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Title: U.S. - E.E.C. TRADE IN KRAFT LINERBOARD: A STUDY OF CURRENT AND FUTURE U.S. EXPORTS AND MARKETING PRACTICES

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This study attempts to show that competitive advantage alone does not determine the directions of trade in kraft liner. Trade depends on comparative advantage and especially on familiarity with foreign demand.

Implications from international trade theories guided this study of trade in kraft liner. Future demand in the E.E.C. for foreign kraft liner was deduced from estimates of corrugated production related to a basic economic indicator in each member country.

The competitive advantage of each supplying area -- British Columbia, Eastern Canada, Sweden, Finland and the Southern United States -- was obtained by analyzing production and transportation costs to the E.E.C. The competitive advantage of each supplying area -- defined as the difference between the CIF price and total cost (production plus transportation costs) -- was calculated in order to see if it explained fully past and actual directions of trade. As the U.S. domestic market represents an alternative to export, the possible influence of domestic

trade on export was also considered. Marketing efforts developed in the E.E.C. by U.S. firms were used to explain discrepancies between actual trade and that indicated by competitive advantage. A survey of U.S. firms' export marketing practices in the E.E.C. showed that the channel of distribution and product differentiation were important factors in determining trade.

The relation between probability of repeated exports (export loyalty) and sales abroad of U.S. subsidiaries in the pulp and paper industry were shown by use of a Markov chain process. This model was then used to determine the E.E.C.'s future share of U.S. exports of kraft liner. A regression model was developed to formulate relevant economic relationships so as to predict the future level of U.S. exports of kraft liner to the E.E.C.

Finally, implications were drawn concerning techniques of export prediction and an appropriate marketing strategy for a potential exporter.

U.S.- E.E.C. Trade in Kraft Linerboard
A Study of Current and Future U.S. Exports and Marketing Practices

by

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A STUDY OF CURRENT AND FUTURE U.S. EXPORTS AND MARKETING PRACTICES

I. INTRODUCTION

Pulp and newsprint have historically been the two major commodities traded in the international trade of pulp and paper (Hunter, 1952; Guthrie, 1941). Recently, however, kraft liner has become an important part of international trade. Kraft liner is a high quality paperboard from which corrugated and solid fibreboard are manufactured, both being used for packing, storing and transporting commodities. Their uses have increased recently throughout the world, particularly in industrial countries. There is a world wide increase in demand for the component kraft liner, which has become the major net pulp and paper commodity exported from the United States.

The European Economic Community (E.E.C.) -- including Belgium, France, Germany, Italy, Luxembourg and the Netherlands -- imports substantial quantities of kraft liner. Traditionally these countries have been supplied from Scandinavian sources, but recently the United States has begun to participate in supplying this market.

Relating to this trend, a U.S. manufacturer and potential exporter of kraft linerboard might ask: "Are exports of kraft linerboard from the United States to the E.E.C. likely to increase even further?" and "What marketing problems are involved in exporting to the E.E.C.?" The goal of this study is to find answers to these questions.

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[1]See Appendix A for description.

However, in this study related matters are also tackled, such as: "What is the level of future foreign demand in the E.E.C.? What is the competitive advantage of the United States in the face of the Scandinavian countries, and its probable trend? Which region of the United States is likely to export to the E.E.C. in the future? What is the probability of repeated exports to the E.E.C. by U.S. exporters (export loyalty)? What determinant of trade in kraft liner is likely to be the most important? Which technique should be used to forecast exports?"

International trade theories are used in Chapter II as a guide for the study of trade in kraft liner. The principle of comparative advantage and the Heckscher-Ohlin theory are examined in order to draw implications for one-commodity trade. Burenstam-Linder's explanation of trade emphasizing the role of familiarity with foreign demand is also analyzed.

Chapter III is devoted to an investigation of demand for corrugated board in the E.E.C., from which kraft linerboard demand is deduced. The level of future consumption of kraft liner in the E.E.C. is estimated through 1975.

The competitive position of areas supplying kraft liner to the E.E.C. is examined in Chapter IV, the competitive position of each supplying area being determined by the estimated margin (gross profit) from exporting kraft liner to the E.E.C. Results are tested against one kind of indirect evidence of competitive advantage, past direction of trade. The possible influence of the U.S. market on exports is also examined.

The behavior of individual exporting firms is shown in Chapter V in order to (1) explain discrepancies between actual trade and that predicted by the study of competitive advantage, and (2) analyze how U.S. exporting firms have organized the international marketing of kraft liner. Under the heading of pricing policy an economic model has been developed to understand better the relationships between cost, demand, supply and international price.

In Chapter VI information from previous chapters is integrated in two models. The first one determines, through a Markov chain process, the potential market for U.S. exports to the E.E.C. as compared to alternatives (Latin America, the Far East and other areas). The second model is a forecasting equation which attempts to formulate relevant economic relationships in terms of a mathematical equation to predict future exports of kraft liner from the United States.

A final chapter summarizes results and important implications, among them techniques of export prediction and an eventual marketing strategy for a potential exporter.

II. INTERNATIONAL TRADE THEORY AS A GUIDE FOR THE STUDY OF TRADE IN KRAFT LINER

Introduction

The purpose of this chapter is to determine causes of trade in order to explain U.S. exports of kraft liner. First the extent to which the principle of comparative advantage can be applied is demonstrated. Next the Heckscher-Ohlin theory, stressing factor endowment, is used to show the important determinants of trade. Finally, other factors such as the influence of demand and information flows on trade are examined. Implications are drawn from these theories for studying the trade of U.S. kraft linerboard to the E.E.C.

The Principle of Comparative Advantage

A large part of classical, neoclassical and modern theories of international trade are based on the doctrine of comparative advantage, first presented by David Ricardo. Ricardo's well-known example concerning trade of cloth and wine between England and Portugal shows that both countries will benefit if each specializes in production of the commodity having relatively lower production costs. Relatively refers to the relation to other commodities in the same country. In other words, each country specializes in that commodity in which it has a comparative advantage.

The principle of comparative advantage is not limited to trade in the two-country, two-commodity model. It remains valid and applicable to the more complex, actual situation of trade in thousands of

commodities among a large number of countries. Each country will specialize in, and export, those commodities in which it has a comparative advantage. The principle of comparative advantage applied to the determination of trade in a commodity in the real world necessitates not only knowledge of the monetary costs of this commodity but also knowledge of the costs of all commodities on the domestic and foreign market. Although acquisition of this extensive knowledge would be valuable to decision makers at the national level, it is beyond the scope of a study of international trade in one commodity.

In conclusion, the principle of comparative advantage is the basis for determination of trade. Its rather complex nature prevents it from being easily applied to one-commodity trade. Therefore, rather than exact measurement of comparative advantage, it seems more promising, and simpler, to investigate some of the reasons for a country's comparative advantage. For this purpose, the Hecksher-Ohlin theory is described.

The Hecksher-Ohlin Theory

The "factor endowment" or "factor proportion" theory, which was developed by the Swedish economists Eli Hecksher and Bertil Ohlin, seeks to explain why individual countries possess a comparative advantage in the export of given products. The essence of the Hecksher-Ohlin theory is simply that:

> Each region has an advantage in the production of commodities into which enter considerable amounts of factors abundant and cheap in that region. (Ohlin, 1966, p. 12)

Relative scarcity tends to be reflected in prices, and the products

embodying a relatively high proportion of abundant factors are likely to be less expensive than those containing more of the scarce ones. As trade between nations opens up, a country's export list will be heavily weighted with products containing a high proportion of its abundant factors, while imports will be biased toward items containing a high proportion of scarce factors.

This theory seems quite satisfactory, but it should be tested to determine its relevance to the real world. Although the classical comparative advantage proposition has been tested positively by G.D.A. McDougall (1951), by comparing the nature of trade between Great Britain and the United States, it has not been possible to test rigorously the Hecksher-Ohlin theory. One extensive attempt was made by W.W. Leontief. His results, however, have drawn a stream of comments (Cave, 1962) and given birth to the so-called "Leontief Paradox".

Contrary to preconceptions about the United States, Leontief's findings indicated that the manufacture of U.S. exports required a higher proportion of labor to capital than the manufacture of "import competing goods", the United States being considered as having more capital per worker than any of the countries with which it trades.

Leontief tried to reconcile his findings with the factor proportion approach. He concluded that, contrary to earlier expectations, the United States is indeed a labor-intensive country. The quality of U.S. labor makes up for its relatively small quantity and increases productivity to such an extent that labor is relatively abundant in relation to capital. Leontief explained his findings by stating that U.S. and foreign labor are different factors of production.

