratio of the partners' expenditures. The deliveries under the agreements concluded are classified as noncommercial and thus are not included in export statistics.

Also of interest is the experience, although as yet limited, of inviting foreign companies to undertake construction and modernization of timber and pulp and paper turnkey projects in the USSR, when the companies act as general contractors. For example, in the 1970s Finnish companies built the Lake Pyaozero lumber logging establishment in the Karelia border district; in 1983 they completed the modernization of the Svetogorsk pulp and paper combine in the same region. The Finnish side was paid with additional supplies of timber from the USSR.

Since the late 1960s the Soviet wood industry has established cooperation with Japan on the basis of compensation agreements. The latter provides the USSR with special-purpose credits for purchases of Japanese-made logging equipment, machines, vehicle spare parts and materials, with credits being repaid by Soviet supplies of chips and sawn lumber. The annual deliveries under this agreement exceed 2 million m^3.

A multilateral, compensation-based project is a large pulp mill in Ust-Ilimsk, put into operation in 1982 and having a capacity of 500000 tons of bleached sulfite pulp. The main equipment for this mill was supplied by French and Swedish companies, and the credits for construction were granted by French banks and some European socialist countries. The credits are repaid through pulp deliveries from Ust-Ilimsk to the socialist countries and France as well as to other West European countries.

The USSR takes part in building projects of wood and pulp and paper industry abroad. For example, the Soviet foreign trade association "Neftekhimpromexport" has built a pulp mill of 140000 tons capacity and plants for manufacturing capacitor and cigarette paper in Bulgaria and a factory for making container corrugated cardboard of 100000 tons capacity in Romania. The USSR also took part in joint projects in Czechoslovakia: in the modernization of a large pulp and paper combine in Ruzomberok, jointly with the Canadian company "Simons"; and in the construction of a mill for the manufacture of hardwood beech pulp in Paskov, a consortium deal with the Finnish group "Metex".

Such agreements for specialization and cooperative production are gaining greater importance. The CMEA countries have concluded over 1000 bilateral and about 120 multilateral agreements of this kind. Although the wood industry is not of top priority in such cooperation, a number of agreements are operative in the field of woodworking and pulp and paper production.

A good example of reliable international cooperation is provided by intergovernmental agreements on economic, industrial, and scientific and technological cooperation concluded between the USSR and a number of Western countries. An example of the wide scope of research problems is provided by the program for economic and industrial cooperation between the USSR and Sweden for the 1981–1990 period, which comprises a wide range of projects: machine tree-planting and wood-tending work, genetic methods for increased efficiency of forest growth, and mechanization of various production processes applied at logging, woodworking, and pulp and paper enterprises, including the commercial use of wastes and the development of new equipment.

The following types of cooperation also hold considerable promise: joint developments, workshops, and symposia on pressing scientific and technological problems; joint tests of new equipment; exchange of licenses and know-how; commercial cooperation; and in particular joint marketing of finished products.

12.5. Conclusions

An increasing relative deficit in economically available coniferous timber in the world gives rise to the problem of finding additional resources capable of meeting increasing future demand. Some of the solutions to this problem could be found in setting up forest plantations with shorter periods of crop rotation in countries of the warm and hot belts and intensification of forestry in forest-rich and forest-poor countries of the moderate belt. This trend, however, implies much expenditure with the resultant higher costs of wood products without relieving the shortage of the most valuable, close-grained coniferous wood grown in northern regions.

The extra demand in the world market for wood products can be successfully met, among others, from resources in the USSR, which does not yet make full use of its available forest resources. The USSR is a reliable trade partner aiming at long-term cooperation and the development of stable trade relations, and its foreign trade policy is free from market fluctuations. The planned Soviet economy, with its controlled allocation of capital investment, materials, equipment, and manpower, favors large-scale, stable, mutual ties with foreign markets, due, above all, to the establishment of export-oriented production capacities.

Being a large and reliable exporter the USSR is prepared to share the responsibility for a steady market, alleviating both shortages and production, and to maintain the general competitiveness of forest products. It is willing to

cooperate with all partners interested in mutually advantageous relations, although this willingness is, to a considerable extent, dependent on the sincere and active response from these partners. An increase in its export volume, and the expansion of the range of exported items against the background of a huge domestic consumption, will invariably be in line with its partners' interests, in reasonable correlation with the world market's supply and demand, and in line with economic imperatives for the development of international cooperation in the field of foreign trade. The USSR continues to be mainly a world supplier of sawnwood and roundwood; but the growth of production and consumption of forest products obtained from the intensive higher-degree processing of wood will stimulate both the export and import of these goods, thus further developing the mutually advantageous exchanges based on the rational international division of labor and specialization in the wood industry.

CHAPTER 13

Historical Analysis: International Trade in Forest Products

A. Francescon and A. Nagy

13.1. Introduction

The primary goal of the IIASA Forest Sector Project was to study the long-term development of the world market of wood products, and to look at the competitive situation in the future of a detailed bilateral trade-flow system. It seemed evident to us that this could only be done if an analysis had previously been prepared on how the pattern of international trade in forest products has changed in the past over a 15–20-year time period.

The construction of the data base for such an exercise proved to be very difficult as well as time- and energy-consuming. For this reason it was decided to make some short cuts and simplifications in the data base (see Francescon *et al.*, 1983: Appendix I). As a consequence, the data we have used are rather weak in two respects:

(1) In their representation of intraregional Eastern European trade, which we expect to be much higher than indicated.
(2) Trade between developing regions may not be well reported by either exporters or importers, and thus the data we have used underestimate this trade.

This chapter consists of two parts: analyzing different aspects of the structural characteristics of trade in wood products and their evolution over time, and studying some of the factors influencing bilateral trade patterns. The first part (Section 13.2), written by Ann Francescon, studies the structure of past trade flows and their changes over time by analyzing various types of trade shares. For each given product the import and export market trade shares are examined; this reveals the importance of different importing and exporting regions. Then, to understand the pattern of major bilateral

flows and how this has changed, the trade flows are examined as a percentage of total world trade in a product. This kind of analysis builds up a useful picture of historical patterns of trade, as well as tendencies which can be observed in the share structures of different commodity groups.

The second part (Section 13.3), written by András Nagy, concentrates on measuring the influence that trade policy has had on historical trade patterns by studying the trade intensities of the major bilateral flows. Trade-intensity analysis divides the factors influencing trade flows into two categories: on the one hand, the "push" of the exporting region and the "pull" of the importing region, expressing the trading potentials of the partners; and on the other, the particular factors regulating bilateral relations, such as distance, trade policy measures, discrimination, integration, historical links, etc. Intensity indicators try to capture the changing behavior of the second group of factors and measure their influence on the bilateral allocation of trade for different commodity groups. They also indicate the inertia or flexibility of these structures and their patterns of change. Intensity coefficients can measure, for example, the effects of trade liberalization and of integration and disintegration processes over the past two decades.

It may be useful to introduce here a few terms and notations further applied in the study of the structure of international trade.

International trade of a given product can be presented in trade-flow tables, where rows represent the allocation of exports among countries and columns the origin of imports. The entries stand both for exports and imports, i.e., the exports from country i to country j are assumed to be equal to the imports of country j from country i, and therefore the corresponding data are called "trade flow", a neutral expression meaning both.

Trade flows in this sense represent commercial transactions, where even if the volumes in physical units are the same, the values paid by the importers and received by the exporters are in reality not the same.

The trade flows by commodities and by countries constitute a system of international trade, the structure of which can be analyzed in several ways. The most simple of these consists of establishing the proportions of the parts to the system as a whole, expressed as percentages of the latter. In this case, we have one kind of "share structure" which can be defined as:

$$Z_{ijk} = \frac{X_{ijk}}{X_{..k}}$$

where Z_{ijk} is the share of world trade in commodity k that is exported from country i to country j; X_{ijk} is the trade flow of commodity k from country i to country j; and $X_{..k}$ is the total world trade in commodity k. A structure, however, may be characterized in several other ways, for example, by its divergence from another structure, constructed according to certain principles.

If total imports of commodity k by country j is $X_{.jk}$, then the import share index

$$\alpha_{ijk} = \frac{X_{ijk}}{X_{.jk}}$$

will determine a system of n^2 structural coefficients (n being the number of countries), the column totals of which equal unity. Evidently, with the aid of the α_{ijk} import shares it is possible to construct a table of trade flows, provided that the size of total imports ($X_{.jk}$) is given. This, of course, also determines the total exports by countries, since

$$X_{i.k} = \sum_{j=1}^{n} \alpha_{ijk} X_{.jk}$$

The degree of freedom of a structure as determined by the α_{ijk} structural coefficients is n, or equal to the number of countries in the system. This means that when one positive element is given for each column, all flows can be unequivocally determined, and the whole table of trade flows can be filled out.

Similarly, the distribution of exports by countries may also be obtained:

$$\beta_{ijk} = \frac{X_{ijk}}{X_{i.k}}$$

It is also possible to construct from this the individual flows, as well as the total imports. This structure has similarly n degrees of freedom; and when one positive flow is given for each row, the values of all flows can be obtained.

The structures determined by α_{ijk} and β_{ijk} are both subordinated, in the sense used by Martin-Curtoud (1965), to the structure

$$Z_{ijk} = \frac{X_{ijk}}{X_{..k}}$$

i.e., to the shares in total world trade. For this structure the degree of freedom is one; in other words, it is much more rigid.

In international trade modeling, import share structures are most frequently used in practice. In this case it is assumed that in foreign trade projections total imports of the various countries is the more stable element, as it is determined by the estimated levels of consumptions, investments, and domestic production. It is also assumed that import demand is the determining factor of foreign trade and consequently the exports of a country are determined by the imports of its trading partners. (A critical appraisal of this approach can be found in Nagy, 1983b).

There is no theoretical reason why we should, in the explanation of economic behavior or processes, attribute greater weight to demand than to supply; this is also true for the case of international trade. Moreover, not only theoretical considerations but also applied analysis have shown that, in the generation of trade flows, the "pull" of demand has no more of a role to play than the "push" of supply. According to the results of gravitational models (see Linnemann, 1966; Nagy, 1979), the "push" effect of the exporters' supply was always stronger than the "pull" of the importers' demand.

13.2. Share Structure Analysis

Share structure analysis can study the patterns of trade flows by *commodity* or by *region*. In other words, we can examine which are the major importers/exporters for a given product or which are the major products exported/imported by a given region. The following analysis is organized by commodities.

For each commodity, we first give an overview by describing what proportion of world trade is trade between socialist, developed, and developing regions. This can be done by examining a *summary* of the Z_{ijk} share structure table (see above for a definition of Z_{ijk}). An example of a summary table is given in *Table 13.1* (the regional notation is given in Appendix 13A below).

Table 13.1. A summary table.

Coniferous logs	*TDD*	*TSC*	*TDG*	*TWO*
TDD	56.37	0.31	6.89	63.57
TSC	18.81	0.11	0.38	19.30
TDG	13.33	0.	3.80	17.13
TWO	88.51	0.41	11.08	100.00

Thus we can see, for example, that trade in coniferous logs between developed regions covered 56% of world trade in 1981. A time series of this and the other major shares in the table can be plotted cumulatively as in *Figure 13B.5* (see Appendix 13B, where all the figures are given) to show how the proportion of trade between these three groups of regions has changed over time. Note that exports from developing regions are always shown by the shaded part of the graph, while the unshaded part represents the proportion of world exports originating from developed regions. Since only the major shares in the above table are plotted, the cumulative graph does not quite cover 100% of world trade.

Following this overview we then proceed by looking at the *detailed* Z_{ijk} share structure table. Given the Z_{ijk} share structure of a particular commodity for 1962–1981, we can check the total import and total export shares ($Z_{.jk}$ and $Z_{i.k}$, respectively) of each region; thus major importers and exporters of the product are revealed. Trends in the import and export share structure

are revealed by plotting the largest shares over time. (These graphs are to be found in Appendix 13B.) We can also check whether regions have been net importers or net exporters. It is then useful to study the α and β (import and export) share structures of the product. The former indicate for a given importer what proportion of its imports come from different regions. The latter indicate for a given exporter what proportion of its exports are sent to different regions. Thus for each major importing and exporting region the importance of different trading partners is assessed.

This, however, does not indicate the importance of *individual trade flows* with respect to overall trade in a product; for this purpose, the Z_{ijk} share structure is examined to reveal major bilateral flows and their changing pattern over the last two decades. For simplicity, we have noted only those flows whose share is greater than 1% of world trade during any one of six selected years. This information is presented for each product in the form of a table, and also the major flows are plotted on a world map, which can be found in Appendix 13B.

We begin with an overview of all products and then consider each product separately.

13.2.1. Trade of all forest products

Looking at all the eleven commodity groups we have studied, we find that the total value of trade in 1981 was $52 billion. The percentage share of this covered by each product is given in *Table 13.2*.

Table 13.2. Percentage share covered by each product.

Coniferous logs	5.1	Panels	8.3
Nonconiferous logs	4.8	Pulp	19.2
Pulpwood	1.4	Newsprint	11.5
Fuelwood	0.4	Other printing and writing paper	10.6
Coniferous sawnwood	14.7	Other paper and board	18.4
Nonconiferous sawnwood	5.6		

If we look at the share of the total value of trade that each product has had over the last 20 years, we find that in the case of nonconiferous logs and coniferous sawnwood this has decreased (by nearly one half and one third, respectively). On the other hand, coniferous logs, "other printing and writing paper", and "other paper and board" have all become more important in terms of value (their shares have doubled, tripled, and increased by half, respectively). Very little change is observed for pulpwood and fuelwood, but panels and nonconiferous sawnwood have slightly increased their share. The share for pulp has remained around 20%, apart from the late 1970s, when it dropped to around 15%, while the share for newsprint decreased to a minimum in the early 1970s, after which it increased.

Overall, a very large proportion of trade in forest products has come from developed regions throughout the period – over 85% in 1963 but decreasing to 78% in 1980 (see the unshaded area of *Figure 13B.1*). In contrast, the shaded area of *Figure 13B.1* shows how the developing regions' share of exports has increased slightly up to 1980. This is due to both increased trade between developing regions and their increased exports to the developed world. It is noticeable that in 1973 the latter flow was at its highest, while trade in the reverse direction was at its lowest, but on average, the world share of these flows has remained at around 10% each.

North America and Northern Europe have been the major exporters, covering over half the world's exports (see *Figure 13B.2*). The share of the former remained around 36% until 1972, after which it dropped to a lower level, and only picked up again in 1981. The latter has always been the second largest exporter, but its share has dropped fairly steadily apart from a temporarily high level in 1974 and 1975. The third major exporter throughout – Western Europe – has been steadily increasing its share of the market, while Eastern Europe's share has changed little. The main exporter in the developing world has been the ASEAN group of countries. Its share has increased, particularly in 1973 when it overtook Eastern Europe as the fourth largest exporter, and peaked at 11% in 1979 but afterwards decreased. Its increased exports were sent mainly to Japan (see *Table 13.3*).

Table 13.3. Shares of world trade of major bilateral flows of all forest products (%).

From	*To*	*1962*	*1966*	*1970*	*1974*	*1978*	*1981*
WEU	WEU	9.96	10.19	11.82	14.39	15.80	16.85
NEU	WEU	23.45	20.96	19.22	18.99	15.70	15.86
NAM	NAM	22.99	19.95	15.68	13.30	17.27	15.60
NAM	WEU	7.55	7.71	8.98	7.71	6.89	8.08
NAM	JAP	2.14	3.51	6.01	5.54	5.23	5.40
EEU	WEU	5.99	5.60	4.45	3.76	3.47	2.86
NAM	LAM	1.94	2.21	2.38	2.22	1.76	2.57
ASE	JAP	1.95	2.27	3.41	3.52	3.16	2.21
AFR	WEU	3.80	3.64	3.22	2.80	2.53	2.16

Nearly half of all exports have gone to Western Europe throughout the last 20 years, while North America has decreased its imports by one third, but has remained the second major importer with an 18% share in 1981 (*Figure 13B.3*). (North America has remained a net exporter throughout the period.) Japan remained the third major importer, with an increased share around 10%, this coming mainly from North America and the ASEAN countries (*Table 13.3*). The share of imports by "other Asian countries" has more than doubled but still represents only 7% of world trade.

As *Table 13.3* and the corresponding map of major bilateral flows (*Figure 13B.4*) show, nearly 50% of world trade in forest products has always been covered by only three flows; namely intraregional Western European and North American trade, and Western European imports from Northern Europe (see *Table 13.3*). The first of these has nearly doubled its share of world trade

over the last 20 years, while both the others have decreased. The overall concentration of trade flows of forest products has also decreased slightly during the period (15 flows covered 80% of world trade in 1982, compared with 12 in 1962).

13.2.2. Coniferous logs

In 1981 trade in coniferous logs amounted to $2.7 billion, thus representing a fairly small proportion (5.1%) of world trade in forest products. *Figure 13B.5* shows a cumulative plot of the percentage of world exports of coniferous logs coming from socialist and developed regions (unshaded area) and from developing regions (shaded area). Within the unshaded area we see that the bulk of developed region exports is to other developed regions; a small amount goes to developing regions; and exports from socialist to developed regions accounts for one fifth of world trade. The shaded area portrays clearly the greatly increased role of developing countries as exporters (and as importers, since trade between developing countries has also increased).

Throughout the period from 1963 to 1981, North America remained by far the largest exporter of coniferous logs (with most of the exports coming from the USA) with a share of world trade over 40%, compared with a share of around 20% for the second major exporter – Eastern Europe. However, the former decreased sharply after 1973 from a high of 60% to around 40% in 1977, but has since increased to about 55% (*Figure 13B.6*). After the energy crisis, Eastern Europe's exports also appear to have dropped from a 30% high in 1974 to around 16%. The only region whose share sharply *increased* after 1973 is the ASEAN countries (from less than 2% to a high of 26% in 1979, but later decreasing to less than Eastern Europe's share). Both Western and Northern Europe have an export share less than 10% of world trade in coniferous logs. The former trades mainly within the region.

The major importer of coniferous logs throughout the period has been Japan. Its share increased between 1963 and 1968 from 60% to 87%, but there was a noticeable decrease after 1973 to a low of 70% in 1977 (*Figure 13B.7*). Corresponding to this decrease in Japan's imports is the increased imports of "other Asian countries", from 2% in 1973 to a high of 14% in 1978. Western Europe's imports dropped from 20% in 1963 to 8% in 1968 and remained around that level, but it remained a net importer.

Between 1963 and 1966 over 70% of North American exports went to Japan while 14% went to Oceania, but the latter dropped to less than 1% in 1966 while exports to Japan increased. Since 1966 over 80% of North America's exports have gone to Japan, but this percentage has been decreasing. North America's export share decreased after 1973 mainly due to lower trade with Japan. Over 80% of Eastern Europe exports also go to Japan (this proportion has been decreasing), with a small percentage to Northern and Western Europe (these percentages have been decreasing and increasing, respectively). Since the total shares of imports by Northern and Western Europe have remained fairly constant (*Figure 13B.7*), the reason for Eastern Europe's

decreased market share is therefore its lower trade with Japan. The ASEAN countries currently export coniferous logs predominantly to Japan and "other Asian countries" (over 65% and 25% of ASEAN exports, respectively).

13.2.3. Nonconiferous logs

World trade in nonconiferous logs was worth $2.5 billion in 1981; approximately 4.8% of trade in forest products. We see from *Figure 13B.8* that a major role has been and still is played by developing regions as exporters (shaded area). Also trade *between* developing regions is fairly high. Looking more closely at the shares of world trade of the major exporters over the last two decades (*Figure 13B.9*), we can see that the ASEAN countries and Africa are the most important. The former's share nearly doubled since 1963, to a high of 58% in 1979, but afterward dropped sharply. On the other hand, Africa's was nearly halved between 1963 and 1978 to about 20% but then sharply increased. "Other Asian countries" exports appear to fall by almost four fifths in 1969 and then remain under 4% of world exports.

Western Europe and Japan have been the largest importers of nonconiferous logs, throughout the period (around 40% of world imports each) (*Figure 13B.10*). The shares of both regions have fluctuated; moreover, when Japan's imports share is at its maximum in a cycle, Western Europe's is at its minimum, and vice versa. "Other Asian countries" became net importers in 1969 and steadily increased their imports to a maximum of 21% in 1978, but over the next three years, this share returned to its original level of around 5%.

Looking at the destinations of ASEAN exports, in 1975 over 60% went to Japan, with the rest mostly to "other Asian countries". This increased to over 86% in 1981. However, when ASEAN exports dropped in 1980 this was almost entirely due to the fall in "other Asian countries" imports. *Figure 13B.11* presents a summary of major trade flows on a world map. Since 1975 Africa has sent over 85% of its nonconiferous logs exports to Western Europe; thus the fluctuations in its exports follow closely the Western Europe import fluctuations. Looking at the share structure of Western Europe imports, over 55% comes from Africa and over 20% from within the region in 1981. These two proportions have remained fairly constant since 1975. Japanese imports originate mainly from ASEAN countries (around 85%) and a small (increasing) percentage comes from Oceania.

13.2.4. Coniferous sawnwood

Trade in coniferous sawnwood reached a level of $7.7 billion in 1981, accounting for nearly 15% of trade in forest products, making it the third largest commodity group. The import and export market of this product is dominated by developed regions, with less than 6% of exports originating from developing regions (see *Figure 13B.12* – shaded area).

North America, the major exporter, has increased its share of exports from 35% in the early 1960s to an average of 45% in the late 1970s (*Figure 13B.13*). However, its share does show cyclical movement, with a large drop occurring after 1973, picking up in 1976. These exports are mainly from Canada. Northern Europe's export share has remained around 27%, while Eastern Europe has steadily decreased its share by almost half to around 11%. The only major developing exporter is Latin America; during the 1970s its share decreased from 5% to 1%, so that in 1981 it was a net importer.

By far the largest importer is Western Europe, although its share has dropped from 70% to 50% during the last two decades (*Figure 13B.14*). This share has fluctuated up and down, but not so noticeably as that of North America, the second largest importer. (North America has in fact remained a net exporter throughout the period.) Peaks in North America's import share correspond to a low level of Western Europe's import share, and vice versa (the last two peaks being in 1972 and 1978). Together, these two regions accounted for 75% of imports in 1981.

Looking at the major bilateral flows, *Table 13.4* shows us that trade within North America has been one of the largest throughout the period. Over 50% of North American exports have been traded within the region and these are in fact mostly Canadian exports to the USA.

Table 13.4. Shares of world trade of major bilateral flows of coniferous sawnwood (%).

From	To	*1962*	*1966*	*1970*	*1974*	*1978*	*1981*
NAM	NAM	21.83	19.79	20.01	18.95	37.20	26.22
NEU	WEU	28.55	25.93	26.22	29.68	21.68	21.48
WEU	WEU	10.99	7.86	8.54	9.38	8.33	10.34
EEU	WEU	18.04	19.08	14.08	12.03	9.22	8.27
NAM	WEU	7.75	10.86	10.09	8.26	5.65	7.44
NAM	JAP	1.97	2.53	5.61	5.99	5.20	7.00
NEU	AFR	–	–	–	–	1.11	2.38

North America also exports to Western Europe, Japan, and Oceania. The second flow represented 7% of world trade in 1981 compared with only 2% in 1962 (*Table 13.4*), thus being a major component of North America's increased exports. After 1980, North America also began to increase its exports to Latin America, Africa, and "other Asian countries".

Trade in coniferous sawnwood is strongly concentrated, with only five or six flows accounting for over 80% of trade throughout the last two decades. Northern and Eastern Europe's exports to Western Europe have been consistently among these major flows, although both have decreased slightly, thus accounting for the decreased export shares of both of these regions. Throughout the period over 75% of Northern Europe's exports went to Western Europe, but this has gradually decreased as an increased proportion started going to Africa, "other Asian countries", and trade within the region.

Looking at the pattern of Western European imports, we can also see that an increasing proportion has been from trade within the region, and this has also remained a major flow of coniferous sawnwood, being approximately 8–10% of world trade in the last two decades.

13.2.5. Nonconiferous sawnwood

In 1981 the value of trade in nonconiferous sawnwood was $2.9 billion, representing 5.6% of world trade in forest products. The proportion of exports coming from developing regions has been steadily increasing (see shaded area in *Figure 13B.15*) from 45% in 1963 to 55% in 1981. The bulk of this has gone to developed regions, although trade between developing regions is also fairly high – around 14% before 1973, increasing to 17% afterwards.

The ASEAN group of countries are, as expected, the largest exporters; their share has fluctuated cyclically, but has also more than quadrupled since 1962, up to a level of 37% in 1981 (*Figure 13B.16*). The other important developing exporters are Africa and Latin America – the former's share decreased by more than half to a 1981 level of 6%, while the latter's remained around 6%. North America had the largest export share in 1962, but this dropped by half in 1973 to a low of 10% and only after five years began to recover to 18%, the second largest share in 1981. Western and Eastern Europe export around 15% each of world trade in nonconiferous logs.

The major importer throughout the period was Western Europe; its trade share fluctuated around 55% (*Figure 13B.17*). North America steadily decreased its share of imports from 24% in 1962 to 11% in 1981. Up to 1971 it was a net importer, but then switched to being a net exporter.

The ASEAN countries export mainly to Western Europe (over 50% of their exports throughout the period). The *proportion* of their exports going to North America, Oceania, and Africa has tended to decrease over the past two decades, while the proportion of trade to other countries within the region has more than quadrupled since 1970.

North America has sent an increasing proportion of its exports, much of which originated in the USA, to Western Europe over the last two decades (50% in 1981), while the proportion traded within the region has decreased to 30% in 1981. The proportion of North America's imports from within the region and from Latin America and the ASEAN countries has remained about the same. There is a high level of trade within Western Europe; this is the second largest source of that region's imports after the ASEAN countries. Eastern Europe has exported mainly to Western Europe,

Overall, trade in this product is much less concentrated than other forest products previously mentioned; over 16 flows accounted for 80% of world trade, decreasing to 13 flows during the late 1970s.

13.2.6. Panels

The value of trade of panels in 1981 was approximately $4.4 billion, representing 8.3% of world trade in forest products. A major but decreasing proportion of this came from developed regions (85% in 1962, 68% in 1981). This can be seen by the unshaded area in *Figure 13B.18*. The shaded area indicates developing regions' exports – both to developed and other developing regions – which have been increasing due to increasing industrialization of the developing world. After 1973 the trade within developing regions noticeably increased to 13% of world trade while their exports to developed regions decreased.

By far the largest exporter and (net) importer of panels is Western Europe (*Figures 13B.19* and *13B.20*). This intraregional trade flow has been increasing from 22% of world trade in 1962 to 28% in 1981 (*Table 13.5*). It represents the bulk of Western European countries' exports, but only 40–50% of their imports. Other regions from which they import panels are mainly Northern Europe, North America, the ASEAN countries, and Eastern Europe. The ASEAN countries accounted for an increasing share of Western Europe imports during the 1970s. This is one of the main reasons for ASEAN's export share quadrupling since 1962, to 16% in 1981, i.e., the second largest exporter of panels.

Table 13.5. Shares of world trade of major bilateral flows of panels (%).

From	*To*	*1962*	*1966*	*1970*	*1974*	*1978*	*1981*
WEU	WEU	21.88	23.75	23.64	25.76	28.10	27.98
NEU	WEU	17.87	13.51	13.28	10.70	8.46	8.44
NAM	WEU	4.35	6.28	7.37	6.70	7.21	7.70
NAM	NAM	8.42	6.83	4.42	7.24	5.19	5.58
ASE	ASI	–	–	–	1.35	2.89	4.84
ASE	WEU	–	–	1.71	3.01	4.54	4.65
ASI	NAM	1.13	4.51	7.10	5.63	7.27	3.54
ASE	NAM	4.74	5.26	3.93	2.82	2.22	3.38
EEU	WEU	5.11	5.02	4.13	3.63	3.15	2.89

Of the other major exporters of panels (see *Figure 13B.19*), Northern Europe's share has been nearly halved to 13% in 1981, although it remained a net exporter, mostly to Western Europe (the second largest bilateral flow) but also to other countries within the region. North America's share has fluctuated around 14% and, due to its steadily decreasing import share, was a net exporter for the first time in 1980. North American intraregional trade accounted for 60% of its exports in 1962, with the rest going mainly to Western Europe; this position was reversed in 1981, with 49% going to Western Europe. "Other Asian countries" steadily increased their exports to a maximum share of 15% in 1977, but this then decreased to 7%, and after 1980 they switched to

being net importers. *Table 13.5* confirms that their increased exports up to 1977 were mainly due to trade with North America, although they also exported intraregionally and to Western Europe.

Overall, trade in panels has become much less concentrated during the last two decades; nine flows accounted for over 80% of world trade in 1962, compared with 15 during the 1970s. This is much less concentrated than flows of raw material but similar to the concentration of flows of nonconiferous sawnwood and "other paper and board".

13.2.7. Pulp

Pulp has the largest value of trade of the eleven forest products studied, with a 19.2% world share in 1981 amounting to $10 billion. Throughout the last two decades over 85% of exports came from developed regions (*Figure 13B.21*), although the share from developing regions has increased slightly to 8% in 1981. *Figure 13B.22* shows that in 1967 North America overtook Northern Europe as the largest exporter and, apart from a drop during 1972 and 1973, continued to increase its share to 54% in 1981 (from 41% in 1962). Meanwhile Northern Europe's export share nearly halved to 25% in 1981, with a small upturn in 1973. Together these two regions have accounted for over three-quarters of world exports. Of the developing exporters, Latin America is the largest, its share having increased from less than 1% in the early 1960s to 5%. There is also a small level of exports from Africa.

Trade in pulp is strongly concentrated, there being only eight bilateral flows in 1981 covering 80% of world trade. This number was even fewer in 1962 – only five flows. The reason for this is that there is one major importer. As with many other products, this is Western Europe, covering over 50% of world imports, although its share has decreased slightly (*Figure 13B.23*).

The second largest importer is North America. In fact this is all that the USA imports from Canada, and its share has slightly decreased from 26% in 1962 to 19% in 1981. Of the smaller importers, Japan has nearly doubled it share to 9% in 1981, while "other Asian countries" and Eastern Europe have slightly increased their import share to 5% each.

Western European imports, Canada-to-USA trade, and the intraregional trade of Western Europe have always been the largest bilateral flows of pulp, accounting for 77% of world trade in 1962 but only 65% in 1981. Intraregional Western Europe trade accounts for over 85% of Western Europe exports, but in 1981 only amounted to 15% of their imports. Their major sources of pulp have been Northern Europe (the proportion imported from here has decreased from 67% in 1962 to 38% in 1981) and North America (this trade flow has increased to 37% of Western Europe's imports by 1981, from a level of 18% in 1961), but a small amount also comes from Latin America.

In 1981, 36% and 33% of North America's pulp exports were accounted for by its trade with Western Europe and within the region, respectively, but some were also sent to Japan, Latin America, and "other Asian countries". The proportion going to Western Europe has increased from 25% in 1962, while

intraregional trade decreased from 55% but accounted for nearly all North American imports. The reason for North America's increased exports is its higher trade with Western Europe and Japan. This is shown on the world map of major flows of pulp (*Figure 13B.24*) by the fact that these trade flows represent twice the share of total trade in 1981 than in 1962.

As noted above, Northern European exports to Western Europe have decreased, this being the major factor in the former's declining export share. Latin America's increased export share is due to higher trade with Western Europe; in 1979 this was over 1% of world trade for the first time, and in this year Latin America became a net exporter.

Japan has been the third largest importer of pulp throughout the last two decades, with a share starting around 4% and doubling by the end of the 1970s, owing to increased trade with North America. It is closely followed by "other Asian countries" and Eastern Europe.

13.2.8. Newsprint

In 1981 the value of trade of newsprint was $6.0 billion, representing 11.3% of world trade in forest products, the fourth largest of the commodity groups studied. Trade in this product is the most strongly concentrated of all the products studied, with only four flows covering over 80% of world trade, namely Canada-to-USA trade, Western Europe imports from Northern Europe and North America, and Latin American imports from North America (49%, 21%, 6%, and 5%, respectively, in 1981). It is noticeable also that developing regions play a very minor role as newsprint exporters, but imported about 16% of world trade in 1981. Their imports increased particularly between 1973 and 1974.

North America used to cover over 70% of world newsprint exports during the 1960s, (with nearly all exports coming from Canada) but this share decreased noticeably during the mid-1970s to a low of 62% (*Figure 13B.25*). At the same time, this was matched by increasing Northern European exports with a high level of 29% in 1974. When North American exports picked up in 1978 this was matched by a drop in the former's exports; this complementary fluctuation in shares for the two major regions continued for the rest of the decade, indicating the competition between them on the export market. North America has in fact remained a net exporter of newsprint since its share of the import market also decreased during this period, particularly during the early 1970s (*Figure 13B.26*). In 1962 it covered 66% of world imports but reached a low of 48% in 1974 and then remained around that level. Canada → USA trade has always accounted for nearly all of the region's imports, but in 1981 for only three quarters of its exports. Other export destinations have been Western Europe and Latin America.

The share of world trade accounted for by the North American intraregional flow dropped particularly during the early 1970s, this being the major component of its decreased import and export shares. At the same time, Northern Europe's exports to Western Europe represented an increased

share of world trade, but dropped in 1978, this being the major component of the former's export share fluctuations. In 1981 this trade flow represented 72% of Northern Europe's exports; its other main trading partners were the developing regions.

Western Europe, the second largest importer, took 69%, 21%, and 8% of its 1981 imports from Northern Europe, North America, and from within the region, respectively. These proportions have changed little over the period. Its overall share of the import market has steadily increased. Latin America is the third largest importer, with a share of around 7%.

13.2.9. Printing and writing paper

In 1981 trade in "other printing and writing paper" represented the fifth largest commodity group of forest products studied, with a value of $5.5 billion. Due to the increased international division of labor, particularly within Western Europe, a large and increasing proportion of this trade has been between developed regions (56% of world trade in 1962 compared with 75% in 1981), while developing regions' imports from the developed world have steadily decreased by half over the last 20 years (*Figure 13B.27*). The two major developed exporting regions have been Western Europe and Northern Europe (*Figure 13B.28*). The former's share increased by more than one third between 1962 and 1973 to a level of 50%, and after some fluctuation remained there. The picture for the latter's share is completely the reverse, first decreasing, then picking up in 1975 and 1977, but later dropping back to its low level of 29% in 1978. North America and Japan's shares of the export market have decreased slightly to 11% and 5%, respectively, and do not show the same large fluctuations in the mid-1970s. Trade between developing regions is very small (*Figure 13B.27*), the major (increasing) exporter being Latin America.

Western Europe has remained a net importer; its share of world imports has been fluctuating slightly but overall have been increasing, and in 1981 accounted for 60% (*Figure 13B.29*). Two thirds of this came from within the region and also accounted for 82% of Western European exports. Thus the fluctuations in its share of the export market noted above are mainly due to changes in intraregional trade. These shares are also indicative of the higher level of integration of countries within the EEC and an increasingly saturated market. It is noticeable that the years when the lowest proportion of Western Europe imports came from within the region are 1975 and 1977. Conversely, in 1975 and 1977 the proportion of Western European imports coming from Northern Europe was at its highest. This trade flow also accounted for over 60% of the latter's exports and is thus a major factor in the way its export share has changed. Northern Europe also exports to all the other regions studied, particularly to Eastern Europe and Latin America.

North American exports have increasingly been intraregional (66% of their exports in 1981 – this being mainly from Canada to the USA, with less going to Western Europe during the 1970s. Their trade with Latin America has

fluctuated but still represented 17% of North American exports of "other printing and writing paper" in 1981. It is interesting that up to 1974 their share of the import market decreased as well as that of the export market, but after 1974 the former almost doubled; thus they were net importers in 1978 and 1979. In these two years they had one third of their imports together from Western Europe and Northern Europe, a much higher proportion than in previous years.

The developing regions accounted for over 40% of world imports in 1962 with Latin America and "other Asian countries" each having a share of around 10%. By 1981 these regions, along with Africa, each had shares of around 5%. Other Asian countries imported mainly from Japan and Western and Northern Europe.

Looking at the pattern of bilateral flows in *Table 13.6* we can see that intraregional Western Europe trade has always been the most important flow, and has become much larger. At the same time, however, the concentration of flows has slightly increased; in 1981, eleven flows covered over 80% of world trade compared with fourteen in 1962.

Table 13.6. Shares of world trade of major bilateral flows of "other printing and writing paper" (%).

From	*To*	*1962*	*1966*	*1970*	*1974*	*1978*	*1981*
WEU	WEU	23.03	29.46	32.25	32.78	39.67	40.53
NEU	WEU	19.52	18.77	14.82	16.64	16.88	16.44
NAM	NAM	5.91	6.41	7.89	5.00	7.67	7.53
NEU	EEU	–	3.91	4.80	2.87	2.75	3.43
WEU	AFR	3.84	4.05	3.50	3.49	2.21	2.37
NAM	LAM	4.64	1.95	2.42	2.17	1.07	2.01
JAP	ASI	3.83	2.38	2.22	2.45	1.04	1.87
WEU	ASI	2.39	2.26	1.19	2.30	1.68	1.72
NEU	LAM	4.17	2.95	2.03	2.17	1.43	1.63

13.2.10. Other paper and board

Trade in "other paper and board" was the second highest of the product groups we have studied, with a value of $9.6 billion in 1981, 18.4% of world trade in forest products. As with printing and writing papers, a very high proportion of this (over 65% throughout the period) has been trade between developed regions (*Figure 13B.30*). In fact, two flows alone (intraregional Western European trade and Western European imports from Northern Europe) have always covered more than half of world trade. Developing regions' imports from developed regions have remained around 20% of world trade throughout, while trade between developing regions is negligible.

Northern Europe used to be the largest exporter of "other paper and board", but its share dropped steadily from 44% in 1962 to 32% in 1981, and in 1973 it was overtaken by Western Europe, whose share rose from 27% in 1962

to 37% in 1981 (*Figure 13B.31*). North America has remained the third largest exporter but with a decreasing share of the market between 1967 and 1979.

Western Europe has always accounted for over 57% of imports, although its share has been decreasing slightly. Four other regions – "other Asian countries", North America, Latin America, and Eastern Europe – have each had an import share of around 6% throughout the period. In other words, the world import share pattern has changed very little overall. However, the proportion of Western European imports coming from different regions has changed. Intraregional Western European trade has accounted for an increasing proportion of world trade (17% in 1962 compared with 27% in 1981), while Western European imports from Northern Europe and North America have been decreasing.

Intraregional trade accounted for three quarters of Western Europe's exports in 1981, the rest going mainly to Eastern Europe, Africa, Asia, and Northern Europe. The main reason for Northern Europe's decreased export share is its lower trade with Western Europe, since it also sends three quarters of its exports there. North America's share of the export market decreased, primarily due to lower trade with Western Europe; 44% of its exports went to Western Europe in 1962 compared with 27% in 1981.

Overall, trade in this commodity group is fairly concentrated, but has been less so during the last decade, with 13 flows accounting for over 80% of world trade in 1981 compared with nine in 1962.

13.3. Trade Intensity Analysis

Trade share structures can tell us much about the characteristic patterns of international trade, but they do not show us why these patterns are as they are, or why they are changing. Gravitational models can tell us what kind of exogenous variables play a role and how strong they are in the formation of trade flows, but this is based on the average effect of a great number of observations and cannot be used for explaining the bilateral pattern of trade.

Trade intensity analysis is designed to identify and quantify some of the factors influencing trade flow structures in their bilateral and commodity details. The concept of trade intensities is based on the assumption that trade flows depend on the "push" of the exporting country, the "pull" of the importing country and on particular factors regulating bilateral relations (see Froment and Zighera, 1964; Theil, 1967; ECE, 1973; and Nagy, 1979).

This classification of factors into two categories leads to a method which treats the "volume effects", i.e., the trade potential of the two countries, and the "intensity effects" separately. ("Volume effect", as the term is used here, has nothing to do with the usual notion of volume measured in physical units or in constant prices.) This is done by first computing a hypothetical "normal" flow, taking into account only the volume effects, and then comparing this with the actual flow data, thus obtaining the intensity effect as a residual. For the sake of simplicity, we shall introduce exporter's and importer's trade flow shares in the trade in a particular group of commodities:

$$Z_{ijk} = \frac{X_{ijk}}{X_{..k}}, \quad Z_{i.k} = \frac{X_{i.k}}{X_{..k}}, \quad Z_{.jk} = \frac{X_{.jk}}{X_{..k}}$$

and we can obtain a "normal" flow share (denoted by an overbar) by multiplying the exporter's share in total exports by the importer's share in total imports:

$$\bar{Z}_{ijk} = Z_{i.k} Z_{.jk}$$

The idea of "normal" trade flow in the above sense is an abstraction. Actual bilateral flows would be "normal" only if exporters distributed their exports according to the size of the import markets and importers bought goods according to the shares of the exporters in the overall trade in the given commodity.

The *intensity* of bilateral trade relations is taken to be the factor causing observed bilateral flows to deviate from "normal" behavior:

$$\delta_{ijk} = \frac{Z_{ijk}}{\bar{Z}_{ijk}} = \frac{Z_{ijk}}{Z_{i.k} Z_{.jk}}$$

The trade intensity coefficients reflect all factors affecting trade flows apart from the "volume effects", including distance, trade policy measures, discrimination, integration, historical links, etc. If these factors have little effect on bilateral trade the value of δ will be one (or thereabouts), while if they increase or reduce the trade flow, the coefficient will be greater or less than unity, respectively.

A trade flow of "normal" intensity is only a starting point of measuring, and no "normative" value judgments can be attached to it. Here a trade flow being "normal" means nothing more than that it is not influenced by trade policy, distance, and similar effects (or at least that the effects of this type offset one another), so that its share in the total of world trade is equal to the product of the exporting and the importing country's share in world trade.

The δ coefficients determine a structure of trade intensity that does not depend on the size of world trade, nor on the changes in the shares of the individual countries in world trade. The system of coefficients is cleared from the effects of enduring and cyclical changes, as well as from the volume effects. Consequently it may be justifiably considered as a characteristic expression of world trade structure and of bilateral trade relations.

The trade intensity coefficients are closely related to the above-mentioned share coefficients:

$$\delta_{ijk} = \frac{\alpha_{ijk}}{Z_{i.k}} = \frac{\beta_{ijk}}{Z_{.jk}}$$

Thus, the δ_{ijk} coefficient may be obtained either by dividing the import share with the share of the total exports of the exporting country in world trade or by dividing the export share with the share of the total imports of the importing country in world trade. The δ coefficient is directly proportional to the share coefficients and inversely proportional to the shares of total exports or imports.