This interpretation of the factor proportion approach does not affect the policy guidelines implicit in the Hecksher-Ohlin theory: a country should give priority to the manufacture of products containing a high proportion of locally abundant factors. The meaning of factors, however, must be interpreted in a broader sense, "labor" and "skilled labor" being two different factors. The theory thus remains relevant.

The theories of international trade presented thus far have emphasized production factors and costs as elements determining comparative advantage. Other elements, such as demand patterns and information flows, which similarly affect both volume and composition of trade, have not been considered. The importance of these other factors is stressed and their impact on trade analyzed in the following section.

Role of Information Flows and Income in International Trade

At present, international trade theory is stated in terms of many factors of production: many different grades of labor, land, climate, natural resources, capital, entrepreneurship and management. However, there is another important factor that is often understated: familiarity with demand in foreign markets. Entrepreneurs undertake the manufacture of a product in response to needs of which they must be aware. This point was forcefully stated by C. Kindleberger (1962, p. 16):

> Over the horizon (of the perfectly rational man) there may be brilliant opportunities to improve his welfare as a consumer, or his income as a producer, but unless he is made aware of them, they will avail him nothing.

The importance of familiarity with foreign markets has been emphasized by Burenstam-Linder as well. He also stresses the role of income as an important influence on demand patterns. Income, more than any

other variable, appears to determine the consumption and purchasing habits of a population. If this is the case, "similarity of average income levels could be used as an index of similarity of demand structure" (Burenstam-Linder, 1961, p. 94). From this observation Burenstam-Linder deduced that countries having similar income levels are likely to trade with each other more intensively than countries having different income levels. This explanation of trade is easily applied to manufactured and high income products, but is less acceptable for primary products. Primary products may be demanded over wide income ranges, and they may be exported even though not in demand at home Therefore only part of Burenstam-Linder's explanation of trade applies to primary products. Familiarity with foreign demand remains valid, however, as a determinant of trade.

Summary and Implications for the Study of Trade in Kraft Liner

The general survey of international theories has demonstrated several important elements determining trade. Countries specialize in commodities for which they have a comparative advantage, which, however, is not easily measured. The Heckscher- Ohlin theory has shown that analysis of factor endowments can suggest the commodities for which a country has a comparative advantage. This theory has been criticized, but remains valid when expressed in terms of several qualities of production factors. The Heckscher-Ohlin theory and those of their predecessors focussed particularly on production factors as determinants of trade, while Burenstam-Linder's theory focusses on demand patterns shaped by income, and on familiarity with demand.

This thesis, which deals with trade in kraft liner, aims at determining the respective influences on trade of (1) factors of production (raw material, labor, capital, economies of scale), which are usually taken as determinants of trade, and (2) familiarity with foreign demand through a marketing organization. From this information will be built two forecasting models integrating part of the results of the investigation.

As full determination of comparative advantage in kraft liner production remains beyond the scope of this study, an indirect approach will be taken to study the influences of production factors on trade in kraft liner. The presumption of comparative advantage suggested by the Heckscher-Ohlin theory will be complemented by a study of competitive advantage of certain regions and countries in supplying the E.E.C., the competitive advantage being expressed in terms of margin (total revenue minus total costs including transportation cost to the E.E.C.). The competitive advantage is calculated because it is a way of taking into account all production factors.

The results of the study of competitive advantage are examined to see if in fact they fully explain past and present directions of trade. An explanation of discrepancies is attempted in Chapter IV through the marketing organization of U.S. kraft liner exporters.

European markets will be supplied, however, only if there is effective demand, and if potential exporters are aware of it.

III. POTENTIAL DEMAND FOR KRAFT LINERBOARD IN THE E.E.C. COUNTRIES.

Introduction

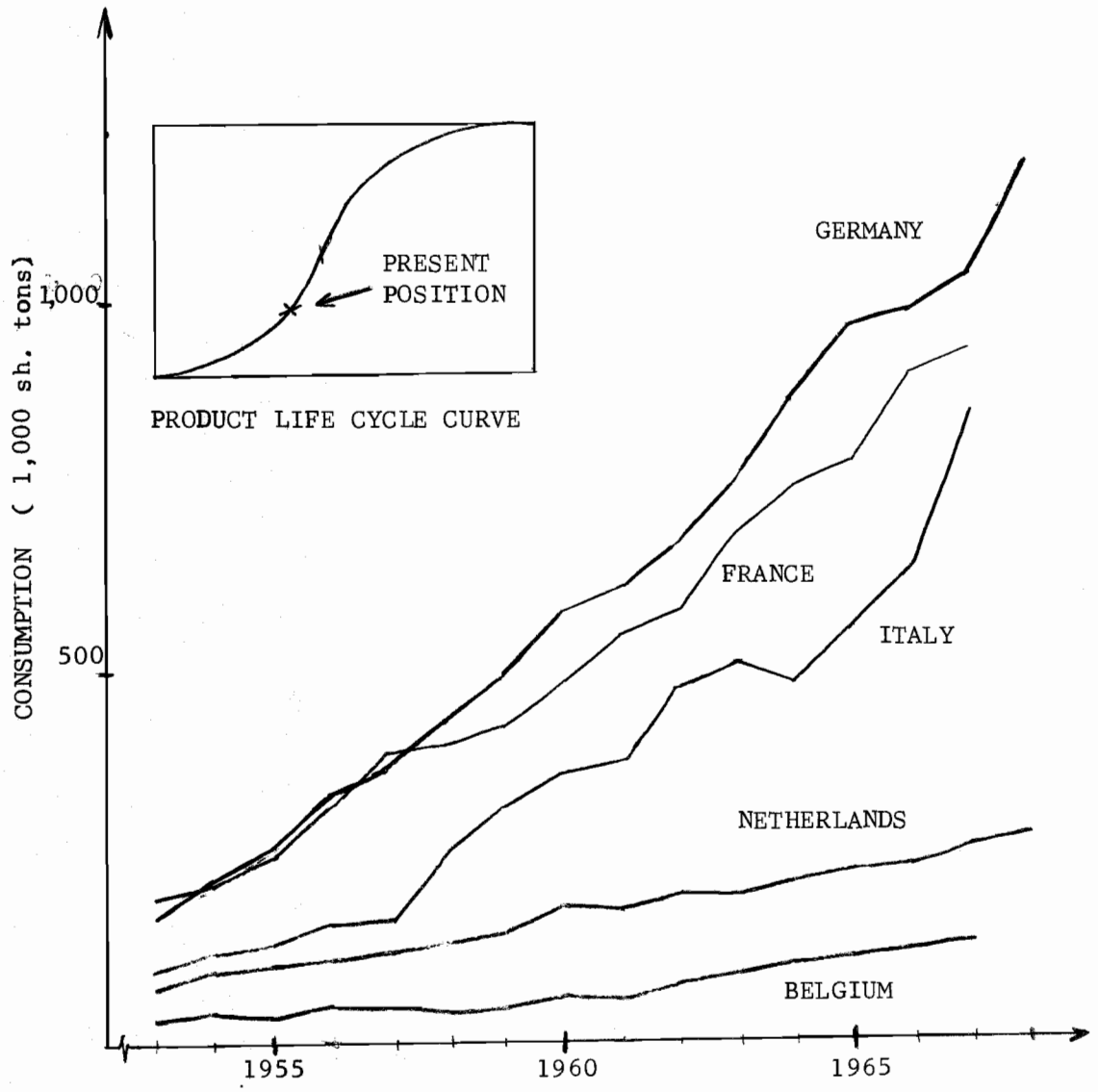
In the preceding chapter awareness of foreign demand as a prerequisite for export was mentioned. In this chapter potential demand for kraft liner in the E.E.C. countries is examined. Kraft linerboard is an industrial commodity used for the manufacture of corrugated and solid fibreboard and for other special uses. Potential demand for it thus derives from the finished product made from it and from which the potential demand for kraft linerboard can be deduced. The study begins, therefore, with an analysis of demand for corrugated board, which is the major outlet (about 90 percent) for kraft linerboard in the E.E.C.

Demand for Corrugated Board in the E.E.C. Countries

Evolution of Past Demand

Figure 1 shows past consumption of corrugated in the E.E.C. It suggests the question: will the growth of demand continue to be as large in the future?

Indications of the evolution of demand for corrugated board can be obtained by several methods. The following will be used: (1) location of present demand on the product life cycle curve, (2) comparison between consumption of corrugated in Europe and in the United States, and (3) regression of corrugated board consumption per capita on GNP per capita. An analysis of competitive products and new uses for corrugated board will also be presented.