The trade intensity index will be close to unity when the importing country accord the same treatment to all exporting countries, in the sense that they buy up the same percentage shares from the total supply of each country. In practice, the value of this index may be higher or less than unity because the importing regions prefer the products of certain exporting regions (with a view to geographical distance, competitive quality or price, and, last but not least, preferences accorded on political or integrational grounds); consequently they buy smaller shares from the supply of other regions. Thus the value of structural coefficients will be higher than unity in the case of the preferred exporting regions and less than unity for the rest.

One important feature of the trade intensity coefficient (δ) matrices is that their row and column totals weighted by the total export and import shares equal unity:

$$\delta_{ijk} Z_{.jk} = \frac{Z_{ijk}}{Z_{i.k}} \text{ , consequently : } \sum_j \delta_{ijk} Z_{.jk} = 1 \text{ and}$$

$$\delta_{ijk} Z_{i.k} = \frac{Z_{ijk}}{Z_{.jk}} \text{ , consequently : } \sum_i \delta_{ijk} Z_{i.k} = 1$$

This is only true when no zeros occur in the diagonal of the matrix as, for example, when we have regions instead of countries.

The importance of the above relations for the purposes of analysis is that if trade intensities are increasing in certain directions, others have to decrease, as their weighted average has to remain one. Weights and intensities can, of course, move together, strengthening this effect, but this is not necessarily so. Therefore we have to look carefully both to the changing structure of the shares and to those of trade intensities expressing changes in trade policy relationships. (Note that trade intensities express both the effects of distances and of trade policies; but as distances usually do not change and transportation costs change slowly, intensity changes mainly reflect trade policies.)

The results of previous studies on trade intensities (see Savage and Deutsch, 1960; Goodman, 1963; Alker and Puchala, 1968; and Nagy and Török, 1971) showed that these coefficients usually undergo certain distinct types of change, such as:

(1) "Normalization" of international trade relations, meaning liberalization of trade, which reduces the deviation of real from so-called "normal" flows;

this is reflected in δ coefficients by a closer approach to unity from either above or below.

(2) Integration of certain groups of countries, increasing the intensity coefficients for intraregional trade to values above unity and decreasing those for extraregional trade to values below unity.

(3) "Flattening out" of the trend, meaning that the rate of change diminishes as the intensity coefficient approaches a certain level [unity, in case (1)], or a higher or lower level [in case (2)].

(4) In a situation in which the direction of movement of the intensity coefficient is opposite to the trends described in (1) and (2), the trends usually revert to (1) or (2) over time.

These types of changes have been found in very highly aggregated trade flows, as in the case of total bilateral trade or in commodity groups such as machinery, food, and agricultural products. To our knowledge, no studies of trade intensities have been previously carried out with such a detailed commodity breakdown as is presented in the following. It can be expected that the less commodity (or regional) aggregation is applied, the more varieties and divergencies will be found in the behavior of individual trade intensity coefficients.

13.3.1. Trade intensities of forest products

Trade intensities of the individual flows can be studied by commodity groups, when the effects of distance and trade policy can be studied on the bilateral transactions of the same commodity; or by exporting and importing regions, when the question can be asked how these factors influence the trade of different commodities of the same region. In the following we shall proceed by commodities. In the analysis of each commodity we initially outline the major exporters and importers and mention important bilateral flows. A detailed description of these and their changes over the past 20 years can be found in Section 13.2.

Trade intensities are usually high within the regions (the diagonal elements of *Table 13.7*), partly for reasons of closeness, and transportation costs, partly because several of the regions are integrated country groupings. High intensities can be found in the trade of the three European regions and in the Japanese exports and imports with the ASEAN countries and Oceania. Latin American export intensities are relatively high with Africa and Northern Europe, North American exports to Latin America, and in the trade of the two Asian regions.

Trade in forest products is strongly concentrated: out of 99 bilateral flows only 15 are above 1%, and trade intensities in the case of 65 flows are below unity, the so-called "normal" level.

Figures 13B.32–13B.35 show the time series of major trade intensities for all products. It can be seen that both Western European import and North American export intensities do not fluctuate much over time; mostly they

Table 13.7. Trade intensity indicator for all forest products in 1981.

	1 NAM	*2 JAP*	*3 NEU*	*4 WEU*	*5 EEU*	*6 OCE*	*7 AFR*	*8 LAM*	*9 ASE*	*10 ASI*
1 NAM	2.48	1.57	0.14	0.47	0.09	0.95	0.56	1.84	0.55	0.80
2 JAP	0.63		.00	0.36	0.29	0.09	4.67	0.58	0.33	5.60
3 NEU	0.08	0.07	2.14	1.42	2.28	0.71	1.38	0.51	0.70	0.93
4 WEU	0.07	0.04	1.20	1.66	1.15	0.48	1.23	0.30	0.36	0.49
5 EEU	0.03	1.65	2.65	1.07	3.35	0.01	2.37	0.01	0.12	0.81
6 OCE	0.06	3.39	0.03	0.09	0.00	19.23	0.26	0.02	4.41	1.78
7 AFR	0.23	0.33	0.41	1.70	0.87	0.16	0.80	0.41	0.07	0.17
8 LAM	0.98	0.71	1.34	0.73	0.00	0.26	1.73	5.89	0.37	0.99
9 ASE	0.37	3.79	0.15	0.56	0.01	1.20	0.25	0.01	5.68	2.02
10 ASI	1.44	1.05	0.61	0.29	0.08	0.21	0.47	0.05	4.37	5.59

remain constant or follow a time trend. This is also true for North European exports (*Figure 13B.34*), with the exception of intraregional trade and exports to Eastern Europe, both of which, even if fluctuating a lot, remain highly intensive. The Japanese import intensity from the USSR remains constant, and imports from the ASEAN countries is decreasing in intensity even if it remains high (*Figure 13B.35*).

In studying the trade intensities of individual commodities (some of which are broad product categories themselves), one should keep in mind that since we have 10 regions and 11 commodity groups, we have 1100 trade intensity coefficients for each year; consequently there are 22000 for the whole period of observation. Naturally, we cannot go into great detail but will try to concentrate on the more important products and trade links.

13.3.2. Coniferous logs

Trade in coniferous logs is a relatively minor part of total trade in forest products, and one has to keep in mind that 75% of all imports goes to Japan, mainly from North America, the USSR, and the ASEAN countries. The intensities of these major flows are relatively stable over time and they are usually somewhat above unity (see *Figure 13B.36*). Export intensities from North America and the ASEAN countries to Japan show certain complementary cyclical movements: when one is lower, the other is higher, and vice versa.

Intraregional trade in Northern and Western Europe and North America is extremely high (*Figures 13B.36* and *13B.37*), and even if there are fluctuations, they do not show a declining tendency. In 1981, 97% of all coniferous log exports of Western Europe were traded within the region, and 49% of North European exports among themselves, while only 3.6% of all North American exports were traded between the United States and Canada, as 86% went to Japan. Eastern European export intensities to Western Europe showed much fluctuation, and a significant increase has been observed since the mid-1970s.

13.3.3. Nonconiferous logs

The share of nonconiferous logs in total world trade of forest products was similar to that of coniferous Logs in 1981. Two regions accounted for 68% of exports and 86% of all imports; they were Africa and the ASEAN countries on the one hand, and Japan and Western Europe on the other.

Trade intensities of these flows were high (in the neighborhood of two), and they stayed fairly constant over time (*Figure 13B.38*). The ASEAN export intensity to Japan decreased significantly during the 1960s with a parallel increase in the intraregional trade intensity of the ASEAN countries. Trade intensities were high (above ten) in certain regions' intraregional trade – for example, North America, Northern Europe, Oceania, and the ASEAN countries.

13.3.4. Coniferous sawnwood

Both North American export and West European import intensities show regular trends (see *Figures 13B.39 and 13B.40*). United States–Canadian trade and their exports to Japan and Oceania are highly intensive and slowly diminishing over time. The Northern European export intensity to Western Europe is stable throughout the whole period, while its export intensities to Africa and "other Asian countries" increased substantially in the mid-1970s, reaching a similar level of 1.5 (*Figure 13B.41*). East European exports are directed mainly to Western Europe (since East European intraregional trade is not represented correctly in our data base), where the export intensity is as high as that of West European intraregional trade.

Transportation costs and climatical constraints on endowment are obviously playing a major role in determining trade relationships in the case of coniferous sawnwood, and these relationships seem to be quite stable over time. Trade policy factors nevertheless have a great influence on certain trade flows; one cannot explain, for example, by the factors above why Soviet export intensity to Japan is so low (0.16 in 1981), while in the case of coniferous logs it is regularly in the neighborhood of the "normal" level, as we have seen in *Figure 13B.36*.

13.3.5. Nonconiferous sawnwood

Figures 13B.42 and *13B.43* show how the trade intensities of the major exporter (the ASEAN countries) and the major importer (Western Europe) developed in the period under observation. As can be seen, West European import intensities have a rather smooth trend. In the case of the trade of the ASEAN countries among themselves, a rapid change in intensity came in the late 1960s, when it jumped from a very low level to a relatively high one and

became stabilized. The ASEAN countries also have a high export intensity with Oceania and Japan and one on the "normal" level with their major import market, Western Europe.

Western European import intensity is stable and relatively high from Africa, on the same level as their intraregional trade. An opposite movement can be observed in the Western European import intensities from Eastern Europe and from North America. Since the early 1970s, the first has decreased, the second has increased, and both reached a near-"normal" level of trade intensity by the end of the decade.

It is interesting to compare the high level of North American import intensity from Latin America with the much lower one of their imports from the ASEAN countries. This can be compared with the Western European import intensities from the same regions and Africa. It seems to be obvious that in these highly divergent trade intensities trade policy factors, such as the remnants of colonial links, play a significant and slowly changing role.

13.3.6. Panels

Figures 13B.44 and *13B.45* show the West European import and export intensities with its major trading partners. African exports show a high and slightly increasing intensity, while import intensities from North and East Europe are slowly decreasing and approaching the "normal" level. Import intensities from America (both North and South) to the West European market were significantly below one in the 1960s; they increased to the "normal" level by the early 1970s, but Latin American imports fell back after that.

West European intraregional trade in panels is intensive and stable. Export intensities to Eastern Europe increased to a very high level in the late 1960s/early 1970s, decreased since, but remained relatively high. Exports to Africa and Asia showed a slowly declining intensity, the former being much higher than the latter.

The closeness of producers and customers seems to be an important factor in panel trade, which explains why intraregional trade intensities of such regions as North America, North Europe, Latin America, the ASEAN countries, or the trade intensity between the two Asian regions is high.

North American import intensities are presented in *Figure 13B.46*, showing that intensities from Japan, the ASEAN region, and the "other Asian countries" are very high, while the intensities of Latin American and ASEAN imports changed places, the first increasing, the second decreasing in the 1970s. But all of the above regions had trade intensities with North America above the "normal" level, and as a consequence there were extremely low intensities in panel imports from the European regions, and from Oceania and Africa.

13.3.7. Pulp

The two major exporters' intensities are presented in *Figures 13B.47* and *13B.48*. North American export intensities show quite regular trends and the tendency of "normalization": coefficients approaching one from above and from below can be observed. Export intensities to Japan decreased and those to Africa increased significantly. The intensity of exports to Latin America and from Canada to the United States remained high.

The Scandinavian countries had highly intensive exports of pulp to the two other European regions; to Western Europe it remained stable while to Eastern Europe it showed an increasing tendency. Their intraregional trade is very intensive and seems to fluctuate cyclically.

Western European import intensities can be seen in *Figure 13B.49*, showing that intraregional trade remained intensive and stable throughout the period while the other four major exporters to this market slowly "normalized" their trade intensities. East European and African export intensities moved slowly downward while North and South American intensities moved upward.

13.3.8. Newsprint

Figure 13B.50 shows North American export intensities with its major trading partners (with the exception of Japan, to be discussed later). Canadian exporting to the United States is highly intensive and slowly increasing. Export intensity to Western Europe is low and slowly decreasing. Consequently, no "normalization" of trade can be observed on these two major markets for Canadian exports. On the other hand, exports to the two major developing regions, Latin America and Asia, become more intensive. All four major export directions have a very stable intensity trend with relatively little fluctuation.

Export intensities of the Scandinavian countries are presented in *Figure 13B.51*. This shows a general trend of "normalization", which means in the case of exports to Western Europe that the intensity indices are slowly decreasing from about three toward two. Export intensities to the East European markets fluctuate a lot, probably because of the irregularities and shortages of internal production and intraregional trade, but they also show a declining tendency of between three to four toward between two to three. North European exports to their major developing markets such as Latin America and the two Asian regions moved toward and approximately reached the "normal" level.

The results of competition between North America and North Europe in the Japanese newsprint market are shown in *Figure 13B.52*. The latter

started to export newsprint to Japan in 1972 and increased its export intensity from zero to 3.6 in five years. As a consequence the North American export intensity had to decrease from 1.3 to 0.3. In 1977 a sudden turn came in both trade relations. The North European export intensity sank below the "normal" level, while the North American intensity increased to its former state.

Intraregional trade of newsprint is very intensive even in the case of some developing regions; the coefficient was, for example, 24 in the case of Oceania in 1981, 23 for the ASEAN countries, and 14 for Latin America.

13.3.9. Printing and writing paper

Figure 13B.53 presents the export intensities of the North European countries. The general tendency is "normalization" of trade relations; with all major markets except the East European countries, the divergencies of the intensity coefficients are diminishing in time. Their interval was 0.2–1.4 in the early 1960s and it became 0.7–1.2 in the late 1970s, with North America, "other Asian countries" and Africa being below the "normal" level and Latin America and Oceania above it. Distance alone certainly cannot explain all these differences; there are obviously trade policy factors at work. Export intensities from North to East European countries are remarkably high, and they increased in the 1970s.

Western European import intensities show a high intraregional trade intensity and a decreasing intensity of North European exports reaching a below-"normal" level by the early 1980s. Import intensities from Eastern Europe decreased considerably, while those from Japan increased to about the same level. This showed that trade policy factors and probably problems with quality were stronger than the effect of distance in the choice of suppliers in this case for the West European countries.

Figure 13B.54 shows a few of the highly intensive trade flows: United States–Canadian trade intensity was extremely high throughout the period (around six) and showed no sign of decline. It is no surprise, then, that all the other importers' intensities were very low in the North American market (with the exception of North Europe). North American exports to Latin America were also quite high and increased in the 1970s at the expense of the Nordic countries (compare with *Figure 13B.53*). Japanese exports to (non-ASEAN) Asia were very intensive but started to fluctuate strongly in the early 1970s, when Latin America started to compete on the Asian market. It is remarkable that since that time, the export intensities of these countries on the Asian market showed a mirror image: when one increased, the other decreased, and vice versa.

Many of these high intensities (and as a consequence the low trade intensities in the other cases) cannot simply be explained by distance factors. There are obviously many trade policy factors at work, hindering, for example, European exports to North America, supporting North American exports to Latin America and keeping others out.

13.3.10. Other paper and board

North and West European export intensities can be found in *Figure 13B.55* and West European import intensities of their major suppliers in *Figure 13B.56*. The intraregional trade of both regions increased steadily throughout the period, but did not reach a high level of intensity (1.7 and 1.3). Their trade with each other showed a stable relationship in one direction: the trade intensity from North to West Europe hardly fluctuated at all around the level of 1.2, while the opposite direction of trade decreased in intensity from 1.8 to 1.1.

The North European export intensity to Eastern Europe was one of the highest in European trade relations, while East European exports to Western Europe increased in intensity very substantially, beginning the late 1960s.

The trade intensity between North America and Western Europe decreased strongly in both directions (0.46 and 0.37 in 1981), with the value of the trade flows being between one half and one third of what would be the "normal" level. Looking at *Figures 13B.55* and *13B.56* one can observe that practically all major trade flows illustrated there have a clear tendency, and the fluctuations over time are not usually large. Changes in the direction of the trade policy factors can hardly be observed.

Both Japan and Oceania have highly intensive exports to the Asian regions, as can be seen in *Figure 13B.57*. However, even if these flows are very intensive and fluctuate rapidly, at least three out of the four major flows show a certain tendency of "normalization", but this does not mean more than that the intensity coefficients are decreasing from 10–11 to 5–8.

The intraregional trade intensities of Oceania, Latin America, and the Asian regions are very intensive (usually above ten) and they are quite stable, showing that the closeness of producers and customers also play an important role in the trade of this product category.

13.4. The Role of Trade Intensities in the Changing Pattern of Trade Shares

Up to now we have studied trade intensities in a comparative static sense, i.e., how trade intensities of the major flows have changed over time. However, we have not asked how these trade intensity changes influenced the pattern of trade shares. To put it another way; what was the weight of trade policy changes in shaping the major bilateral trade flows?

From the definition of the trade intensity coefficients (Section 13.3), it follows that the share of bilateral flows in the world trade of a given commodity can be defined in the following way:

$$Z_{ijk} = \delta_{ijk} Z_{i.k} Z_{.jk}$$

This is equally true for the indices of trade share changes and trade intensity changes (denoted by $\tilde{Z}_{ijk}$). If, for example, we divide our period of observation into two parts, the first from 1962–1970 and the second from 1970–1981, we get two types of time indices:

$$\tilde{Z}^1_{ijk} = \frac{Z^{70}_{ijk}}{Z^{62}_{ijk}} \quad , \quad \tilde{\delta}^1_{ijk} = \frac{\delta^{70}_{ijk}}{\delta^{62}_{ijk}}$$

$$\tilde{Z}^2_{ijk} = \frac{Z^{81}_{ijk}}{Z^{70}_{ijk}} \quad , \quad \tilde{\delta}^2_{ijk} = \frac{\delta^{81}_{ijk}}{\delta^{70}_{ijk}}$$

Applying this to the equation above, we can see what the weight of trade policies was in shaping the changes in the share of the Z_{ijk}, and also the role of the changing exporters' and importers' shares in shaping the changes in the individual trade flows.

We are unable here to analyze the role of the factors mentioned above for each commodity, but *Tables 13.8* and *13.9* show this for the major flows of all wood products included in our study for the two periods mentioned above. The factors influencing the changing trade patterns can be read from the tables in the following way. The share of North American exports to Japan (shown by the upper figure in the second cell of the first line of *Table 13.8*) increased by 181% between 1963 and 1970, even though the share of total American exports fell by 3%. This was because total Japanese imports increased by 117%, and the trade policy attraction increased by 33%. In the next period of 1971–1982 (*Table 13.9*), the share of world trade represented by this flow fell by 10%, because both the American export share and the Japanese import share decreased in total world trade (by 2% and 19%) and the 13% increase in the trade intensities was not enough to counterbalance it. The change in the time index of the trade flow is equal to the multiplication of the three factors mentioned in the equation above. (This equality is not exact in our tabular data because of rounding errors.)

North American export shares increased significantly in the first period on their major markets, even if their total export share fell back somewhat. This was due to the increase of trade intensities and in some cases to increasing shares of their importers. On the other hand, the share of United States–Canadian trade decreased by 32% without any trade policy change. In the 1970s North American export shares decreased in all of their major developed markets, but they were able to increase them in Asia and Latin America. The role of the different factors can be read from the first two lines of *Table 13.9*.

The export performance of the Northern European countries in their three major markets can be seen from the third line of the tables. In the first period the share of their intraregional trade and their exports to the Eastern European countries increased strongly. In the first case this was because

Table 13.8. Factors of change in the share of trade flows of all wood products between 1963 and 1970 (%).[a]

	NAM	*JAP*	*NEU*	*WEU*	*EEU*	*OCE*	*AFR*	*LAM*	*ASE*	*ASI*	*TWO*
NAM	68	281		119				122			97
	103	133		128				113			
NEU			146	82	179						85
			117	102	84						
WEU			138	119	467		121	133		109	122
			78	103	155		70	100		73	
EEU		248		74			390			243	103
		111		76			257			187	
ASE		175							600	293	201
		40							196	119	
ASI									44	70	74
									40	76	
TWO	68	217	146	95	250		143	112	149	124	

[a] The upper number in each cell shows $\tilde{Z}^1_{ijk}$ share changes, the lower number the $\tilde{\delta}^1_{ijk}$ coefficient changes in percentages. In the last column, the $\tilde{Z}^1_{i.k}$ total export share changes and in the last row, $\tilde{Z}^1_{ijk}$, the total import share changes can be found in percentages.

Table 13.9. Factors of change in the share of trade flows of all wood products between 1971 and 1981 (%).[a]

	NAM	*JAP*	*NEU*	*WEU*	*EEU*	*OCE*	*AFR*	*LAM*	*ASE*	*ASI*	*TWO*
NAM	99	90		90				108	116	216	98
	105	113		94				126	73	136	
NEU			98	83	114						92
			97	91	122						
WEU	169		120	143	79		97	69		191	134
	117		82	107	58		62	58		86	
EEU		59		64			110			52	73
		99		88			128			43	
AFR				67							70
				97							
LAM	147	1800	450	172				59			133
	114	1183	344	130				50			
ASE		65							250	90	98
		82							158	56	
ASI									162	179	92
									114	119	
TWO	96	81	111	99	102		116	87	162	163	

[a] For explanation, see note to *Table 13.8.*

both their import share and their intraregional trading conditions had a positive effect; in the second case the import "pull" factor increased very strongly, while the trade policy factors played a negative role. In the 1970s their export shares diminished both in Northern and Western Europe; they were able to increase them only with the Eastern European countries, and

only because the trade policy conditions improved. The share of total exports of the Northern European countries in world trade decreased in both periods, by 15% in the 1960s and 8% in the 1970s.

Western European countries increased their export shares in both periods quite strongly (by 22% in the first and 34% in the second period) while their import share decreased. The development of integration contributed to the increase of their intraregional trade share, which was 19% in the 1960s and 43% in the 1970s. Their export share to the Eastern European countries increased very strongly (by 367%) in the first period, because all three factors played a very positive role, but then in the 1970s it fell back by 21%, only because the trade policy changes were strongly negative. The great difference in the changing political climate between the Northern and West European countries *vis-à-vis* the Eastern European countries is very noticeable in *Table 13.9*. Between 1970 and 1981 the trade intensity increased by 22% in the first case and decreased by 42% in the second.

The Japanese import share rose very fast in the 1960s, which, coupled with growing trade intensities with North America and the Soviet Union, increased their share very significantly. In the 1970s the Japanese import share decreased by 19%, and only Latin America could increase their export shares very substantially, mainly because of improving trade policy conditions.

The ASEAN countries significantly increased both their export and import share in the 1960s; later they practically kept their export share and increased their imports even faster. Their trade intensities increased strongly in their intraregional trade in both periods, resulting in a very fast growth of the share in intraregional trade.

We cannot go into every detail, but the examples above can give an idea how this tool can be used for analytical purposes. The explanatory power of the factors of change can be even more powerful in the case of individual and more homogeneous commodities.

13.5. Conclusions

Trade intensity analysis has shown us that trade policy factors play a significant part in shaping trade patterns and in choosing export and import markets. Also changes in trade policies usually have significant effects on trade patterns of forest products.

The case of the 11 commodity groups above show a very divergent picture in this respect; consequently it is difficult to arrive at conclusions generally valid for all commodity classes. Nevertheless some characteristics of the trade intensities can be observed on the trading pattern of the forest products:

(1) We found a great number of cases where trade intensities were stable, i.e., they showed little fluctuation through time, either in the sense that

they hardly changed or that a smooth change followed a particular trend. This is an important observation for forecasting purposes, because it can be assumed that these intensities will continue to be stable in the future; or if we assume trade policy changes in the future, the inertia of these flows will be strong and their change will be slow and relatively smooth.

(2) "Normalization" of trade intensities has been observed in a significant number of cases. This is the result of trade liberalization, breaking down or diminishing the effect of previous colonial links or preferential ties on the one hand, and opening up trade relations where political and other artificial barriers hindered trade on the other.

(3) Both distance and political and economic alliances created preferential trade relationships with a high intensity, in parallel diminishing or keeping at a low level the intensities of other trade flows. These preferential and nonpreferential relationships seem to be quite stable or even increasing in many cases, opposing the forces working for "normalization" of the trade intensities.

(4) In a relatively smaller number of cases sudden changes of trade intensities were observed, showing that political factors can play a significant role influencing trade patterns in certain cases. This happened mainly in East–West and North–South trade relations, where political factors obviously have a more pronounced influence on trade.

(5) Trade in forest products is usually strongly concentrated in our regional aggregation: as a consequence trade intensity analysis can be concentrated on a relatively small number of trade flows. This can be very helpful if the use of trade intensity information is intended for projecting or estimating future trade patterns.

(6) In cases where trade policies or purely political considerations have an obvious influence on trade relationships, the assumption that they diminish in time cannot be generalized. It seems to be doubtful that in such cases the inertia approach can be applied, because it is based on the assumption that nonprice, noncompetitive factors have a decreasing influence on the trade flows. In a certain number of cases this is true: this was observed in our case by the tendency of "normalization" of trade intensities. However, in other cases the opposite has been observed, either by the formation of new or stronger integrations (and consequently disintegrations), or by sudden trade policy changes that went in both positive and negative directions. This leads us to think that in modeling the future of trade in forest products it will be necessary to go into some detail in specifying how trade policies will be changed, and no generally applicable recipe can be found in forecasting the factors shaping trade patterns if we wish to preserve the realism and relevance of the results.

Appendix 13A. Regions and Commodities

13A.1. Detailed regions

(1) NAM: North America
(2) JAP: Japan
(3) NEU: Northern Europe (Finland, Norway, and Sweden)
(4) WEU: Western Europe
(5) EEU: Eastern Europe (including the USSR and Yugoslavia)
(6) OCE: Oceania
(7) AFR: Africa
(8) LAM: Latin America
(9) ASE: ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand)
(10) ASI: Other Asian countries

13A.2. Summary regions

(1) TDD: total developed regions
(2) TSC: total socialist regions
(3) TDG: total developing regions
(4) TWO: total world

13A.3. Product classification

Products	*4 digit SITC REV1*	*Description*
(1) Coniferous logs	242.2	Sawlogs + veneer logs
(2) Nonconiferous logs	242.3	Sawlogs + veneer logs (NC)
	242.4	Pitprops (C + NC)
	242.9	Other industrial roundwood (C + NC)
(3) Pulpwood	242.1	Pulpwood (C + NC)
(4) Fuelwood	241.1	Fuelwood + wood residues
	241.2	Wood charcoal
(5) Coniferous sawnwood	243.2	
(6) Nonconiferous sawnwood	243.3	
	243.1	Sleepers
(7) Panels	631.1	Veneer sheets
	631.2	Plywood
	631.42	Particleboard
	641.6	Fiberboards + other build board
(8) Pulp	251.2	Mechanical
	251.9	Semi-chemical
	251.7	Sulfate
	251.8	Sulfite
	251.6	Dissolving grades
	251.5	Other wood pulp
(9) Newsprint	641.1	
(10) Printing and writing papers	641.2	
(11) Other paper and board	641.3	Kraft paper and paperboard
	641.4	Cigarette paper
	641.5	Machine-made paper
	641.7	Hand-made paper
	641.9	Rolls/sheets

Appendix 13B. Graphs of Trade Shares and Intensities

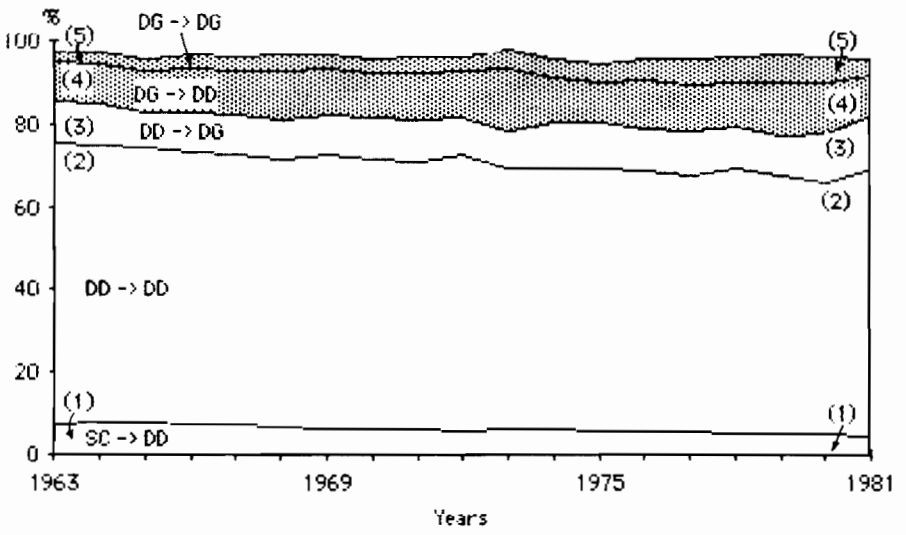

Figure 13B.1. Cumulative share of world trade of flows among socialist, developed, and developing regions: (1) TSC/TDD; (2) TDD/TDD; (3) TDD/TDG; (4) TDG/TDD; (5) TDG/TDG.

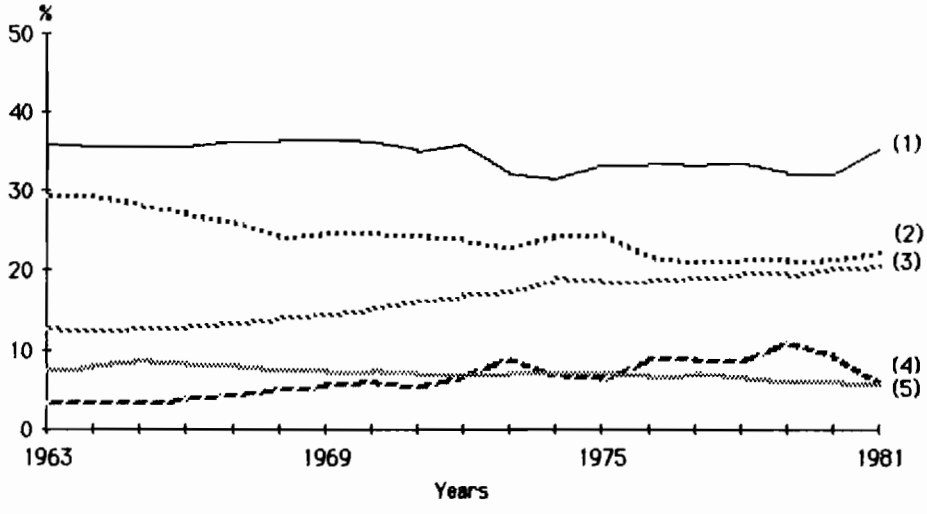

Figure 13B.2. Share of world trade of major exporters of all forest products: (1) NAM/TWO; (2) NEU/TWO; (3) WEU/TWO; (4) ASE/TWO; (5) EEU/TWO.

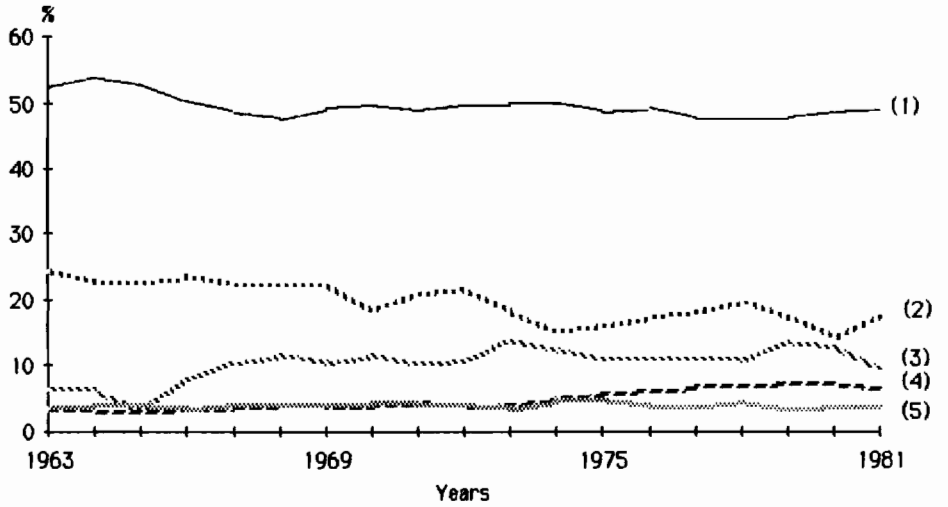

Figure 13B.3. Share of world trade of major importers of all forest products: (1) TWO/WEU; (2) TWO/NAM; (3) TWO/JAP; (4) TWO/ASI; (5) TWO/LAM.

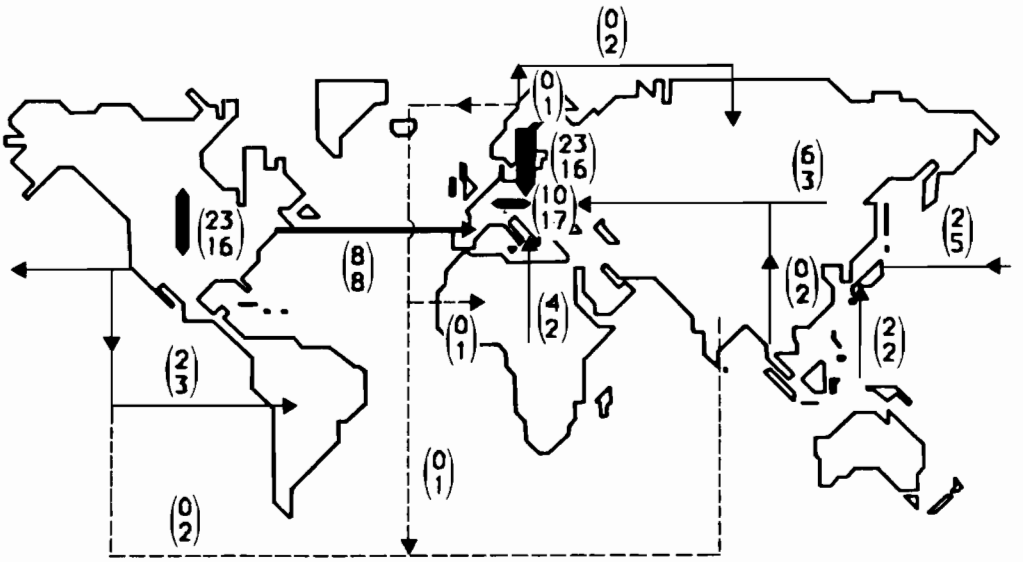

Figure 13B.4. All forest products: bilateral trade flows ≥ 1% of world trade in 1981; $\binom{1962}{1981}$ shares given; – – → flow ≥ 1% only since the late 1970s.

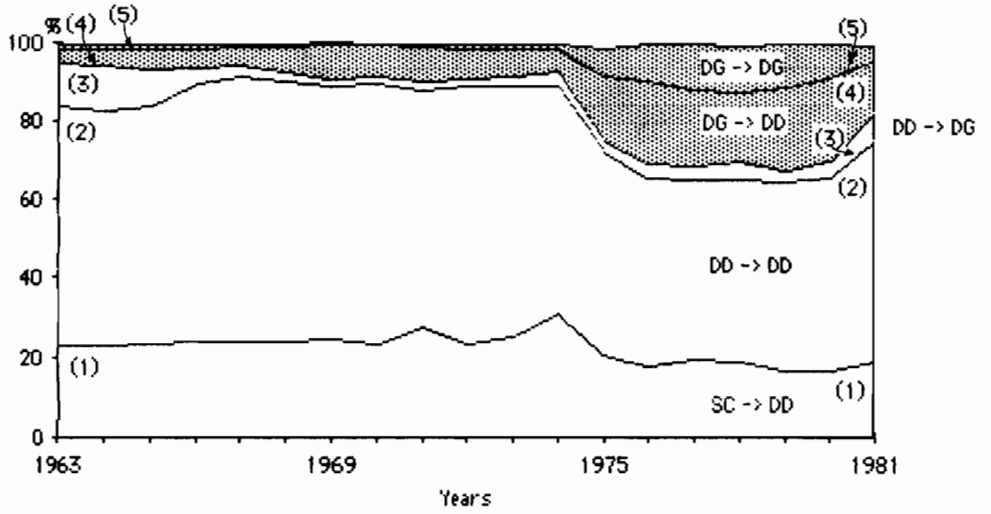

Figure 13B.5. Cumulative share of world trade in coniferous logs between developed, socialist, and developing regions: (1) TSC/TDD; (2) TDD/TDD; (3) TDD/TDG; (4) TDG/TDD; (5) TDG/TDG.

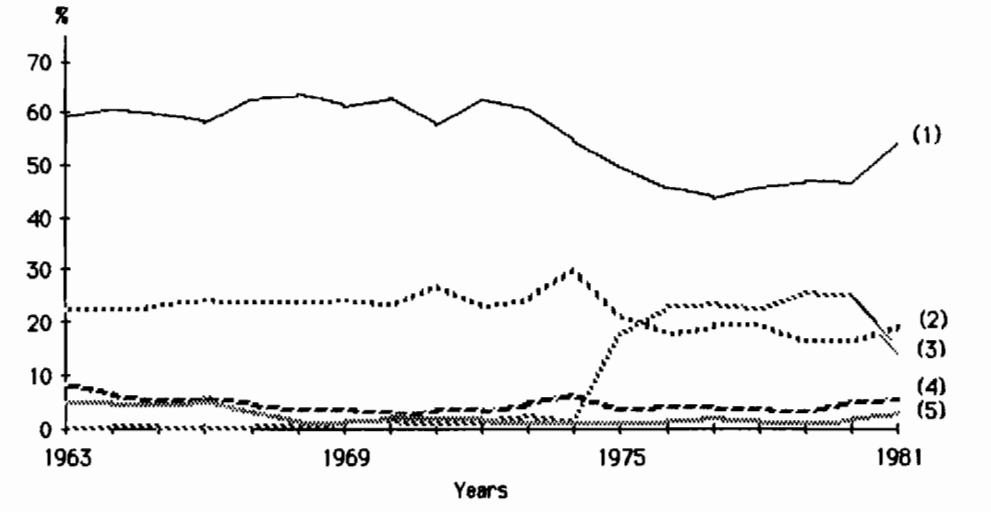

Figure 13B.6. Shares of world trade of major exporters of coniferous logs: (1) NAM/TWO; (2) EEU/TWO; (3) ASE/TWO; (4) WEU/TWO; (5) NEU/TWO.

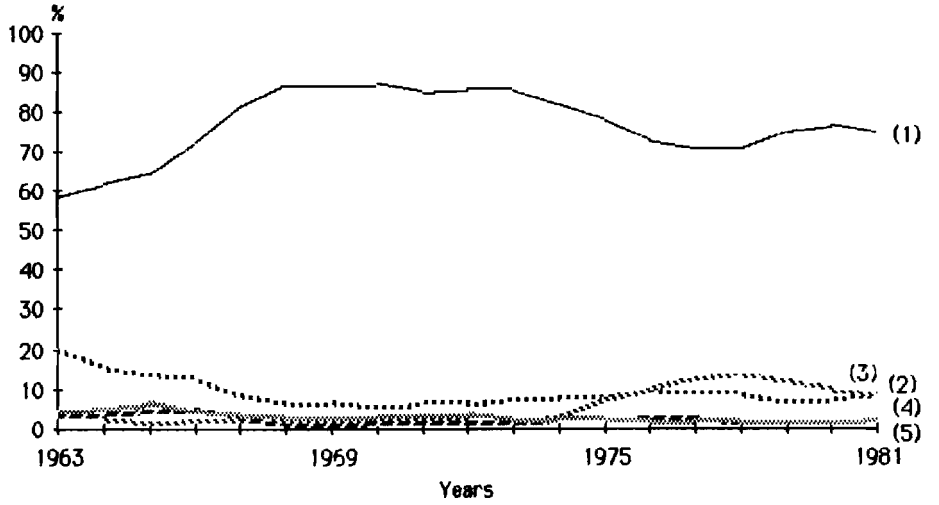

Figure 13B.7. Shares of world trade of major importers of coniferous logs: (1) TWO/JAP; (2) TWO/WEU; (3) TWO/ASI; (4) TWO/NEU; (5) TWO/NAM.

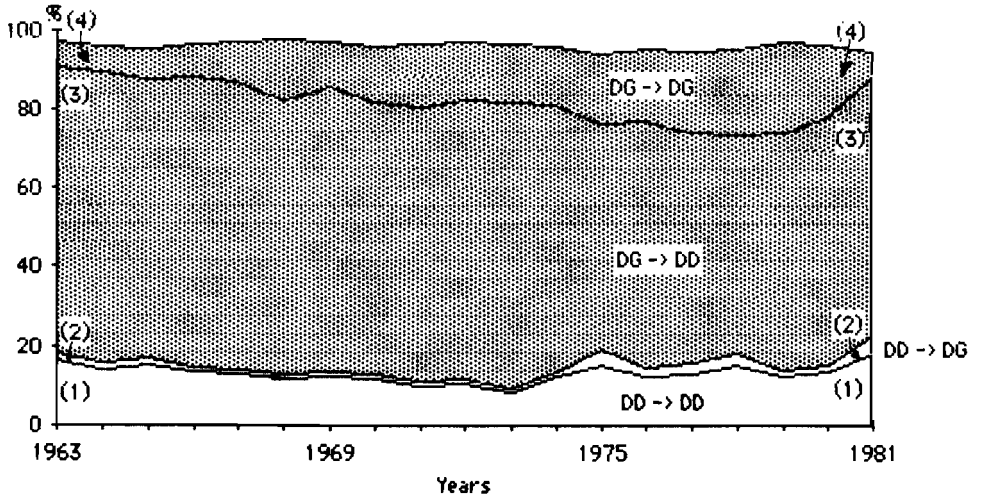

Figure 13B.8. Cumulative share of world trade in nonconiferous logs between developing and developed regions: (1) TDD/TDD; (2) TDD/TDG; (3) TDG/TDD; (4) TDG/TDG.