Source: Fédération des syndicats de producteurs de papiers et cartons français (1968)

Figure 1. Consumption of corrugated board in the E.E.C. countries.

Location of Present Demand on the Product Life Cycle Curve

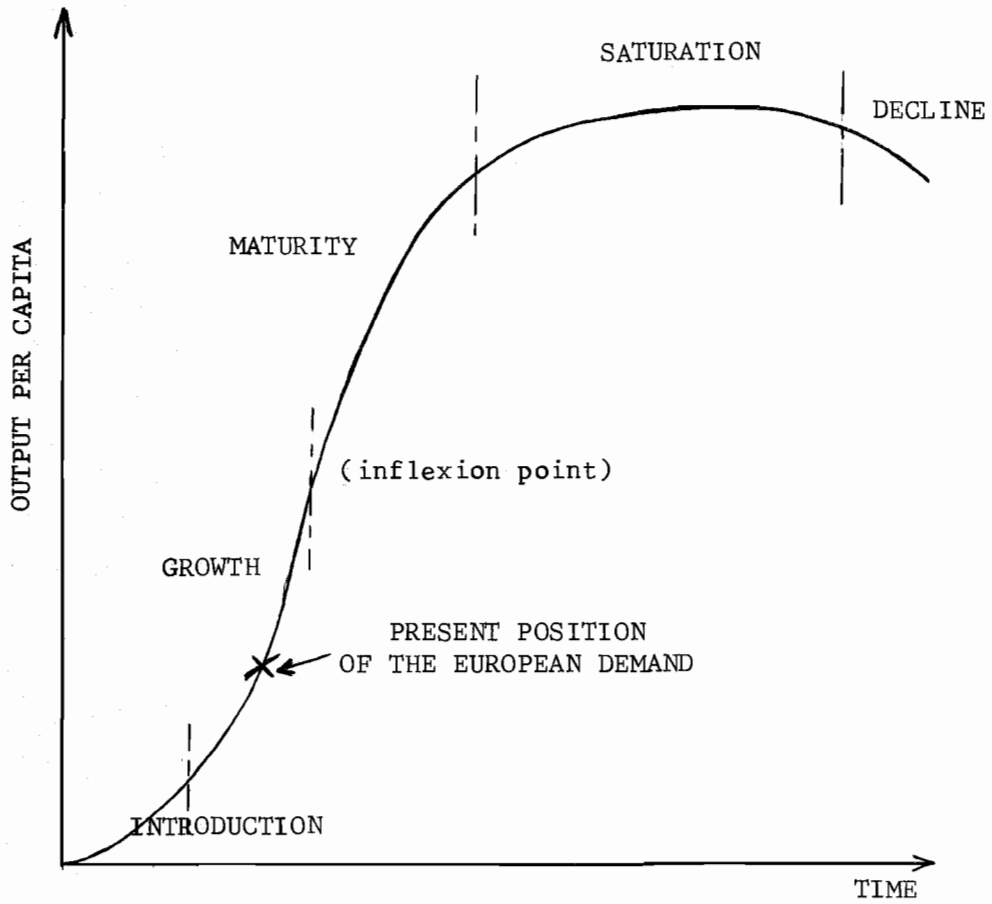
Lifetime sales of many products reveal a typical pattern of development known as the product life cycle. The curve is usually bell shaped. The first part is "S" shaped with phases of introduction, growth, maturity and saturation, as shown in Figure 2. The phases of growth and maturity are separated by an inflexion point.

The present position of consumption is located in relation to the inflexion point to find out if consumption of corrugated will show an increasing or decreasing rate of growth. By comparing an ideal product life cycle curve with the consumption curve for each E.E.C. country (Figure 1), and by calculating the second derivative, it appears that the inflexion point has not yet been reached. This suggests that the E.E.C. corrugated board industry is still in its growth phase, with the very high rate of increase per year at present likely to continue in coming years if corrugated follows a typical product life cycle.

The next question is how long the phase of growth will last. An indication can be obtained by comparing past U.S. consumption of corrugated with present consumption in the E.E.C. This assumes that the U.S. consumption level of corrugated precedes that of the E.E.C. countries.

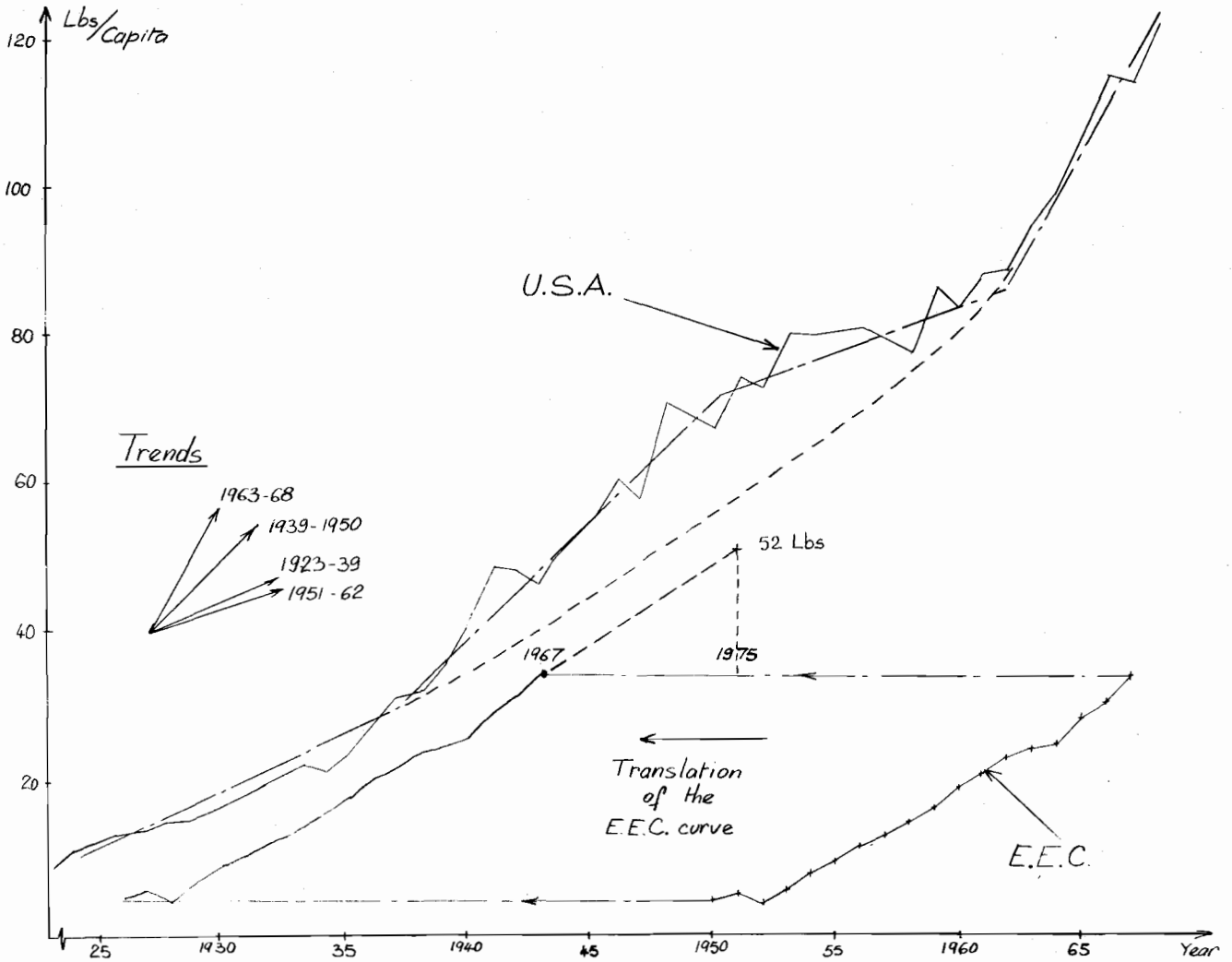
Evolution of Consumption of Corrugated in the United States

Figure 3 shows per capita consumption in the United States from 1925 to 1968. Four trends can be distinguished: 1923 to 1938, 1939 to 1950, 1951 to 1962 and 1963 to 1968.



Source: Kotler, 1967, p.291.

Figure 2. Comparison of the European consumption curve with the ideal product life cycle curve.



Source: Federation des syndicats de fabricants de papiers et cartons francais

Figure 3. Per Capita Consumption of Corrugated board in the U.S.A. and per Capita Consumption in the E.E.C. countries

It is difficult to recognize from this curve at which phase in the life cycle present U.S. consumption is, since the curve has an inflexion point for the year 1948, and then presents a new phase of growth from 1963 to 1968. However, as will be shown after elimination of exceptional effects in the U.S. economy, U.S. consumption of corrugated is still in the phase of growth.

The trend from 1939 to 1950 can be explained by the high economic activity of the war period, while the 1951 to 1962 period corresponds to the relatively low rate of economic growth of the 1950's. The trend after 1962 is in accordance with the present rate of growth. These two trends, 1939 to 1950 and 1951 to 1962, representing phases of acceleration and deceleration in consumption of corrugated, can be eliminated and replace by a curve joining the points of consumption for the years 1939 and 1963 (Figure 3). Since this new consumption curve does not have an inflexion point, consumption of corrugated in the United States in 1968 is still in its growth phase.

Figure 3 also presents per capita consumption of corrugated in the E.E.C. If by translation the European consumption curve is brought close to the U.S. consumption curve, their similarities can be recognized. There is a delay of 28 years in European consumption when compared to the U.S. trend. The United States reached the present level of consumption in Europe in 1939.

Since the two curves have so far been parallel, the European curve might be expected to follow the trend of U.S. consumption, from which the main fluctuations characteristic of the U.S. economy have been removed. This would occur, however, only if it is assumed that

the economic conditions and the competitive position of corrugated with regard to substitutes in the E.E.C. are identical with those in the United States after 1939. This assumption is now examined.

GNP per capita in the E.E.C. increased by 1160 dollars (1967 constant dollars) from 1950 to 1968, as compared to 1222 dollars in the United States from 1939 to 1956, showing that the average rate of economic growth is nearly identical for these periods. Therefore, if the E.E.C.'s GNP per capita continues increasing at the same rate as it did from 1950 to 1968[2], this increase will equal the average increase from 1939 to 1956 in the United States.

Concerning new uses, the E.E.C. has prospects for some, such as the packing of liquid and fruit, which were not in existence 30 years ago in the United States. Besides this, substitutes are not expected to affect the consumption of corrugated, as will be seen later. Therefore, considering the similarity of GNP increases over the said periods and the development of new outlets, we may presume that corrugated in the E.E.C. will have a phase of growth represented by a curve even steeper than that of the United States.

If the U.S. trend is applied to the E.E.C. (Figure 3), consumption would reach 52 pounds per capita in 1975. If the growth phase curve of the E.E.C. becomes steeper than that of the United States, consumption of corrugated in the E.E.C. should exceed 52 pounds per capita by 1975. This information will be used in the next section in

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[2]One of the objectives of the E.E.C. is to maintain the same rate of growth as in recent years.

choosing a regression model to give a more precise projection of corrugated consumption for 1975 in the E.E.C.

Regression of the Consumption Per Capita on GNP Per Capita

In order to project the consumption of corrugated until 1975, it is necessary to estimate future economic growth expressed in terms of GNP per capita.

Estimates of Future Economic Development

These projections of future economic development in the E.E.C. countries have been made only for the purpose of providing one of the necessary working tools to assess the future demand of corrugated board. They do not pretend to give an accurate picture of the level of national output in the next ten years.

The F.A.O. (1963) has made a projection for the year 1975 from time series for the period 1948 to 1959. Two types of relationships (between GNP and time) were used: a logarithmic equation ($\log G = a \log T + b$), and an equation ($G = aT + b$). The goodness of fit between the data and the logarithmic curve was compared and a better fit was obtained by assuming an arithmetical relationship. Data from 1959 to 1968 can be introduced into the original regression in order to obtain better estimates.

Table 1 gives the coefficient of determination for a logarithmic and an arithmetical relationship. Again, in spite of change in the time series, the arithmetical relationship gives the best fit. The projection of GNP per capita for 1975 is given in Table 1. The

Table 1. Coefficients of determination of time with GNP per capita regression assuming arithmetical and logarithmic relationships, and projection of GNP per capita for 1975 for the E.E.C.

Country	Logarithmic	Arithmetical	GNP Per Capita, 1968	GNP Per Capita, 1975[a] Equation $Y = aX + b$
	R^2	R^2	1967 dollars	1967 dollars
Belgium	0.779	0.952	2107	2381
France	0.836	0.979	2399	2781
Germany	0.955	0.991	2154	2677
Italy	0.806	0.989	1358	1605
Netherlands	0.866	0.977	1877	2138

[a]Calculations based on time series 1950 to 1968 (Agency for International Development, 1969).

projections indicate a greater economic growth by 1975 than the F.A.O. study made before 1963, as the following tabulation shows:

Index GNP, 1975, F.A.O.	215
Present study	234

1955 = 100

Regression of Consumption Per Capita on GNP Per Capita

Simple regression of consumption on GNP per capita was found preferable to multiple regression using both GNP per capita and industrial production, because the introduction of the second variable was insignificant at the 5 percent level.

The problem faced is the determination of an equation best describing the form of the relationship between dependent and independent variables. According to Dwight Hair (1967), consumption and income have shown a typical pattern. This curve is approximately "S" shaped, but the mathematical equation for the curve is complex. However, it can be broken into three segments whose general forms can be described by the simpler equations $\log Y = a + b \log X$, $Y = a + bX$, and $Y = a + b \log X$ (Figure 4).

As consumption in the E.E.C. is at the beginning of its phase of growth, the two possible equation models are $\log Y = a + b \log X$ and $Y = a + bX$. The results of the regression are given in Table 2. It appears that the two types of relationships describe equally well the two trends. Analysis of the coefficients of determination and of the residuals shows that for Germany, Italy and Belgium the trends are best explained by the relationship $\log Y = a + b \log X$. Only for France

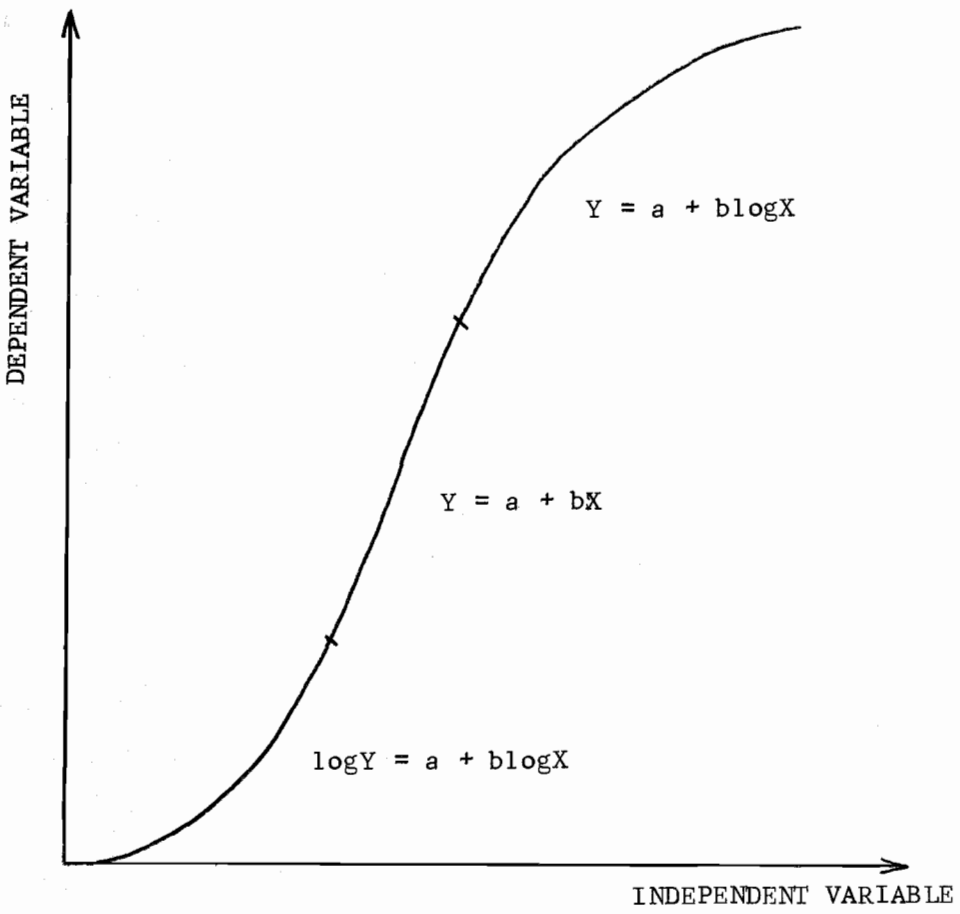


Figure 4. Equations for projecting demand for paper and board

Table 2. Projections of corrugated consumption in pounds per capita for 1975, assuming two types of relationships, $Y = a + bX$ and $\log Y = a + b \log X$.