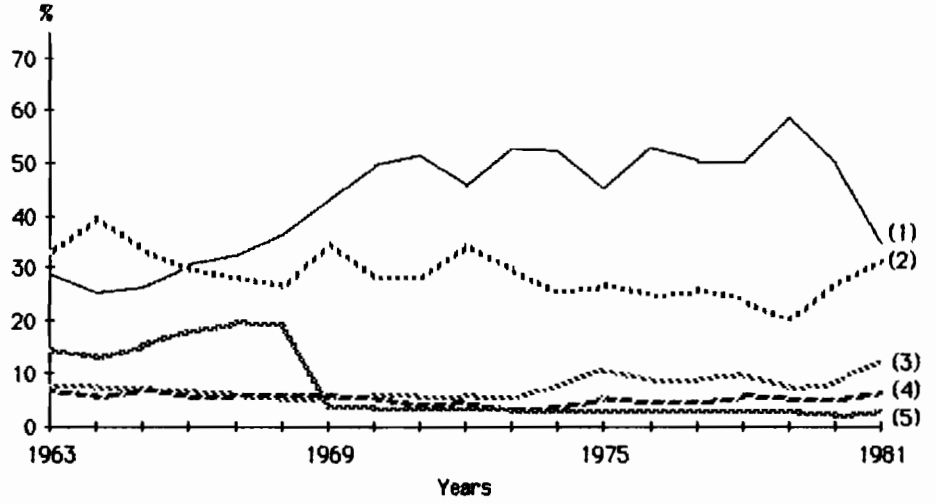

Figure 13B.9. Shares of world trade of major exporters of nonconiferous logs: (1) ASE/TWO; (2) AFR/TWO; (3) WEU/TWO; (4) NAM/TWO; (5) ASI/TWO.

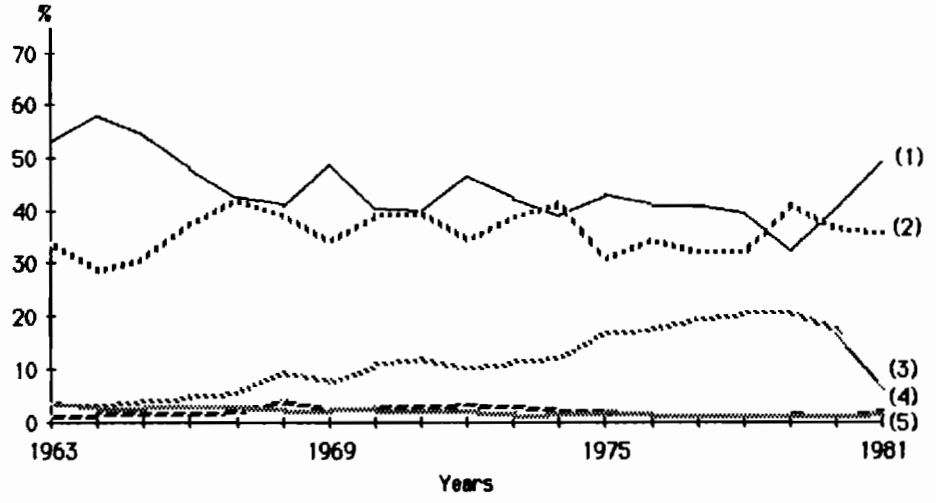

Figure 13B.10. Shares of world trade of major importers of nonconiferous logs: (1) TWO/WEU; (2) TWO/JAP; (3) TWO/ASI; (4) TWO/ASE; (5) TWO/NAM.

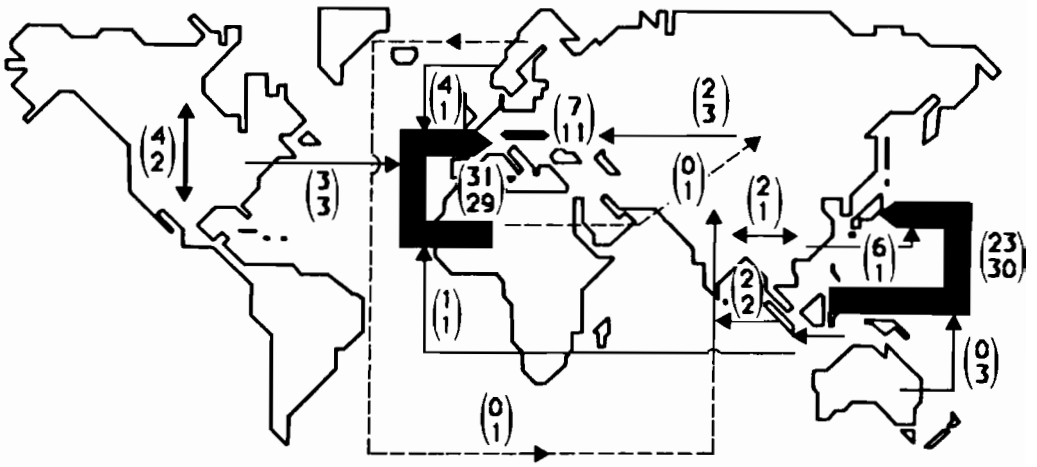

Figure 13B.11. Nonconiferous logs: bilateral trade flows ≥ 1% of world trade in 1981; $\binom{1962}{1981}$ shares given; – – → flow ≥ 1% only since the late 1970s.

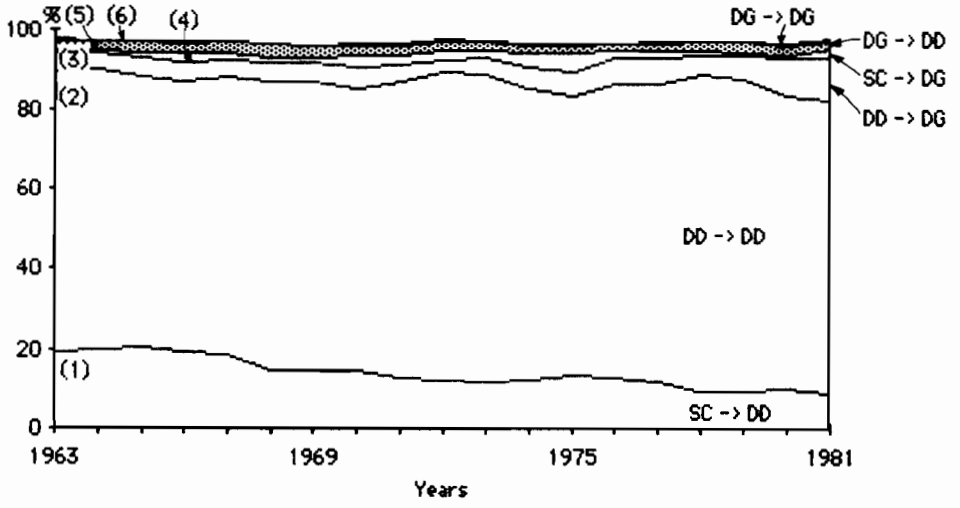

Figure 13B.12. Cumulative shares of world trade of flows between socialist, developed, and developing regions for coniferous sawnwood: (1) TSC/TDD; (2) TDD/TDD; (3) TDD/TDG; (4) TSC/TDG; (5) TDG/TDD; (6) TDG/TDG.

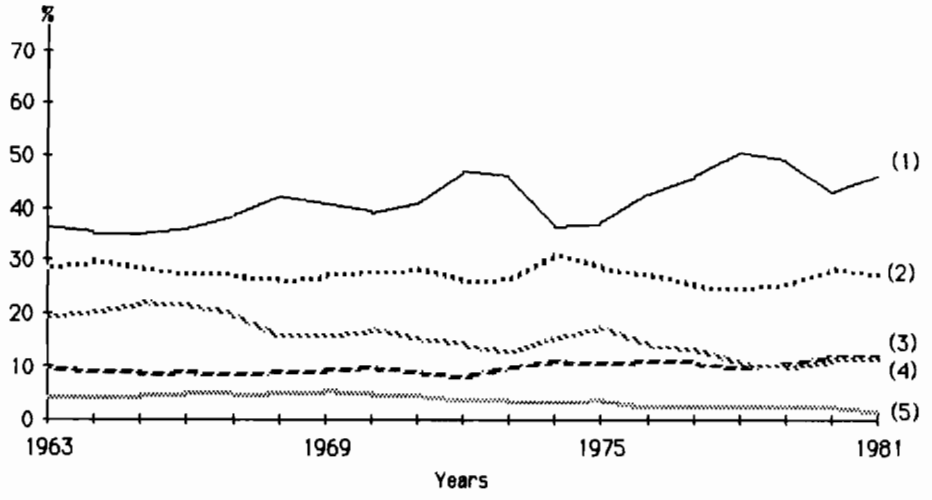

Figure 13B.13. Shares of world trade of major exporters of coniferous sawnwood: (1) NAM/TWO; (2) NEU/TWO; (3) WEU/TWO; (4) EEU/TWO; (5) LAM/TWO.

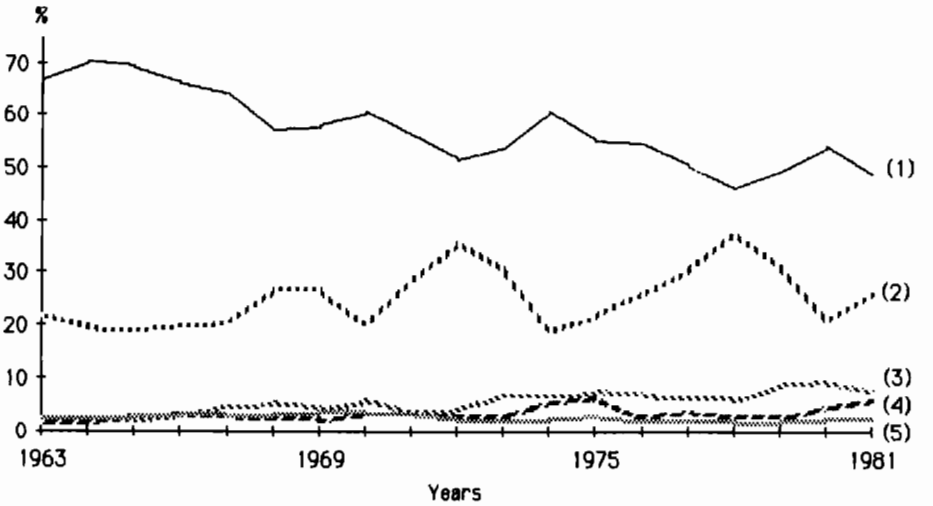

Figure 13B.14. Shares of world trade of major importers of coniferous sawnwood: (1) TWO/WEU; (2) TWO/NAM; (3) TWO/JAP; (4) TWO/AFR; (5) TWO/LAM.

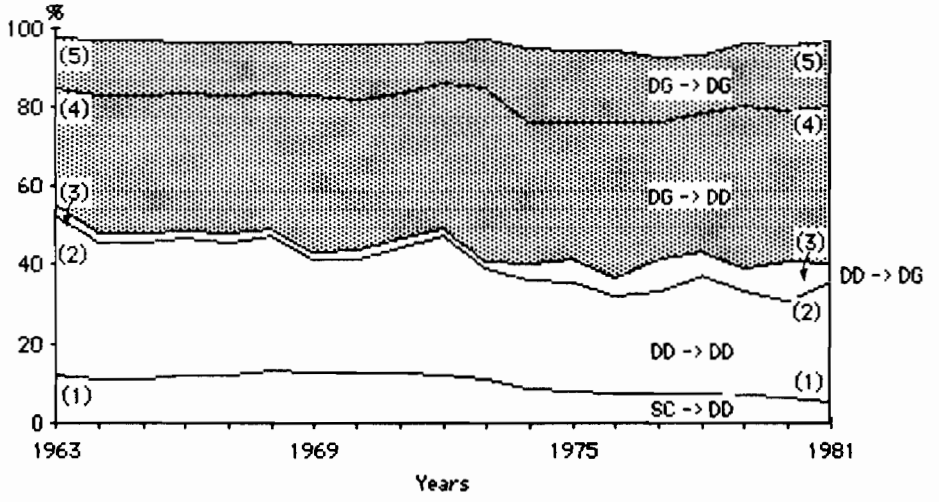

Figure 13B.15. Cumulative shares of world trade of flows of nonconiferous sawnwood between socialist, developed, and developing regions: (1) TSC/TDD; (2) TDD/TDD; (3) TDD/TDG; (4) TDG/TDD; (5) TDG/TDG.

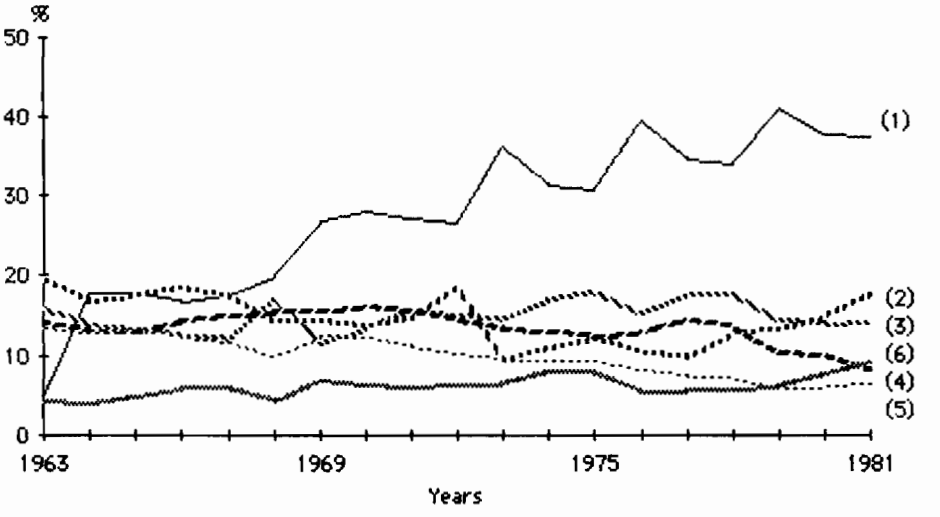

Figure 13B.16. Shares of world trade of major exporters of nonconiferous sawnwood: (1) ASE/TWO; (2) NAM/TWO; (3) WEU/TWO; (4) EEU/TWO; (5) AFR/TWO; (6) LAM/TWO.

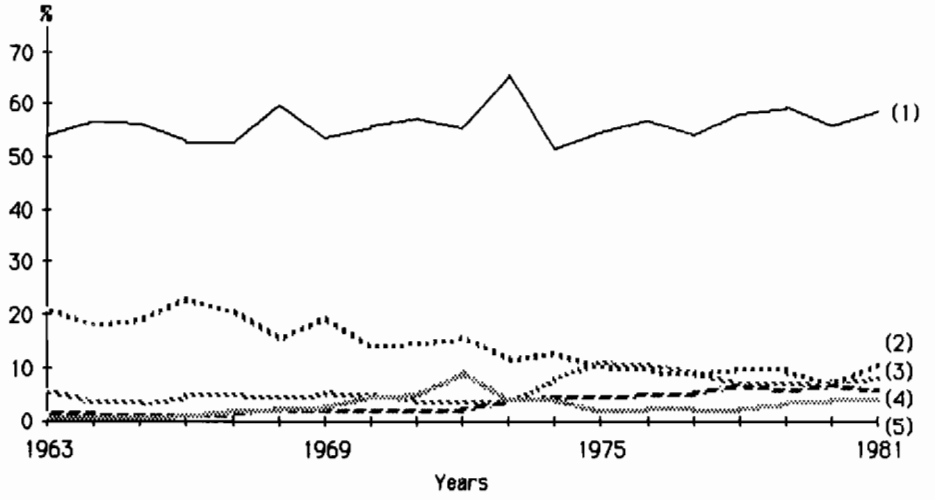

Figure 13B.17. Shares of world trade of major importers of nonconiferous sawnwood: (1) TWO/WEU; (2) TWO/NAM; (3) TWO/ASI; (4) TWO/ASE; (5) TWO/JAP.

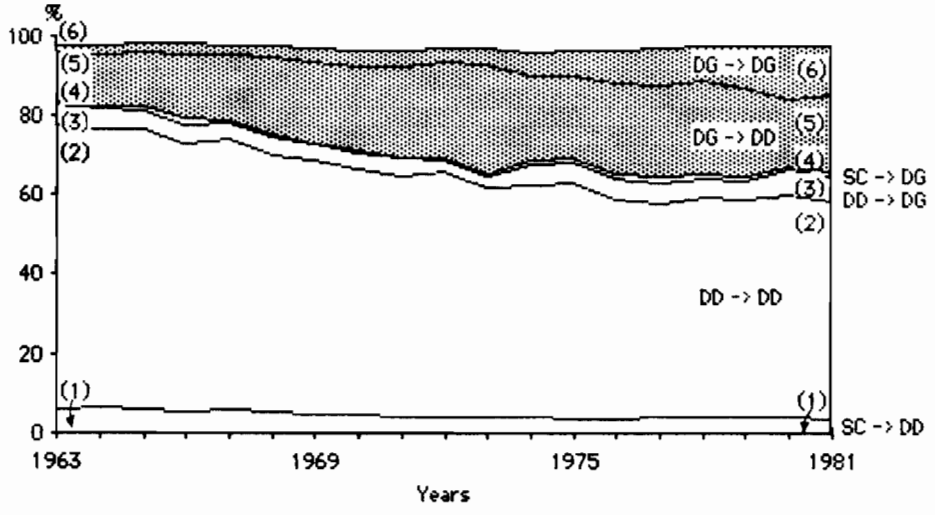

Figure 13B.18. Cumulative shares of world trade of flows of panels between socialist, developed, and developing regions: (1) TSC/TDD; (2) TDD/TDD; (3) TDD/TDG; (4) TSC/TDG; (5) TDG/TDD; (6) TDG/TDG.

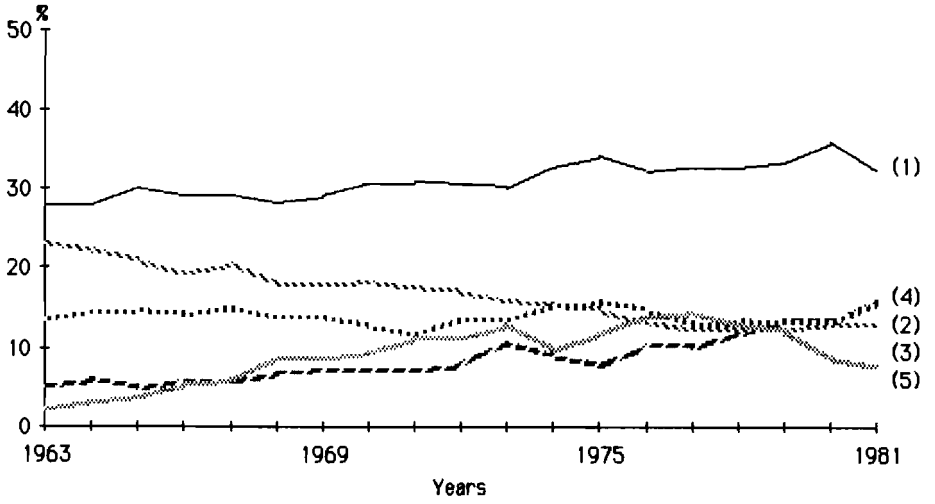

Figure 13B.19. Shares of world trade of major exporters of panels: (1) WEU/TWO; (2) ASE/TWO; (3) NAM/TWO; (4) NEU/TWO; (5) ASI/TWO.

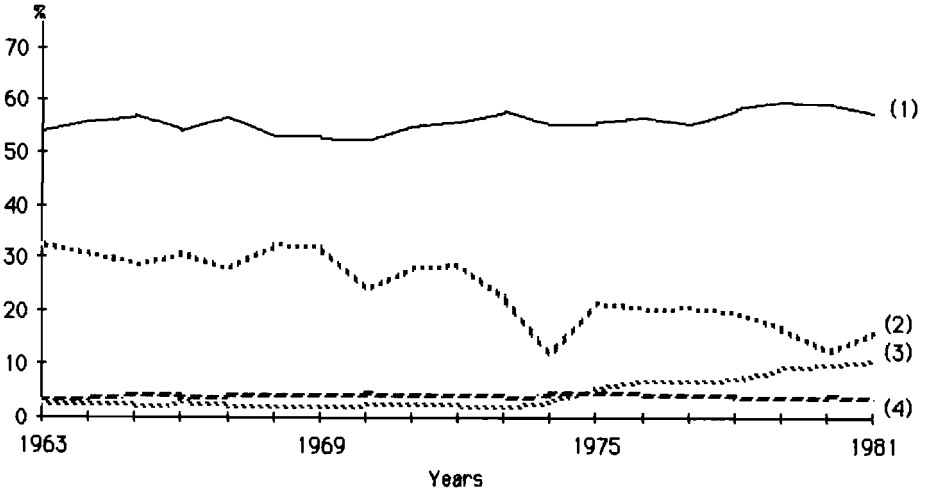

Figure 13B.20. Shares of world trade of major importers of panels: (1) TWO/WEU; (2) TWO/NAM; (3) TWO/ASI; (4) TWO/NEU.

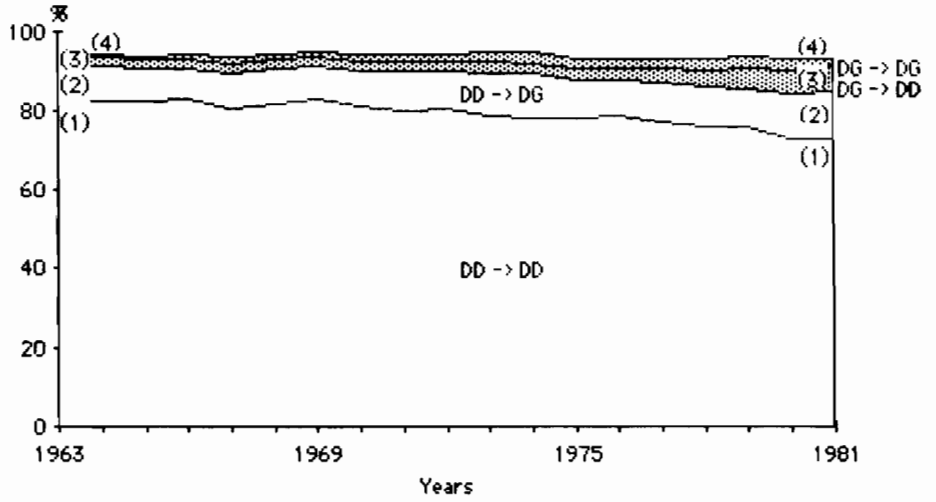

Figure 13B.21. Cumulative shares of world trade of flows of pulp between developed nonsocialist and developing regions: (1) TDD/TDD; (2) TDD/TDG; (3) TDG/TDD; (4) TDG/TDG.