Country	Relationship $Y = a + bX$		Relationship $\log Y = a + b \log X$	
	R^2	Projection for 1975	R^2	Projection for 1975
		Pounds Per Capita		Pounds Per Capita
Belgium	0.975	37.0	0.978	46.0
France	0.989	51.7	0.953	65.9
Germany	0.987	52.6	0.993	69.3
Italy	0.958	41.2	0.971	62.3
Netherlands	0.939	54.7	0.904	62.9
E.E.C.	0.991	48.2	0.981	63.5

Source: See Table 1.

and the Netherlands does the relation $Y = a + bX$ seem to fit the historical data better. However, there is no statistical test for rejecting the equation $\log Y = a + b \log X$.

In such a case, other grounds can be used to make a choice. Dwight Hair (1967) indicates that when new markets are being taken over and new uses developed, the equation $\log Y = a + b \log X$ is the best to use. Corrugated board will very likely conquer new markets as will be shown; therefore $\log Y = a + b \log X$ seems to be the best equation.

Moreover, since comparison between the U.S. and E.E.C. consumption (p. 16) revealed that the latter will likely be greater than 52 pounds per capita in 1975, projections given by the equation $Y = a + bX$ are too low (Table 2) and the best equation would be $\log Y = a + b \log X$.

The methods used for projection depended upon the assumption of new outlets. This point is now analysed in greater detail. Examination of competitive products is also necessary.

Competitive Products and New Uses for Corrugated Board

Competitive Products

For several years, consumption of corrugated board has not been influenced by competitive materials, but at present the corrugated board market has a great attraction for other industries looking for new outlets.

One of the materials used to replace corrugated board is kraft paper. Recently wrap-around packaging with kraft paper has been developed. It represents a competitive technique for packaging non-fragile products; however, its use still remains limited.

Another material more competitive with corrugated board is shrink pack, which is taking an increasingly important place in the field of packaging. This new techique consists in overwrapping an assembly of cans or small bottles on a paperboard tray with a tube or sleeve of shrinkable plastic film such as polypropylene, polyethylene, or polyvinyl chloride (P.V.C.) The overwrapped assembly then passes through a thermostatically controlled heat tunnel. Activated by the heat, the film shrinks tightly around the product load, holding the cans securely in place. The use of this material is relatively new, even in the United States, and it is difficult to say what will be its exact role in the future.

It seems that the development of shrink pack will depend on three elements:

Price. A comparative study (How fares the shrink shipper?, 1968) shows that the cost of shipping 24 cans was 6.5 to 7.5 cents for a regular slotted container (175 lbs test kraft, printed in one color), and 7.1 cents for a shrink pack (3.5 cents for P.V.C. film, plus two trays at 1.8 cents each). It appears now that the price of shrink pack can match the price of a regular slotted container. Much, however, depends on the quality of the film.

Regulations. In the United States the railroad's Uniform Classification Committee (U.C.C.) in late 1967 approved shipment of certain canned foods in specified corrugated trays sleeve-wrapped with 1.5 millimeter P.V.C. shrink film, leaving an oval handhold opening through the film at each end. Although shipments under this interim classification are permitted only in carload lots, the film and tray concept

is nevertheless now accepted by both rail and truck carriers (the truckers gave their consent in mid 1966). And if this material proves satisfactory before these interim classifications expire in 1970, shrink pack shippers will be permanently classified.

Machine Construction. System technology for shrink pack has begun to fall into place. Every supplier of polyethylene or P.V.C. shrink pack now has a grade suitable for case wrapping, and many offer equipment which they developed or which was developed in cooperation with an independent equipment supplier. Certainly technology and automation will be important elements for the penetration of shrink pack into packaging. Already automatic lines exist to set up trays, load cans, stack and wrap loaded trays, and shrink the film at about 25 units per minute.

In Europe, as in the United States, the use of shrink pack is still limited. It is difficult to say now what the exact future of shrink pack will be; it remains, however, a potential competitor of corrugated board, particularly for food products prepared in cans or glass containers. But despite this possible substitution by shrink pack, there are promising new outlets for corrugated board.

New Outlets

The U.S. consumption of corrugated board has been shown to be more than three times that of Europe. One of the principal reasons is that packaging in the United States is very sophisticated and plays an important role in the marketing of products. Corrugated board is not only used as an industrial packaging for protection of merchandise

during shipment and storage but also as consumer packaging designed to affect sales acceptance. As more and more emphasis is placed on consumer oriented marketing in the E.E.C., corrugated for consumer packaging will be developed by producing corrugated board in all shapes, with bleached or unbleached surfaces suitable for excellent printing.

In addition to consumer packaging, new industrial markets for corrugated are being developed in the E.E.C.: packing of fruit, vegetables and liquids, and transportation by containers.

Packing of Fruit and Vegetables. In Europe the use of wooden boxes is the usual way of packing these products. With improvement in corrugated boxes with regard to standardization, ventilation of box interiors and resistance, this market could easily be penetrated.

Packing of Liquids. Wooden boxes are widely used for bottled wine, beer, soft drinks, aperitifs and mineral waters. In spite of competition from plastic containers, corrugated boxes can penetrate this market. A study by the French Association of Pulp and Paper Manufacturers (1968) indicates the potential market for packing liquids in France is about 500,000 short tons of corrugated board per year, the present consumption for this purpose being about 50,000 short tons. Projection of such a potential market to all E.E.C. countries suggests a market of 1,500,000 to 2,000,000 tons of corrugated board per year.

Container Transportation. Concerning transport across the Atlantic, about 60 to 70 percent of the traffic could be done with containers. In spite of competition from plastic materials, there are large possibilities here for use as boxes or protective padding inside containers.

Final Estimates

In conclusion, analysis of possible new outlets and competitive material permits an optimistic view of the evolution of corrugated board consumption, and justifies the use of the model, $\log Y = a + b \log X$ for projections. The projections of consumption for each country are presented in Table 3.

Results of the method used for making projections in this study can now be compared with estimates from other sources. One recent forecast of corrugated board consumption has been made by the Federation des Syndicats de Producteurs de Papiers et de Cartons Francais (1968). The estimate given for France only was 1,640,000 tons for 1975. The result of the present study is 1,700,000 tons. The two projections appear to be very close. It is possible, then, to have a certain confidence in the projections of corrugated for the other countries of the E.E.C. They will be used for determination of demand for the primary component of corrugated board: kraft liner.

Potential Demand for Kraft Linerboard

Having now an estimation of the potential demand for the finished product, it is possible to deduce the potential demand of kraft linerboard in 1975 by multiplying the forecasts of corrugated board by the average percentage of kraft liner contained. The other products (solid fibreboard, fiber drums...) will not be taken into consideration because of their relatively small importance compared to corrugated board and also because of lack of data for these products.

Table 3. Projection of total corrugated consumption in the E.E.C. for 1975.

Country	Population[a] 1975	Projection of Per Capita Consumption for 1975	Projection of Total Consumption for 1975
	Million Inhabitants	Pounds Per Capita	Thousand Short Tons
Belgium	10.16	46.0	230
France	51.72	65.9	1700
Germany	60.78	69.3	2110
Italy	56.40	62.3	1760
Netherlands	14.10	62.9	440
Total			6240