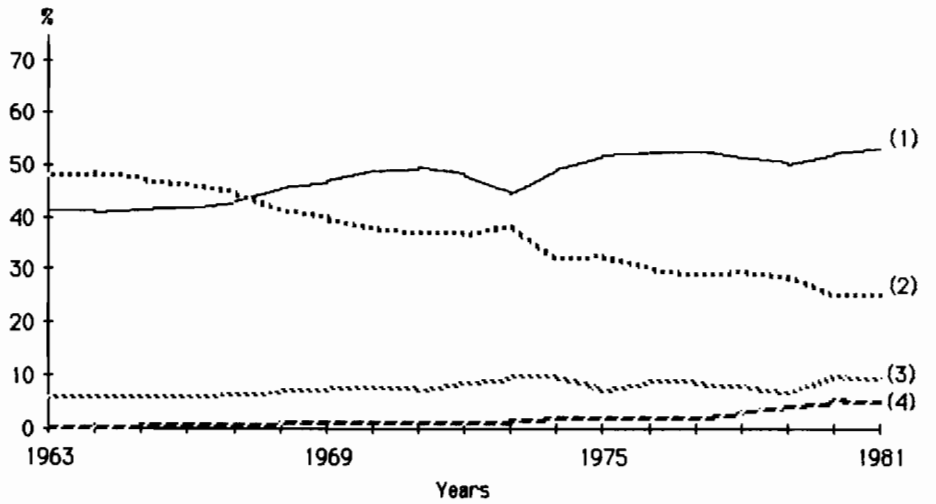

Figure 13B.22. Shares of world trade of major exporters of pulp: (1) NAM/TWO; (2) NEU/TWO; (3) WEU/TWO; (4) LAM/TWO.

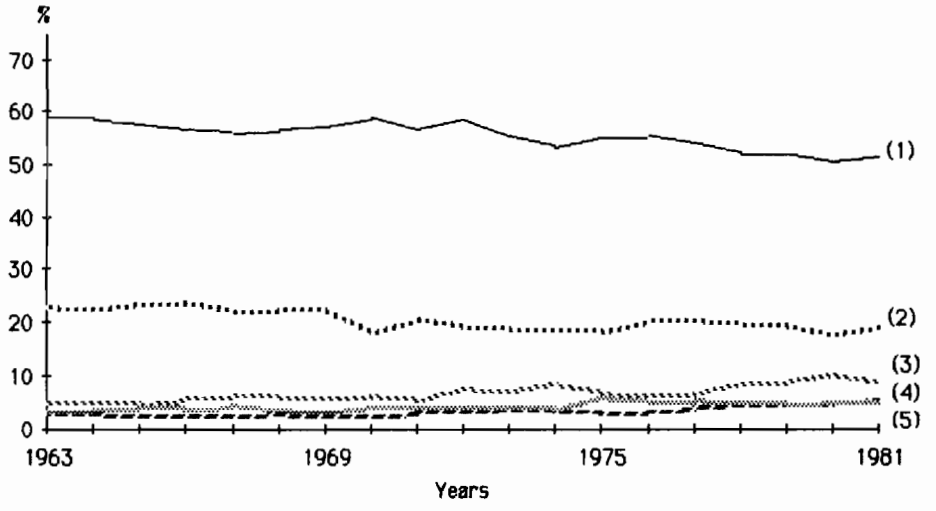

Figure 13B.23. Shares of world trade of major importers of pulp: (1) TWO/WEU; (2) TWO/NAM; (3) TWO/JAP; (4) TWO/ASI; (5) TWO/EEU.

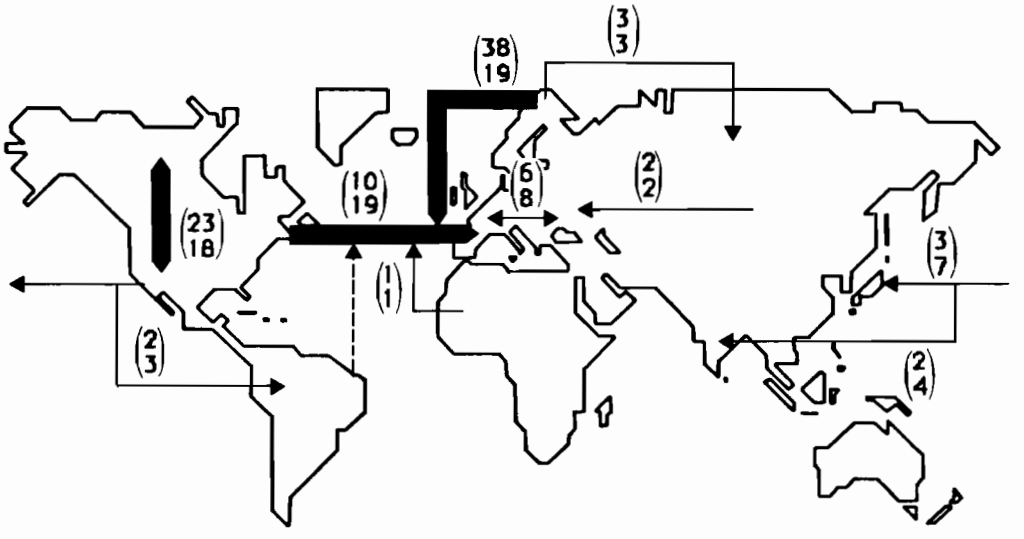

Figure 13B.24. Pulp: bilateral trade flows ≥ 1% of world trade in 1981; $\binom{1962}{1981}$ shares given; – – → flow ≥ 1% only since the late 1970s.

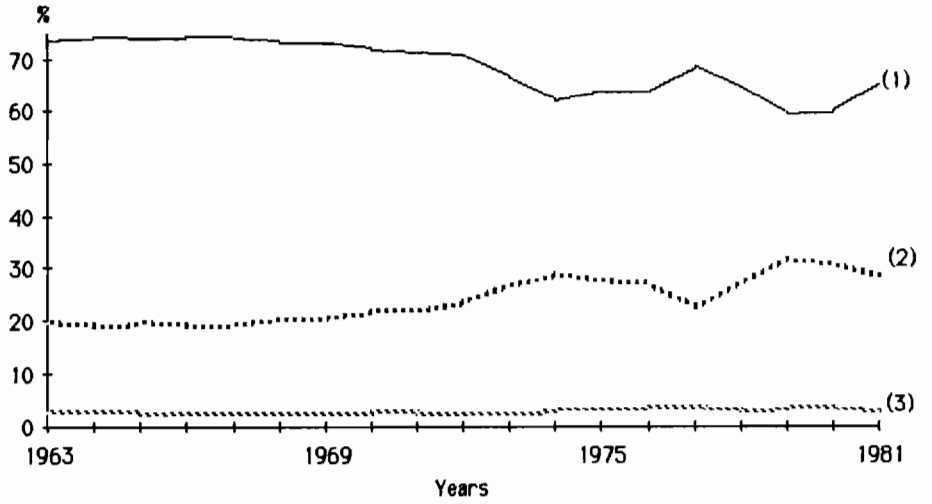

Figure 13B.25. Share of world trade of major exporters of newsprint: (1) NAM/TWO; (2) NEU/TWO; (3) WEU/TWO.

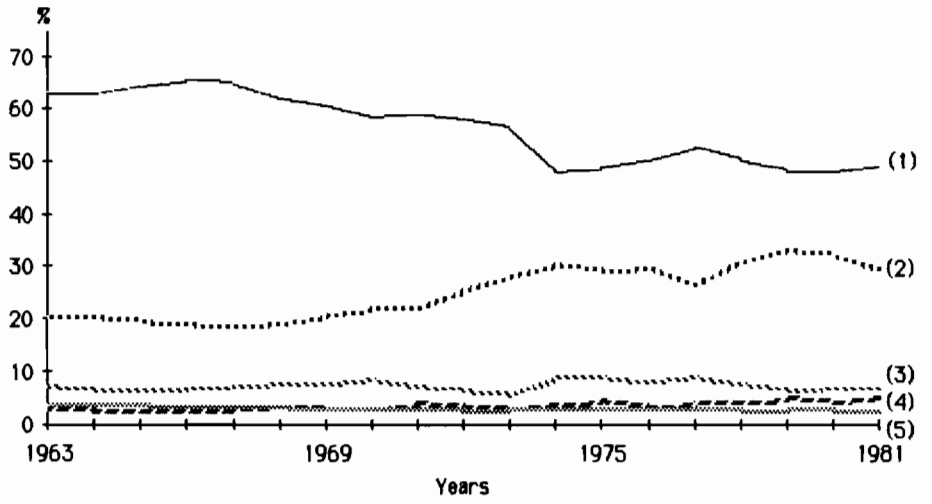

Figure 13B.26. Shares of world trade of major importers of newsprint: (1) TWO/NAM; (2) TWO/WEU; (3) TWO/LAM; (4) TWO/ASI; (5) TWO/OCE.

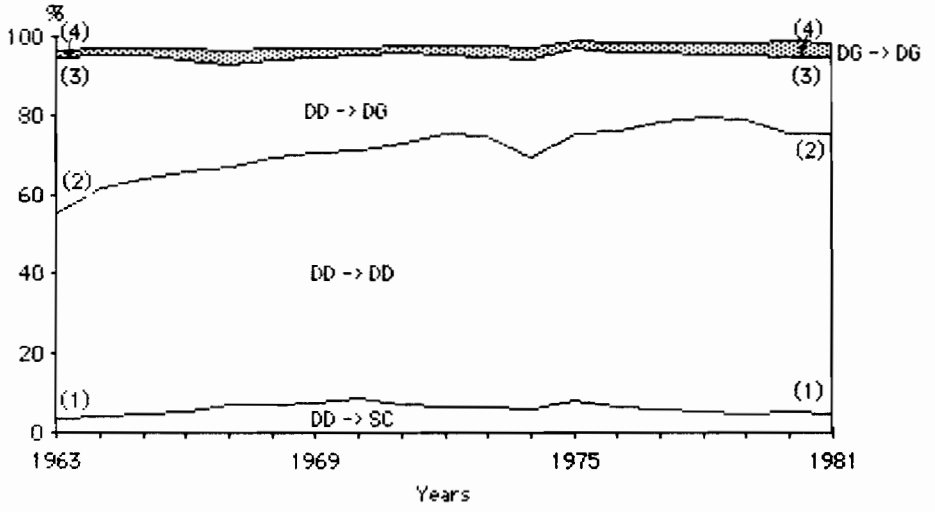

Figure 13B.27. Cumulative shares of world trade of "other printing and writing paper" flows between developed, socialist, and developing regions: (1) TDD/TSC; (2) TDD/TDD; (3) TDD/TDG; (4) TDG/TDG.

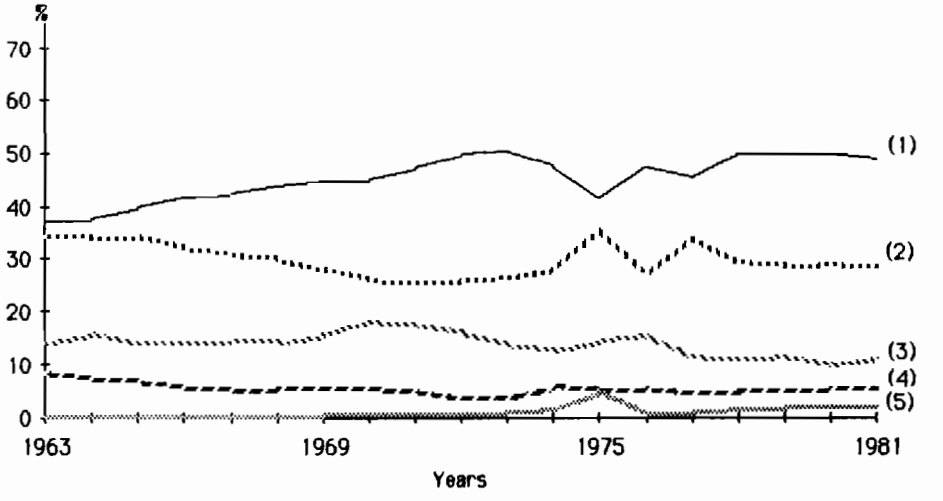

Figure 13B.28. Shares of world trade of major exporters of "other printing and writing paper": (1) WEU/TWO; (2) NEU/TWO; (3) NAM/TWO; (4) JAP/TWO; (5) LAM/TWO.

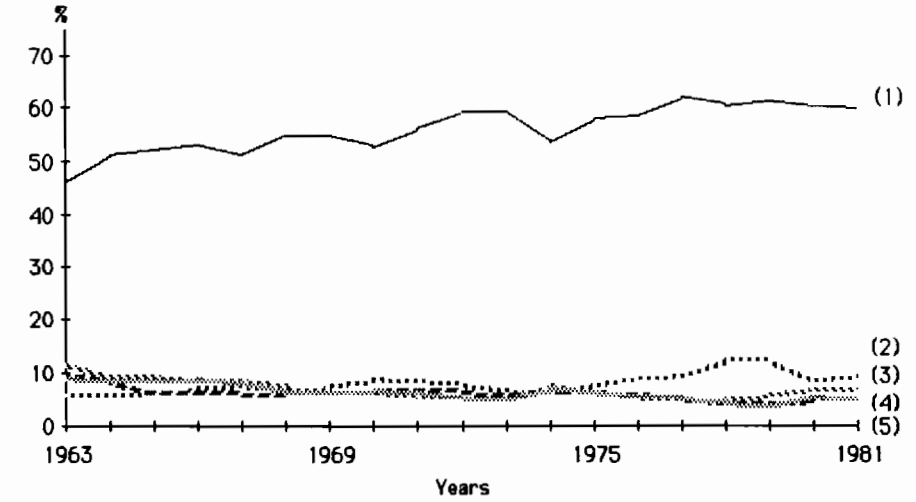

Figure 13B.29. Shares of world trade of major importers of "other printing and writing papers": (1) TWO/WEU; (2) TWO/NAM; (3) TWO/ASI; (4) TWO/LAM; (5) TWO/AFR.

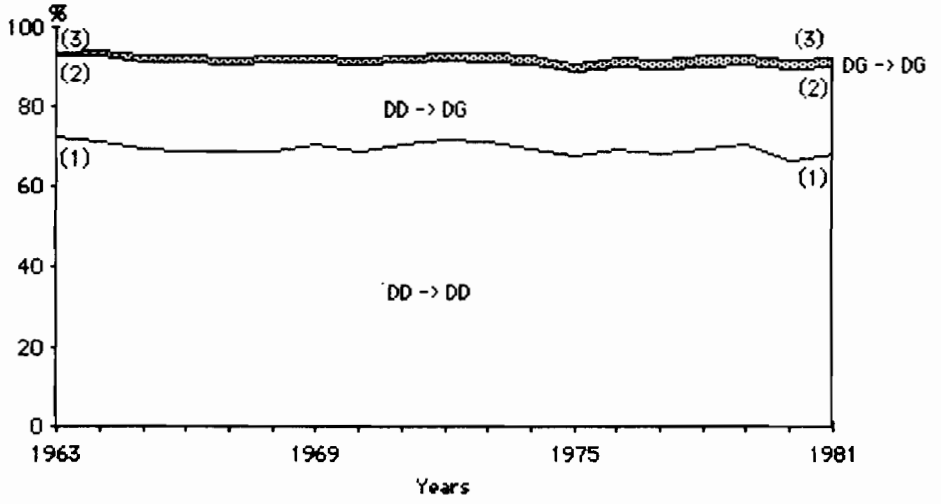

Figure 13B.30. Cumulative shares of world trade of "other paper and boards" flows between developed and developing regions: (1) TDD/TDD; (2) TDD/TDG; (3) TDG/TDG.

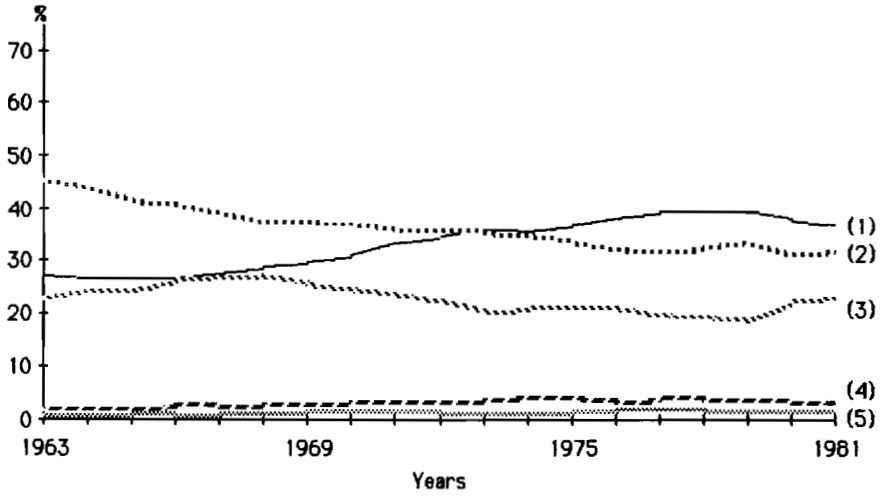

Figure 13B.31. Shares of world trade of major exporters of "other paper and boards": (1) WEU/TWO; (2) NEU/TWO; (3) NAM/TWO; (4) JAP/TWO; (5) EEU/TWO.

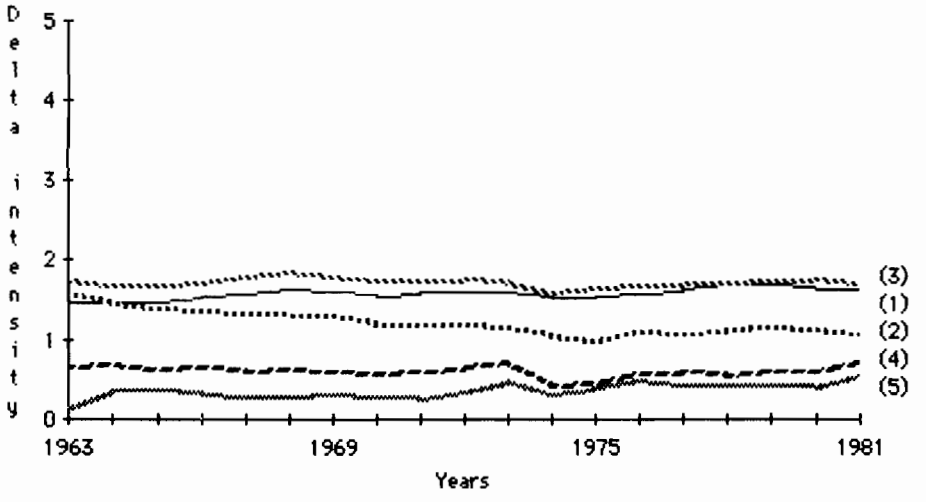

Figure 13B.32. Trade intensities of Western European imports of forest products: (1) WEU/WEU; (2) EEU/WEU; (3) AFR/WEU; (4) LAM/WEU; (5) ASE/WEU.

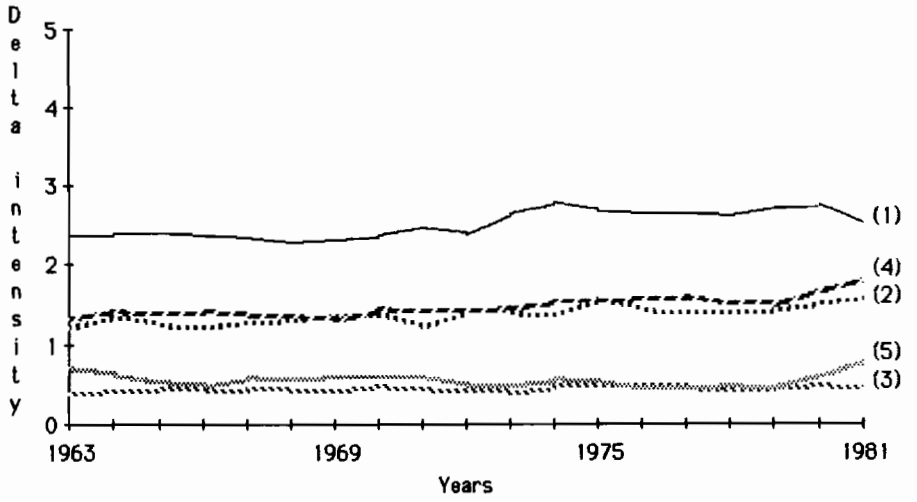

Figure 13B.33. Trade intensities of North American exports of all forest products: (1) NAM/NAM; (2) NAM/JAP; (3) NAM/WEU; (4) NAM/LAM; (5) NAM/ASI.