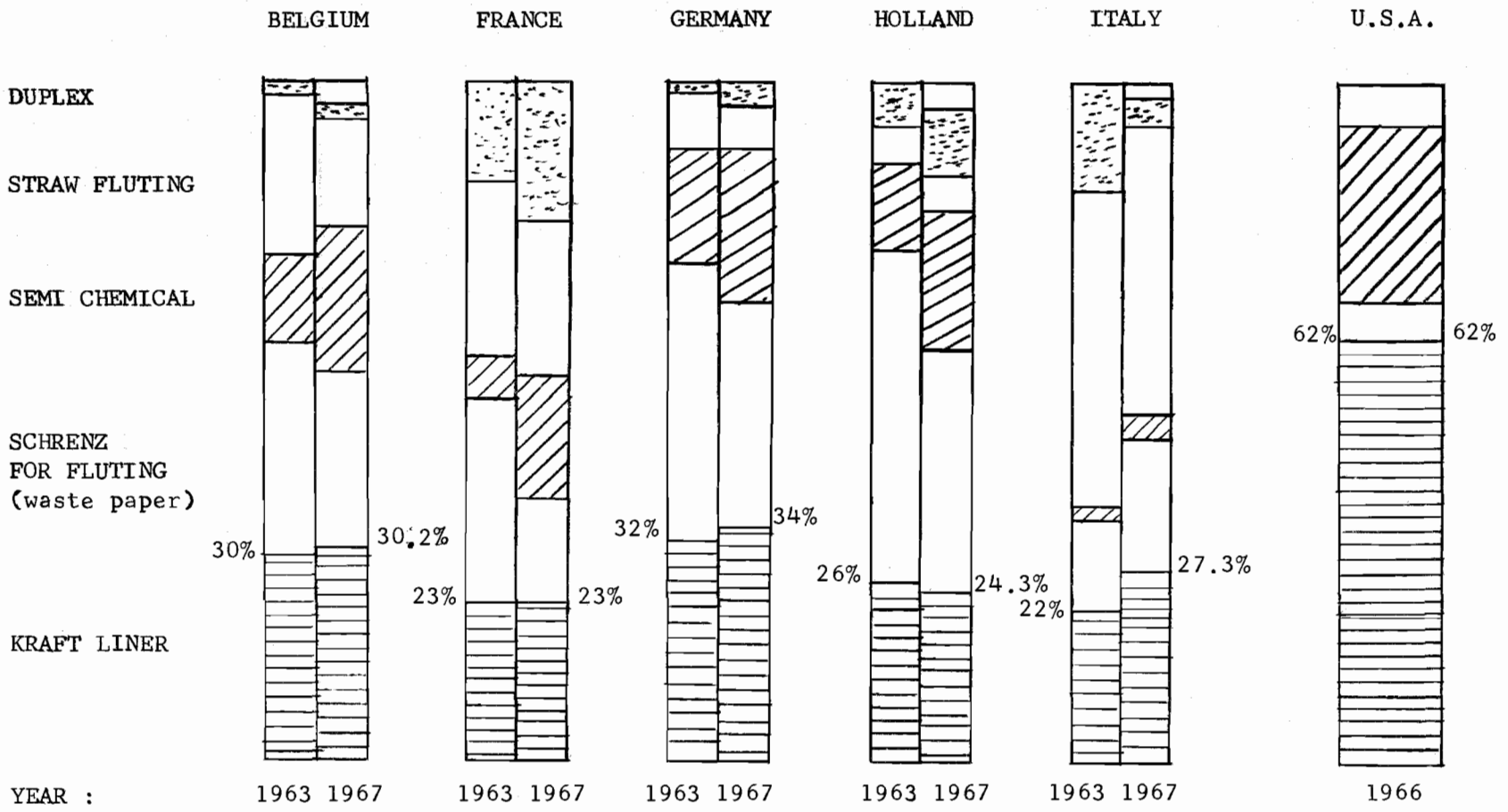
[a] Estimates O.E.C.D. (1966).

Figure 5 shows the average composition of corrugated board for the E.E.C. countries and the United States. The E.E.C. consumes more than 25 percent waste paper in the manufacture of corrugated, compared to 6 percent in the United States. From 1963 to 1967 the percentage of kraft liner has increased for most European countries, with the exception of Holland. Manufacturer-converters in Europe use secondary fibers as much as possible. Research is being done to improve utilization of secondary fiber. However, kraft liner is necessary to give the high quality of shipping containers increasingly demanded. Therefore the rising trend already seen is expected to continue.

Table 4 presents the projected demand for kraft liner in 1975. This will reach 1,763,000 short tons, and its average annual compound rate of increase will be 8.5 percent from 1967 to 1975.

To find the potential for import, it is necessary to know the production figures for kraft liner in the E.E.C., which are presented in Table 5. There is no production of kraft liner in Germany and almost none in Belgium or the Netherlands. The average annual compound rate of increase in production in France is 6 percent, but domestic production supplies only 60 percent of the total consumption. The Italian capacity has increased heavily from 1966 to 1968, but only one third of the demand was met by domestic production in 1966.

According to a review of kraft capacity by the O.E.C.D. (1969, p.18), Italy will increase its capacity for kraft pulp production from 80,000 to 220,000 tons per year by 1970. Only part of this pulp will be used for kraft liner production, which makes accurate projection of kraft liner production difficult.



SOURCE : Fédération des syndicats de producteurs de papier et cartons français (1968) and "Corrugated raw material consumption" (1969)

Figure 5. Relative percentage consumption of raw materials for corrugated board in the E.E.C. and in the U.S.A.

Table 4. Projection of kraft liner consumption in the E.E.C. for 1975.

Country	Projection of Corrugated Consumption for 1975	Kraft Liner Content	Projection of Kraft Liner Consumption for 1975
	Thousand Tons	Percent	Thousand Tons
Belgium	230	30.2	69
France	1700	23.0	391
Germany	2110	34.0	717
Italy	1760	27.3	480
Netherlands	440	24.3	106
Total			1763

Source: See Figures 1 and 5.

Table 5. Kraft liner production in the E.E.C. (1000 short tons).

Year	Belgium	France	Netherlands	Italy	E.E.C.
1963	1.1	105	--	7.7	112
1964	1.1	116	--	13.3	131
1965	0.5	121	--	32.0	154
1966	1.1	125	--	55.0	182
1967	1.1	139	--	58.0	198
1968	1.1	150	10	105.0	268

Source: Letter from the Federation des Syndicats de Producteurs de Papiers et de Cartons Français

What can be concluded, however, is that even with this new capacity, the increase of kraft liner production will not completely meet the high demand. Therefore imports by Italy are expected to increase, but at a much lower rate than in the other countries.

Concerning France, according to the O.E.C.D. review, no increase of pulp production above the general trend is expected. It may be assumed, then, that the past trend of kraft liner production can be used for projection. Therefore, since an increase of 6 percent in production occurred during the last year but demand is increasing by about 8 percent, the percentage of imported kraft liner in the total domestic consumption will increase in coming years.

Conclusion

The E.E.C. countries will not be able to supply completely their own demand for kraft liner. They will rely more and more on foreign supplies of high quality. Imports of kraft liner are expected to follow the consumption of corrugated board in Belgium, Germany and the Netherlands, increasing at an average rate of 8 percent per year.[3]

For France and Italy absolute projections for 1975 are more difficult. Only general trends have been recognized. In France, the import percentage of the total domestic consumption of kraft liner will increase, while in Italy the share of imports (but not the volume) will decrease, reflecting the recent rise in Italian production.

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[3] Assuming that the identified trend will continue in coming years.

IV. COMPETITIVE ADVANTAGE OF POTENTIAL SUPPLYING AREAS OF KRAFT LINER TO THE E.E.C.

Introduction

In the preceding chapter estimates of future demand for kraft liner in the E.E.C. were examined. Now it is necessary to examine the second determinant of trade: the ability of other countries, particularly Scandinavia, to supply members of the E.E.C. with kraft liner in coming years.

As kraft liner is a primary product for which pulpwood accounts for 45 to 65 percent of the total cost, the Heckscher-Ohlin theory is well adapted for predicting trade in kraft liner. According to this theory export should take place from countries which have abundant and cheap forest resources. The analysis of forest resources presented in this chapter will indicate those countries that have potential comparative advantage in kraft liner production. However, only a presumption of comparative advantage can be made because of the complexity of determinants of trade and the unavoidable imprecision of data on forest resources.

For these reasons the immediate cause of trade--competitive advantage at a given point in time, and not the basic one, comparative advantage--will be examined. Indeed, the test whether a country has a comparative advantage with respect to kraft liner is whether the country can offer kraft liner at a price low enough to compete with liner prices from other countries.

The competitive advantage will be expressed in terms of margin, defined as the difference between the C.I.F. price of kraft liner in the E.E.C. and production and transportation costs from other countries. The higher the profit, the greater the competitive advantage of a country and the greater its ability to export.

This chapter, then, presents (1) the step-by-step computation of competitive advantage, in terms of margin, for each supplying region to the E.E.C., (2) the possible influence of the U.S. domestic market on exports, and (3) each exporting region's competitive advantage compared to actual patterns of export trade in the recent past.

However, since competitive advantage is a determinant of trade only if comparative advantage can be presumed, forest resources endowment is analyzed first, followed by a more detailed presentation of the reason for studying the competitive advantage of potential exporting countries of kraft liner.

Forest Resources Endowment

Table 6 presents the distribution of forest resources in the temperate zone. Canada, particularly British Columbia, and the West of the United States appear to be the best endowed, although an aggregate table such as this does not give any details on the nature of the forest.

Forest areas also occur in tropical and subtropical zones. According to the F.A.O.'s 1963 World Forest Inventory, such forests cover 2,430 million hectares, However, there are serious limitations to the usefulness of these vast forest resources. One is the uneven

Table 6. Growing Stock per Hectare per Million Inhabitants in the Temperate Zone.[a]

Region	Volume per Hectare per Million Inhabitants
	m^3/Ha/MM
Europe	
Northern Europe	3.2
E.E.C.	0.4
U.K.	1.0
Rest of Europe	0.4
U.S.A.	
North	0.5
South	0.8
Rocky Mountains	13.6
Pacific Coast	10.6
Canada	
Atlantic	28.0
Central	4.6
Prairie	11.1
British Columbia	101.0
U.S.S.R.	0.5

[a]Based on data taken from F.A.O. (1966,p.48).

distribution of forests with regard to population. Another is the composition of these dominantly broadleaved forests, which contain species of very different qualities and uses to those in temperate zones. This makes exploitation of these forests more difficult and might offset the advantage of these countries to export pulp and paper products.

In the particular case of Europe, an F.A.O. study (1964) has compared supply and demand for all forest products expressed in terms of their equivalent in roundwood. It appears that Europe as a whole will have a deficit of roundwood by 1975. This means that demand will exceed supply, demand and supply being estimated under the assumption that wood will keep its competitive position with respect to substitutes. Table 7 presents these deficits.

The F.A.O. study suggested that North America and the U.S.S.R. would be possible suppliers of the increasing raw material deficit in Europe. In the long run, it is suggested, too, that South America and South Africa may play an important role in reducing this roundwood deficit.

The look at forest resources endowment gave interesting but inconclusive results about the comparative advantage of certain regions of the world in producing forest products. A more detailed study is now necessary to see which countries have a comparative advantage in exporting a particular forest product. In the next section is shown (1) the difficulty in determining which country has a definite comparative advantage in a particular forest product and (2) the reasons why competitive advantage only might be worth examining, even if it is not the basic cause of trade.

Table 7. Surplus (+) or Deficit (-) of Roundwood in Europe in 1975

Countries	Surplus or Deficit of Roundwood
	million cubic meters in wood raw material equivalent
Northern Europe	+ 69.0
E.E.C.	- 88.5
British Isles	- 51.0
Central Europe	+ 4.0
Southern Europe	- 6.5
Eastern Europe	- 19.0
TOTAL	- 95.0[b]
Less residue use	25.0
NET DEFICIT	- 70.0[a]

Source: F.A.O. (1964, p.170)

[a] According to a new F.A.O. study, the deficit of roundwood will be greater (Bourgau,1969).

[b] Does not add because of rounding in preceding computations.

Reasons for Studying the Competitive Advantage of Potential Kraft Liner Exporting Countries

For illustrative purposes consider (Table 8) the production costs of two commodities, kraft liner and newsprint, in two different countries, Sweden and the Southern United States, which should have, according to the preceding section, a comparative advantage in forest products.

Table 8. Production cost per ton of kraft liner and of newsprint in Sweden and the Southern United States.

	Sweden	Southern United States
	U.S. dollars per ton	
Newsprint	101	92
Kraft linerboard	112	95

Source: R.A. Daly, 1969, p. 60 and 66.

It appears the Southern United States have an absolute or competitive advantage in exporting both newsprint and kraft liner, permitting them to become a unique exporter of both commodities. It will now be shown, however, that this is not necessarily so. Transportation costs to a given market are not considered here; their inclusion, however, would not affect the final results.

In Sweden the cost of newsprint is 90 percent that of kraft liner, while in the Southern United States it is 97 percent. It appears, then, that the cost of newsprint is cheaper in terms of kraft liner cost in Sweden than in the Southern United States. Therefore, in spite of the Southern United States' competitive advantage in both newsprint

and kraft liner, it will be more advantageous for Sweden to export newsprint and the Southern United States kraft liner. Relative cost differences (comparative advantage) and not absolute differences (competitive advantage) determine which commodity will be exported.

The above example shows that even among countries with a comparative advantage in forest products, it is possible to distinguish some with a definite comparative advantage in a specific forest product. However, the definite comparative advantage, considering forest products alone, is difficult to determine and changes over time. For these reasons the immediate cause of trade, competitive advantage at a point in time, and not the basic one, comparative advantage, will be examined. Complete determination of comparative advantage necessitates knowledge of production costs of all forest products likely to be exported not only from the United States but from all exporting countries. The amount of information required would make this a very difficult problem. Each firm in a country has, in fact, a different cost according to its productivity, site and age. Furthermore, slight relative differences in costs would have to be estimated (seven percent in the above example).

Comparative advantage also changes over time and can be offset by price increases in raw materials and wages. Changing market prices might cause companies to export other products. Switching exports from one forest product to another, however, is difficult because of the rigidity of a firm's production and marketing structure. Consequently, a firm is not always able to respond immediately to changing market conditions that might offset a relative comparative advantage it has had in a particular forest product.

In the short run, then, examination of absolute or competitive advantage appears best for determining which country is most likely to export a forest product such as kraft liner.

Competitive Advantage of Potential Supplying Areas of Kraft Liner to the E.E.C.

The objective of this part is twofold: first, to study the principal costs involved in the manufacture of kraft liner and to examine their evolution over time, and second, to determine the margin per ton of kraft liner shipped to Europe from each supplying area in order to evaluate the competitive advantage of each. The analysis will examine successively, pulpwood costs, wages, scale economies, total cost of production and transportation to Europe.

Cost of Pulpwood

The cost of pulpwood is of great importance, representing about 45 to 65 percent of the total cost of kraft liner. Presented next is the cost of growing pulpwood, its cost at the millsite, and the evolution of its cost by taking into account stumpage prices and wages.

Cost of Growing Pulpwood

Thorsten Streyffert (1968) compared the cost of growing pulpwood in different regions of the world (Table 9) according to several sites and species. It appears that in Sweden the cost of growing timber is about double that in the rest of the world. To compare with other regions of the world, the cost of growing has been indicated in Chile,

Table 9. Cost of Growing Pulpwood on Sustained Yield Basis.

Region	Species	Site class	Rotation	Cost of Establishment	Cost of Management	Total
		m^3/hectare	years	dollars/m^3	dollars/m^3	dollars/m^3
Chile	Pinus radiata	20.0	15	0.14	0.60	0.74
South Africa	Euc. Salignus	31.5	8	0.11	0.32	0.43
East Africa	Eucalyptus	20.0	10	0.26	0.25	0.51
Southern States	Pinus cariboea	6.8	10	0.27	0.36	0.63
of U.S.A.	Pinus sp.	18.6	20	0.10	0.13	0.23
Sweden	Pine, spruce	4.5	80	0.35	1.10	1.45
	Pine, spruce	4.5	50	0.60	1.20	1.80

Source: Thorsten Streyffert, 1968, p.165

South Africa, East Africa and the Southern United States. In spite of wide fluctuations in prices in these regions costs are still much lower than in Sweden.

Cost of Pulpwood Delivered at the Millsite

It is also necessary to take into account the price of logging and delivery to the mill. These costs vary according to the country and depend greatly on the level of wages. An estimate of the cost of pulpwood delivered at the millsite is given in two studies:

i) The Advisory Committee on Pulp and Paper, F.A.O., Rome, 1964.

ii) R.A. Daly and Company Ltd, 1969.

The F.A.O. study shows the cost of roundwood entering into the manufacture of kraft pulp, while that for kraft liner is shown in the study by R.A. Daly and Company. The costs of roundwood are comparable because of the same quality of wood used for kraft pulp and kraft liner. The results of these two studies appear in Table 10.

Both studies show that Finland and Sweden have a considerably higher cost: cost in the Pacific Northwest is 65 percent that in Finland in the F.A.O. study, and 52 percent of Finland's in R.A. Daly and Company's study. Chile, East Africa and Western Canada (B.C.) have the lowest costs.

Evolution of Pulpwood Cost

Since the figures presented were for one particular year, it is helpful to see how they have evolved over time. This can be done by studying the trend of two major inputs in the manufacture of kraft

Table 10. Pulpwood cost (a) per ton of unbleached sulphate pulp and (b) per ton of linerboard.