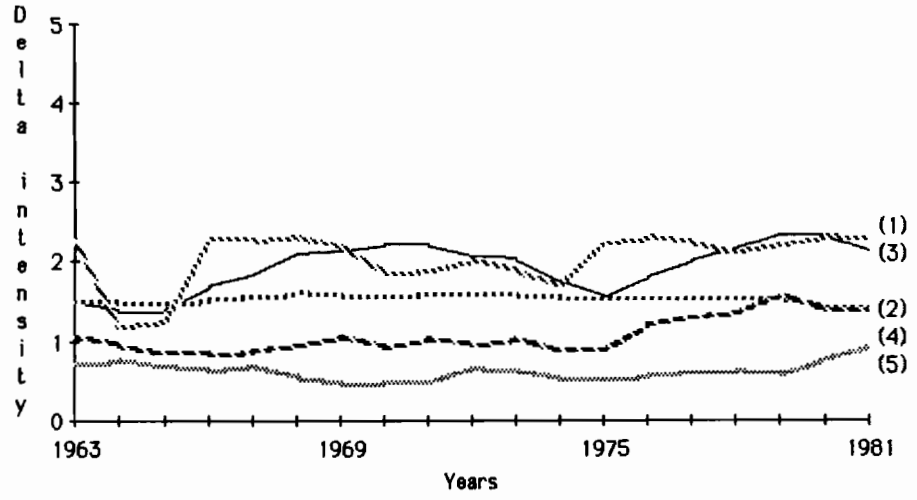

Figure 13B.34. Trade intensities of North European exports of all forest products: (1) NEU/NEU; (2) NEU/WEU; (3) NEU/EEU; (4) NEU/AFR; (5) NEU/ASI.

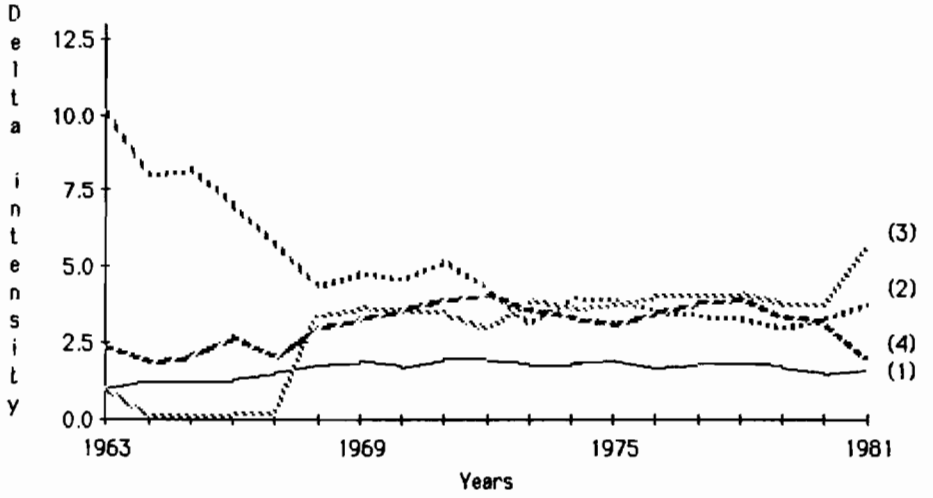

Figure 13B.35. Trade intensities of selected flows of all forest products: (1) EEU/JAP; (2) ASE/JAP; (3) ASE/ASE; (4) ASE/ASI.

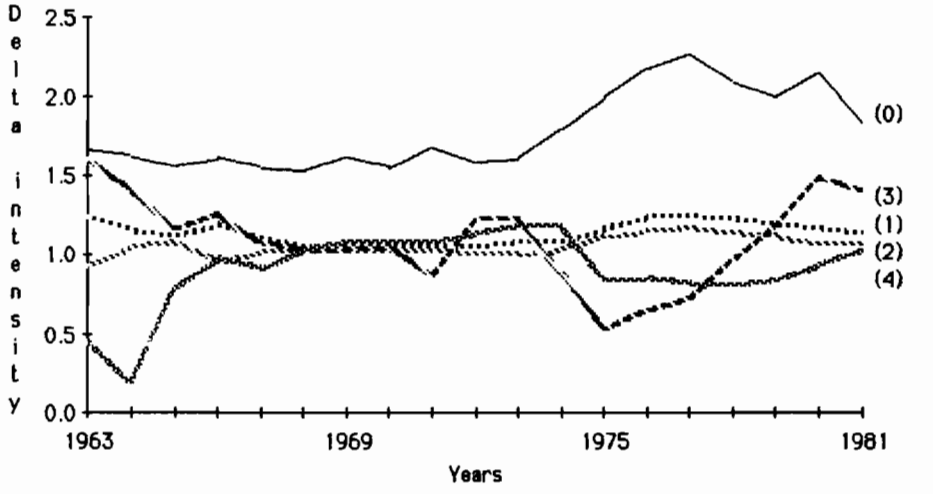

Figure 13B.36. Trade intensities of major flows of coniferous logs: (0) NAM/NAM; (1) NAM/JAP; (2) EEU/JAP; (3) EEU/WEU; (4) ASE/JAP.

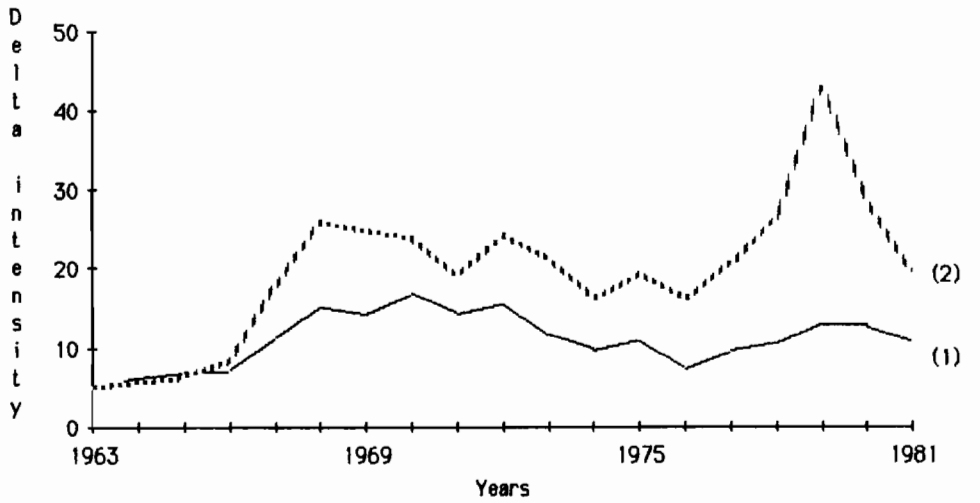

Figure 13B.37. Trade intensities of intraregional trade of coniferous logs in Northern and Western Europe: (1) WEU/WEU; (2) NEU/NEU.

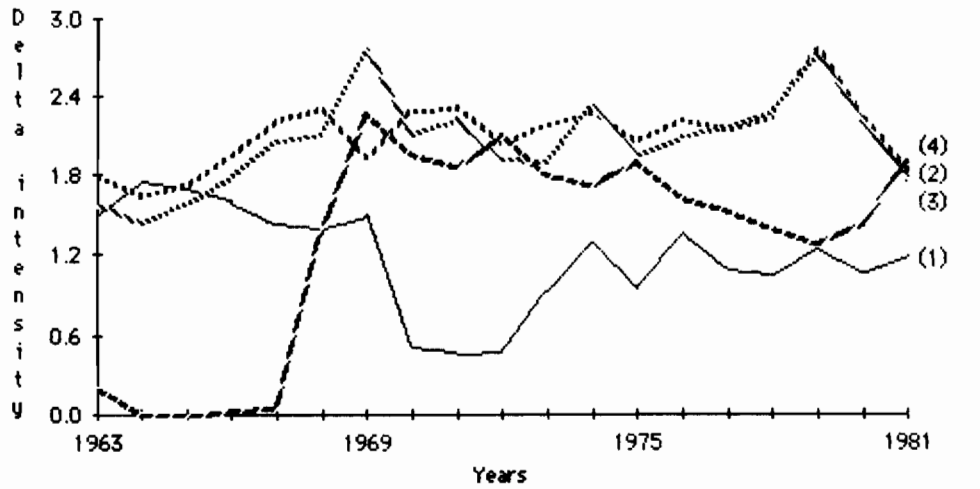

Figure 13B.38. Trade intensities of major flows of nonconiferous logs: (1) ASE/JAP; (2) AFR/WEU; (3) WEU/WEU; (4) ASE/ASE.

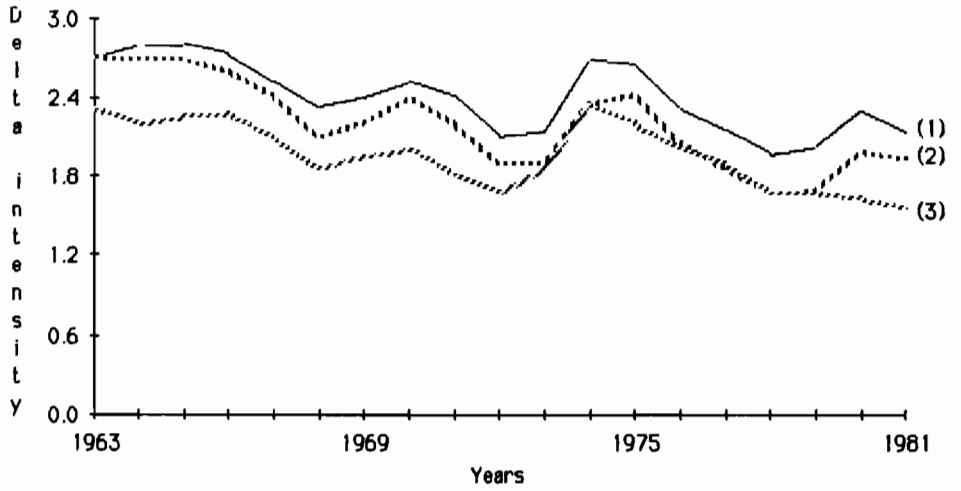

Figure 13B.39. Trade intensities of North American exports of coniferous sawnwood: (1) NAM/NAM; (2) NAM/JAP; (3) NAM/OCE.

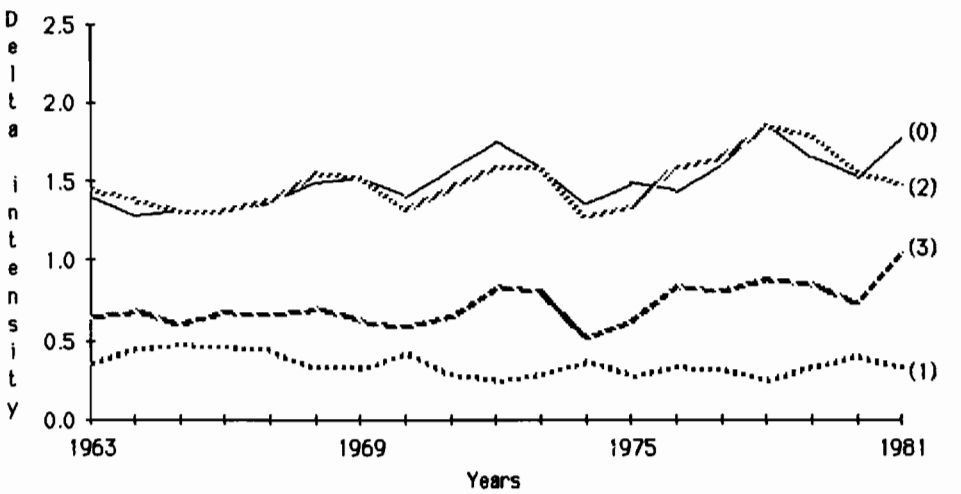

Figure 13B.40. Trade intensities of Western European imports of coniferous sawnwood: (0) WEU/WEU; (1) NAM/WEU; (2) EEU/WEU; (3) LAM/WEU.

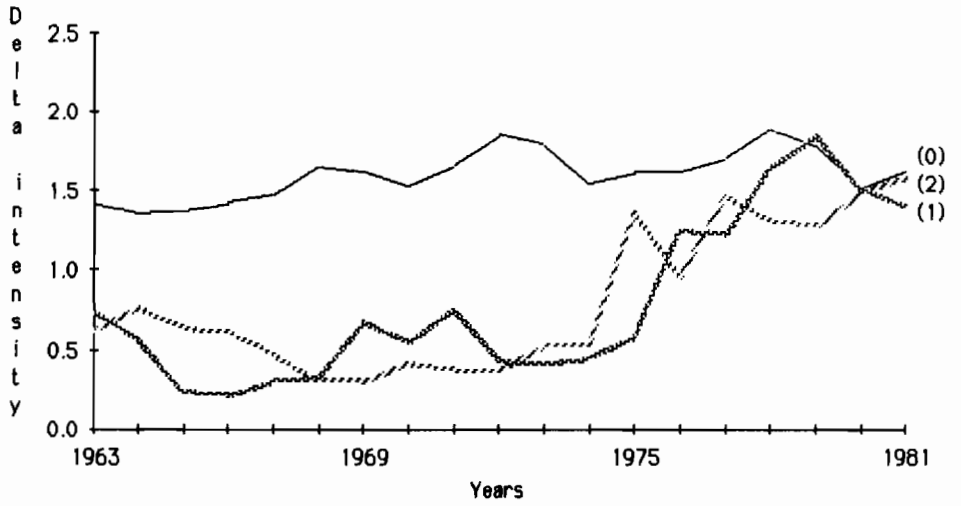

Figure 13B.41. Trade intensities of Northern European exports of coniferous sawnwood: (0) NEU/WEU; (1) NEU/AFR; (2) NEU/ASI.

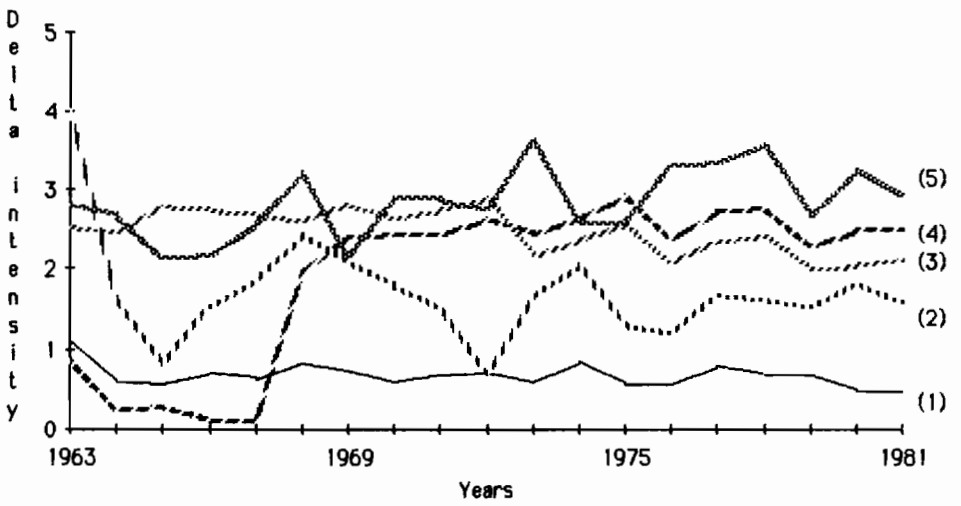

Figure 13B.42. Trade intensities of ASEAN and Latin American exports of nonconiferous sawnwood: (1) ASE/NAM; (2) ASE/JAP; (3) ASE/OCE; (4) ASE/ASE; (5) LAM/NAM.

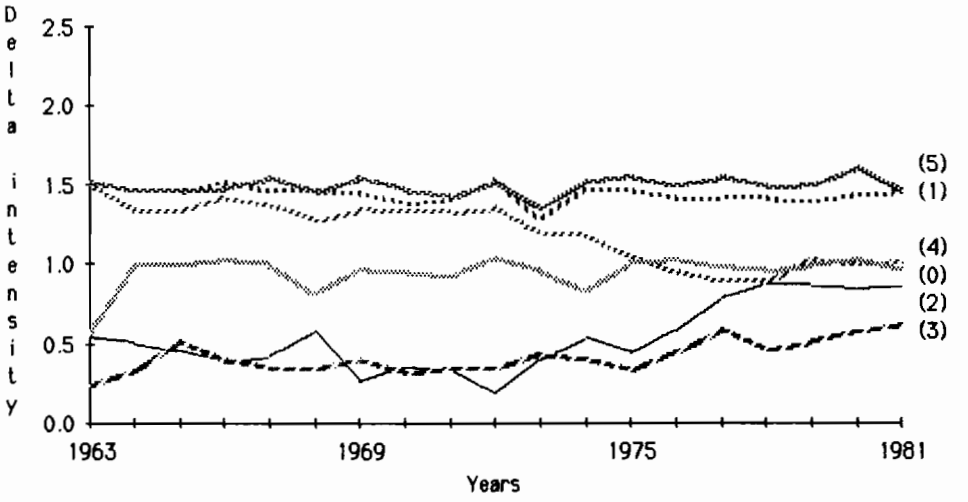

Figure 13B.43. Trade intensities of Western European imports of nonconiferous sawnwood: (0) NAM/WEU; (1) WEU/WEU; (2) EEU/WEU; (3) LAM/WEU; (4) ASE/WEU; (5) AFR/WEU.

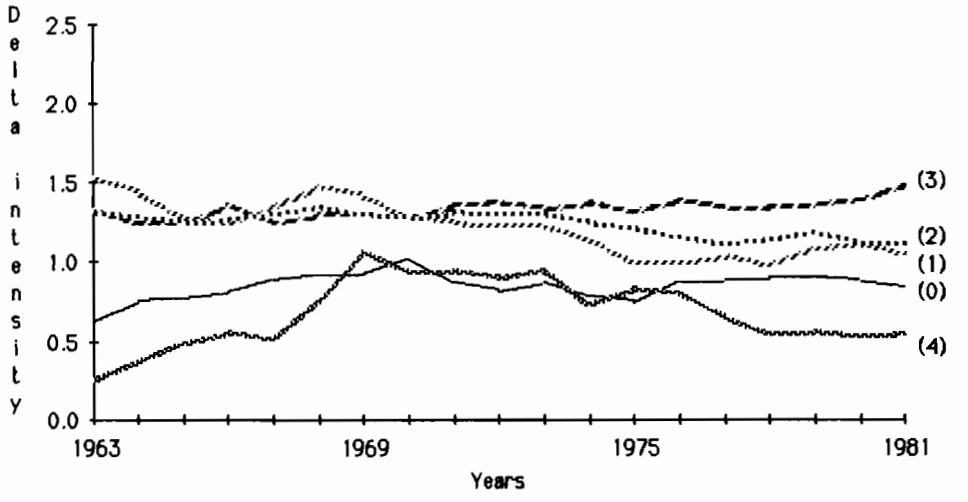

Figure 13B.44. Trade intensities of Western European imports of panels: (0) NAM/WEU; (1) NEU/WEU; (2) EEU/WEU; (3) AFR/WEU; (4) LAM/WEU.

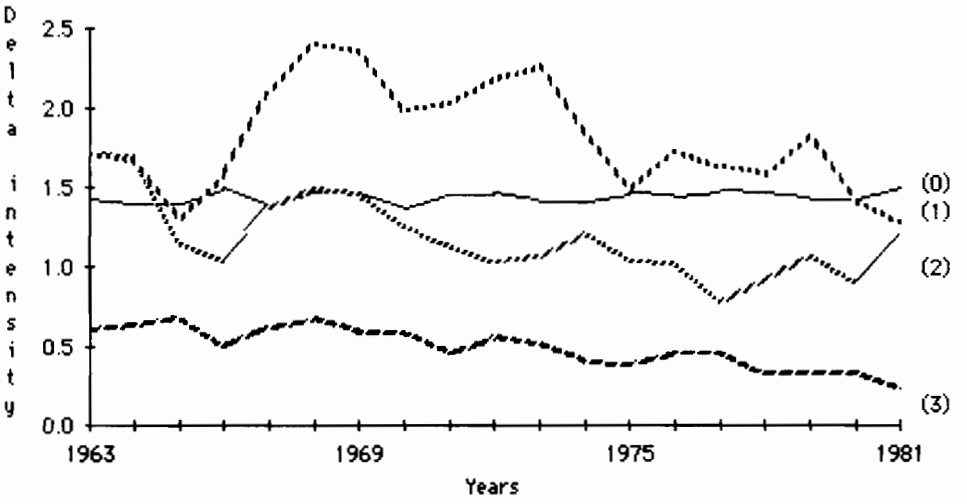

Figure 13B.45. Trade intensities of Western European exports of panels: (0) WEU/WEU; (1) WEU/EEU; (2) WEU/AFR; (3) WEU/ASI.

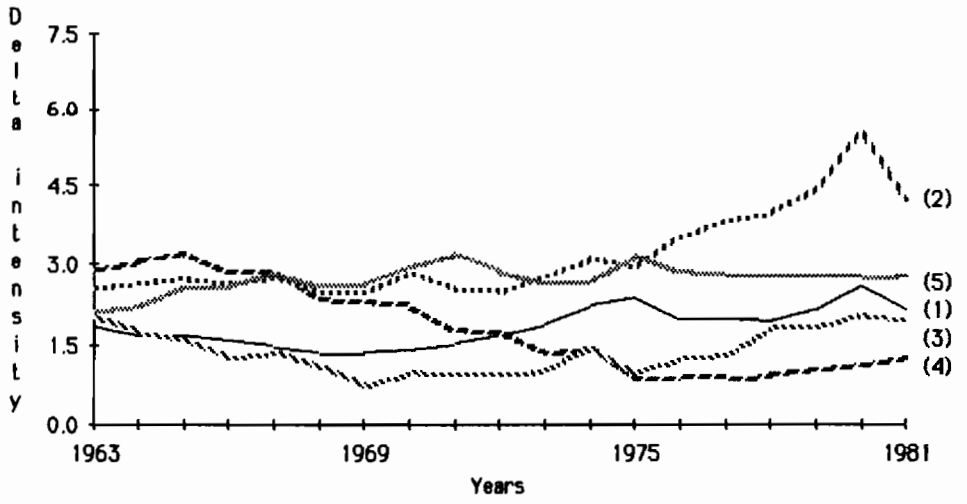

Figure 13B.46. Trade intensities of North American imports of panels: (1) NAM/NAM; (2) JAP/NAM; (3) LAM/NAM; (4) ASE/NAM; (5) ASI/NAM.

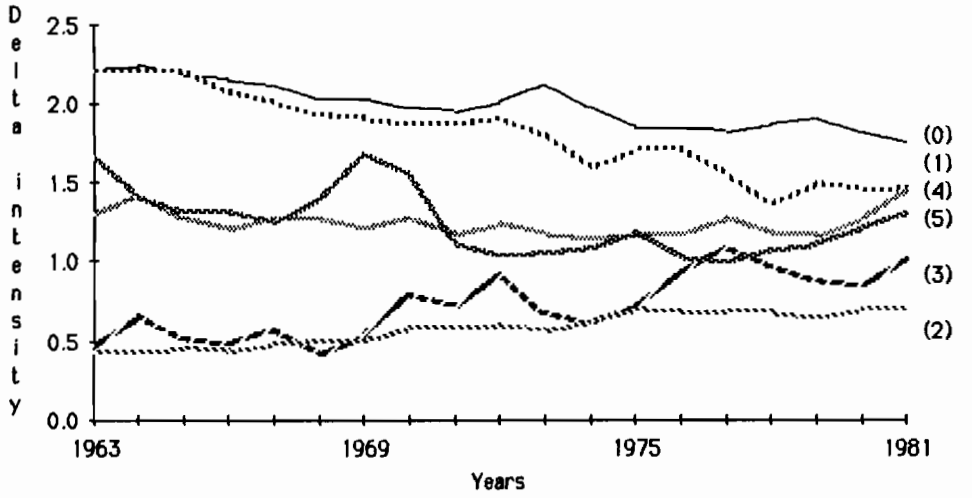

Figure 13B.47. Trade intensities of North American exports of pulp: (0) NAM/NAM; (1) NAM/JAP; (2) NAM/WEU; (3) NAM/AFR; (4) NAM/LAM; (5) NAM/ASI.

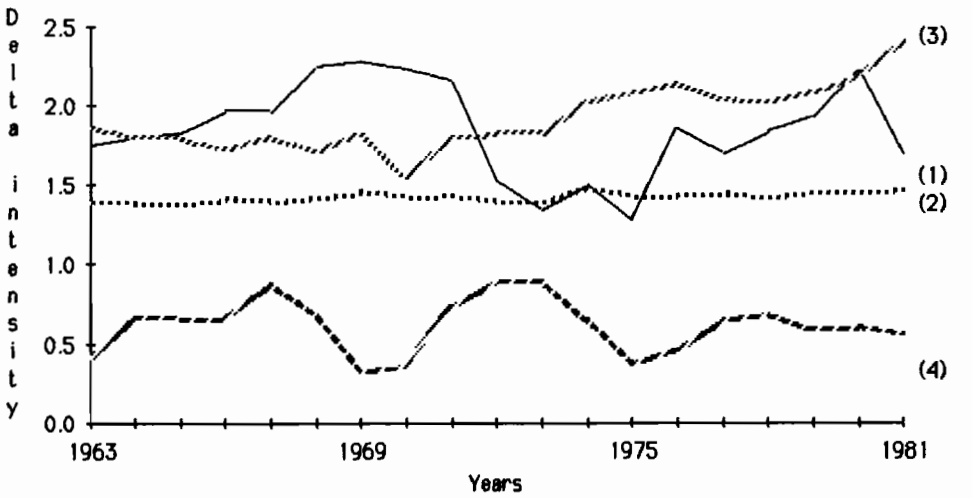

Figure 13B.48. Trade intensities of Northern European exports of pulp: (1) NEU/NEU; (2) NEU/WEU; (3) NEU/EEU; (4) NEU/ASI.

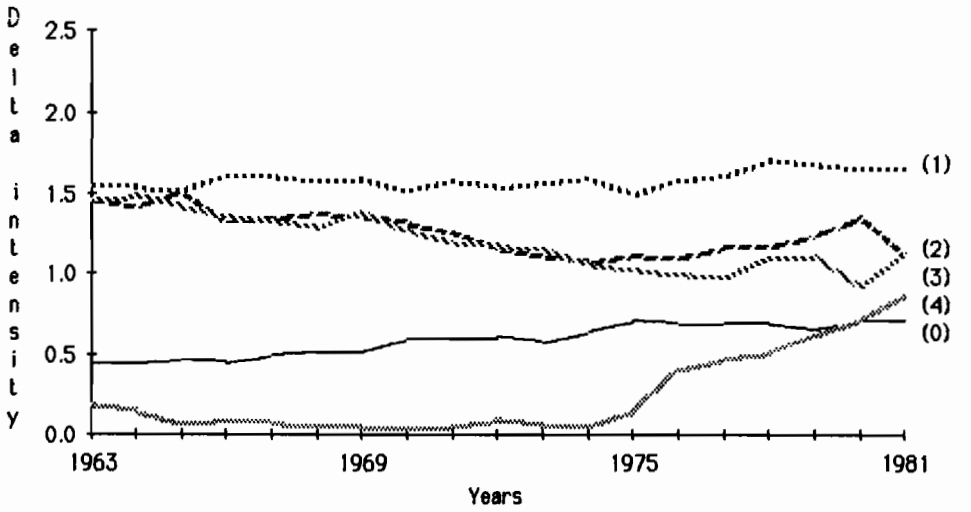

Figure 13B.49. Trade intensities of Western European imports of pulp: (0) NAM/WEU; (1) WEU/WEU; (2) EEU/WEU; (3) AFR/WEU; (4) LAM/WEU.

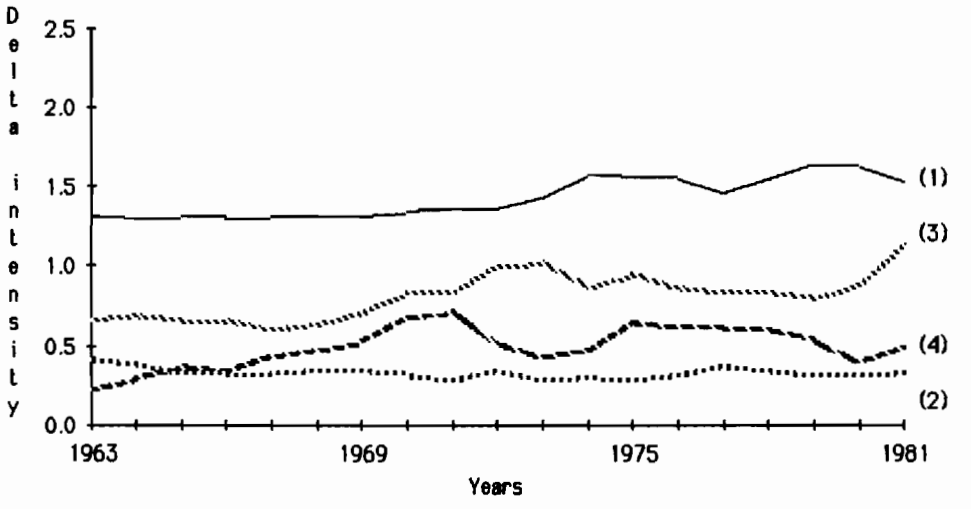

Figure 13B.50. Trade intensities of North American exports of newsprint: (1) NAM/NAM; (2) NAM/WEU; (3) NAM/LAM; (4) NAM/ASI.

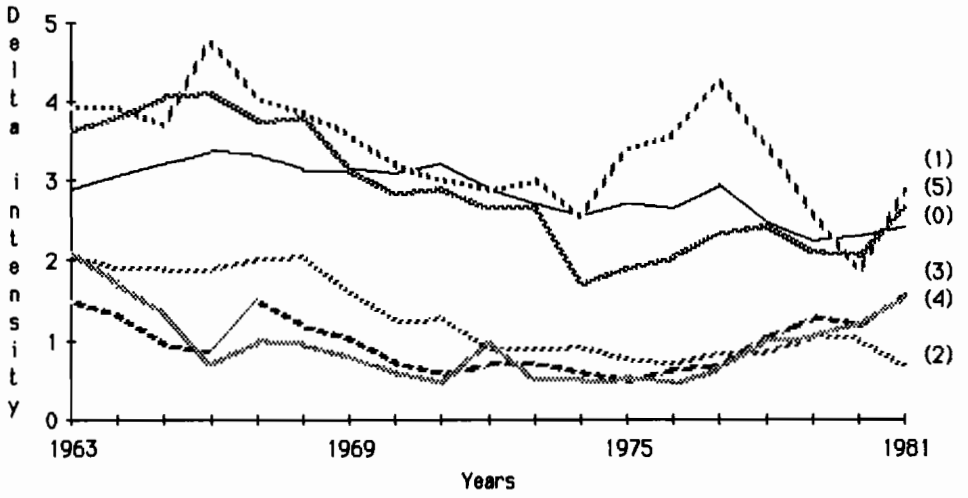

Figure 13B.51. Trade intensities of Northern European exports Western European intraregional trade of newsprint: (0) NEU/WEU; (1) NEU/EEU; (2) NEU/LAM; (3) NEU/ASE; (4) NEU/ASI; (5) WEU/WEU.

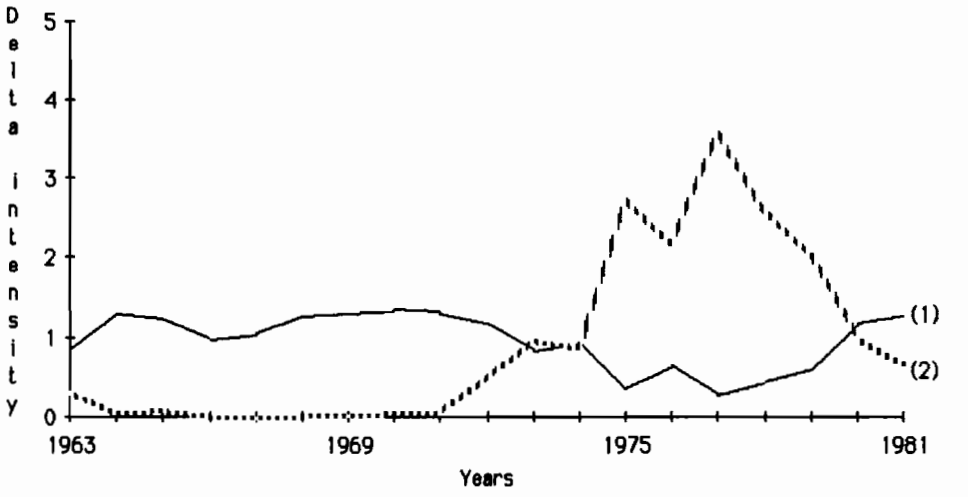

Figure 13B.52. Trade intensities of Japanese imports of newsprint: (1) NAM/JAP; (2) NEU/JAP.

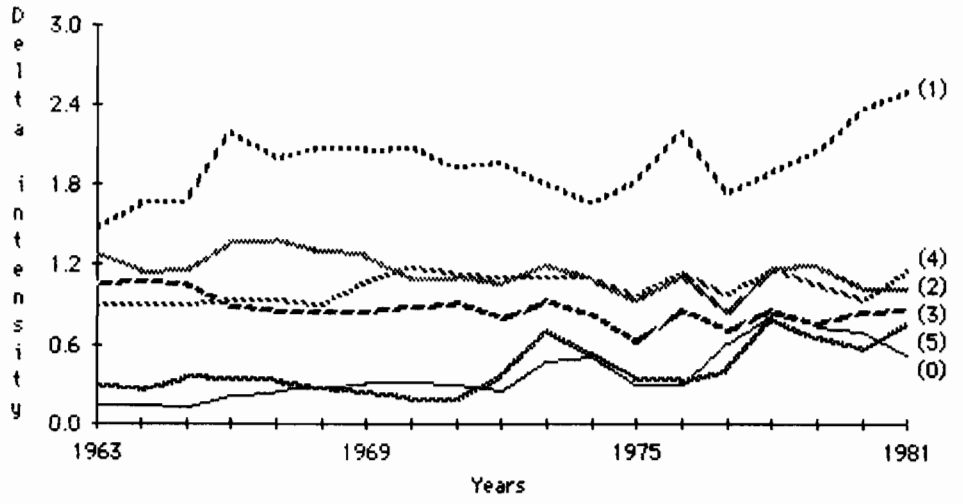

Figure 13B.53. Trade intensities of Northern European exports of "printing and writing paper": (0) NEU/NAM; (1) NEU/EEU; (2) NEU/OCE; (3) NEU/AFR; (4) NEU/LAM; (5) NEU/ASI.

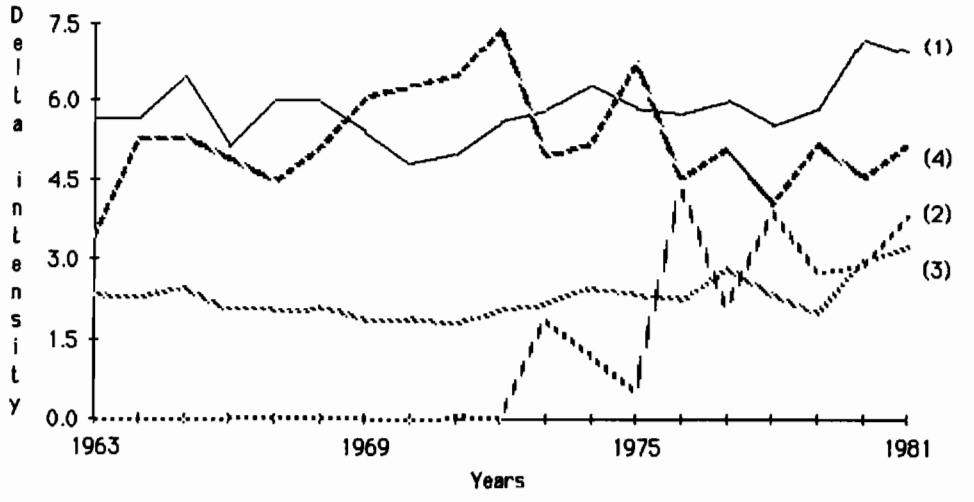

Figure 13B.54. Trade intensities of selected flows of "printing and writing paper": (1) NAM/NAM; (2) NAM/LAM; (3) LAM/ASI; (4) JAP/ASI.

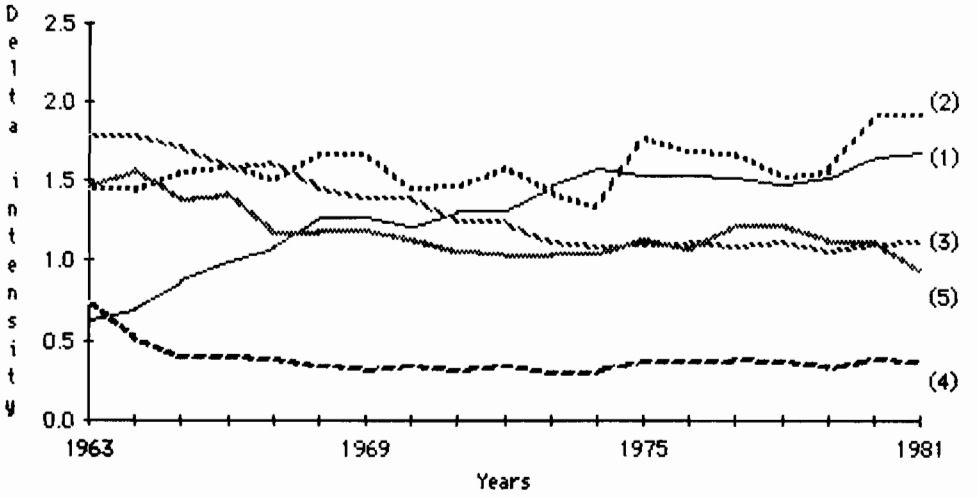

Figure 13B.55. Trade intensities of Northern and Western European exports of "other paper and board": (1) NEU/NEU; (2) NEU/EEU; (3) WEU/NEU; (4) WEU/NAM; (5) WEU/AFR.

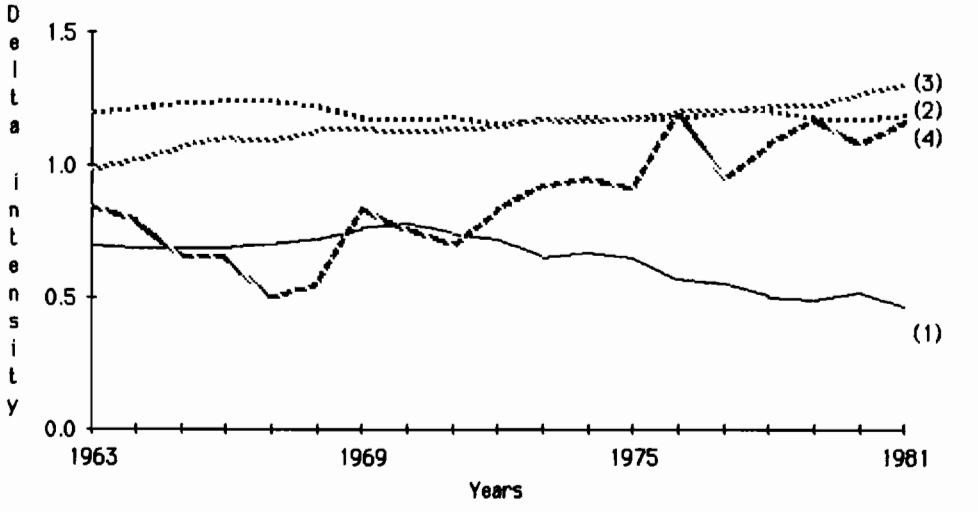

Figure 13B.56. Trade intensities of Western European imports of "other paper and board": (1) NAM/WEU; (2) NEU/WEU; (3) WEU/WEU; (4) EEU/WEU.

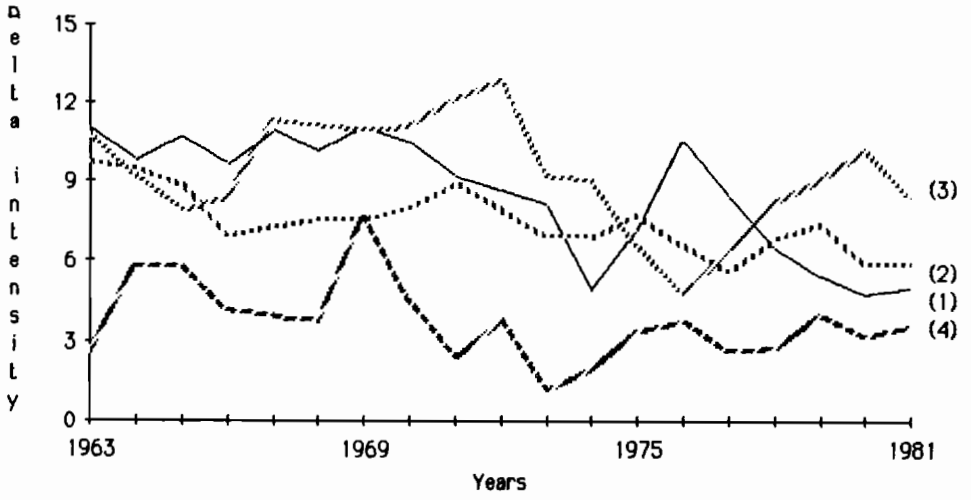

Figure 13B.57. Trade intensities of Japanese and Oceania exports of "other paper and board": (1) JAP/ASE; (2) JAP/ASI; (3) OCE/ASE; (4) OCE/ASI.

Acknowledgment

In the original paper by Francescon *et al.* (1983), a third part was written by G. Kornai, applying gravitational models to study the factors influencing trade of forest products. As the results were not satisfactory, it has been excluded here. G. Kornai was very helpful in collecting and processing the data used in this chapter, for which we express our gratitude.

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International Trade in Forest Products

Edited by András Nagy

IIASA

This book is the outcome of an international collaborative effort within the Forest Sector Project at the International Institute for Applied Systems Analysis. The aim was to analyse current trends and future prospects of the worldwide forest sector from the standpoint of applied systems analysis, which focuses on long-term, complex policymaking problems of a global or universal character. To highlight scenarios and policy options at strategic and geographically diversified levels, modelling is often essential, but is not enough. The applied nature of the project requires intensive empirical work, based on the best available statistical data as well as extensive discussions and interviews with decisionmakers and other experts operating in the international environment. This book primarily reflects this applied emphasis.

International Trade in Forest Products will be a useful complement to the modelling and other quantitative sections of the project, published in the *Global Forest Sector: An Analytical Perspective,* and in the TIMS volume.

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