Country	(a) Pulpwood cost per ton of unbleached sulphate pulp	
	Cost	Percent
	US dollars	Percentage of cost in Finland (Finland=100)
Finland	56.4	100
Pacific Northwest	36.8	65
East Africa	24.5	43
Chile	24.5	43

Country	(b) Pulpwood cost per ton of linerboard		
	Cost	Percent	
	US dollars	Percentage of cost in Finland (Finland=100)	
Finland	61.1	100	
Sweden	59.2	98	
Southern United States	28.7	48	
Eastern Canada	39.7	65	Average: 52
Western Canada	27.7	45	

Source: (a) Thorsten Streffert, 1968, p.173.
(b) R.A. Daly & Co. Ltd., 1969, p.70.

liner: pulpwood prices and wages. Capital will not be considered. Three time series on the price of raw material are given (Figure 6):

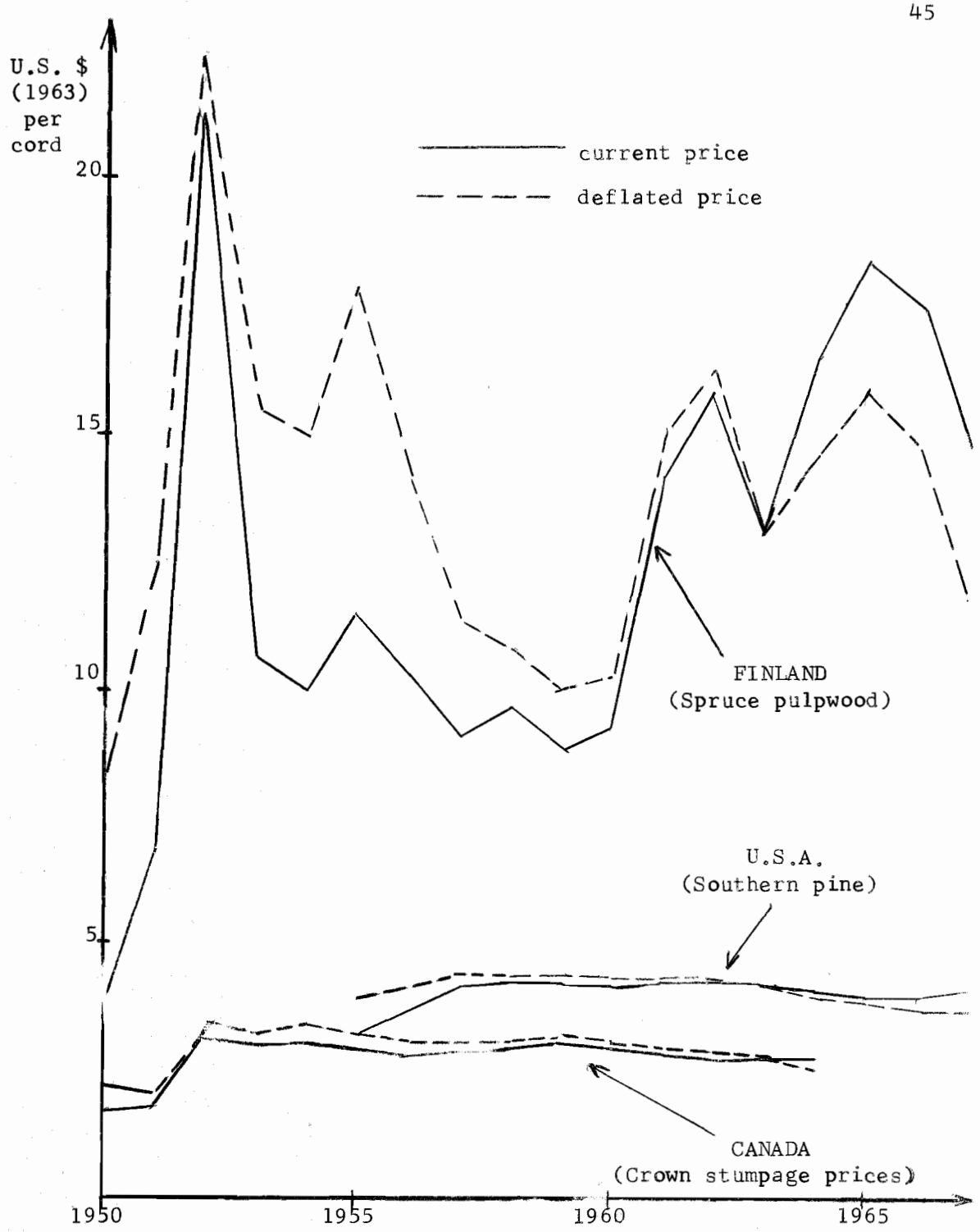
- Stumpage price of southern pine, 1955 to 1967
- Stumpage price of spruce pulpwood in Finland, 1950 to 1967
- Crown stumpage price in Ontario, 1950 to 1964

Actual prices show a slight increase except for Canada. Constant prices (1963 = 100) show a slight decline in both the United States and Canada, meaning that stumpage rates have not kept pace with inflationary influences in the general economy. Finnish prices have a general upward trend, although this trend is not steady. High prices in 1952 were caused by the Korean war.

Wage rates and productivity of labor also affect pulpwood costs. As will be seen in the next section, American wages are about twice those in Scandinavia, but increase less over time.

Productivity depends greatly on the degree of mechanization, which has been very important in all regions due to rising wages in the forests. However, "mechanization will be in future always greater in Canada and the Soviet Union, which afford better conditions for mechanization than the forests in the old settled countries of Northern Europe" (Thorsten Streyffert, 1968, p. 209).

There remains another problem to be elucidated before trying to see what the trend of different prices of pulpwood will be in the future: does the price of pulpwood reflect its cost of production? This difficult question will not be treated in detail here; but the main points need to be raised because of their economic importance.



Source: Hair, Dwight, 1969. Thorsten Streyffert, 1968, p.138. Folia Forestalia, 1968, p.68.

Figure 6 : Deflated prices of pulpwood in U.S. dollars per cord in Finland, Canada and in the Southern United States.

In the first place, the cost of harvesting pulpwood and delivering it to a mill must be recovered in the price at point of delivery. Therefore the price of pulpwood is a limiting factor in its supply. But the price of pulpwood is actually decided by the interplay of forces of supply and demand.

Demand for pulpwood is derived from the pulp and paper industry's need for raw material in competition with other users of small logs; thus the first limitation on pulpwood price is that it cannot exceed what the wood pulp industry can pay.

As for supply, certainly costs of logging and transporting the wood, together with administrative costs, have to be considered. In addition, price of stumpage charged by timber growers (either public or private), the planning of allowable yearly cuts in conjunction with sustained yield management, and investments in silvicultural measures are all important elements affecting the supply of pulpwood, and may have a great impact on its price.

Therefore, natural factor endowment is not the only determinant of the competitive position of a country. The role of governments and the decision of individuals to develop a paper industry can influence greatly the cost of pulpwood. Any influences, public or private, that significantly affect pulpwood costs -- and, hence, competitive advantage -- may materially change trade patterns. These influences have to be kept in mind in order to examine the trend in the cost of pulpwood in the future.

In spite of lower labor costs in Scandinavia, the cost of raw material (in Figure 6 stumpage price in Finland is three times that

in North America) is reaching a point above which the industry cannot afford to go, unless modernization of the industry results in lower manufacturing costs or more investment in silvicultural practices reduces raw material prices. An equilibrium could be reached by a reduction in demand for pulpwood. On the other hand, in North America an equilibrium can be obtained by an increase in pulpwood supply; still more timber can be made available in Canada or by raising prices paid for pulpwood in the Southern United States, where relatively low prices prevail. The result, therefore, is that Scandinavian countries will have a small increase in the price of timber, Canada a relatively small increase because timber can still be supplied at a low price, and the Southern United States a very large increase in the price of pulpwood because of rising wages and a higher demand for pulpwood, as will be seen later.

Such an explanation is in accordance with the figures given in R.A. Daly and Company's study comparing manufacturing costs of linerboard in a 150,000 ton-per-year mill (Table 11). In spite of a ten percent increase in the consumer index from 1965 to 1968 in Canada and the United States, the Southern United States have the largest increase and Sweden the smallest.

In the above discussion, benefits arising through integration of a pulp mill with other forest products plants -- plywood, sawmill, particleboard -- have not been considered. Important economies are realized through such integration, owing to pulp mill use of wood residues. Such associations are now current practice in British Columbia and the Pacific Northwest, and exist also in Northern Europe.

Table 11. Comparison of Pulpwood Costs for Manufacturing one Ton of Linerboard in 1965 and 1968.

Country	1965	1968	Percentage increase
	US dollars		
Finland	61.10	47.20[a]	- 23
Sweden	59.20	61.70	+ 3
Southern United States	28.70	37.00	+ 22
Eastern Canada	39.70	46.20	+ 16
Western Canada	27.70	30.50	+ 10

Source: R.A. Daly & Co. Ltd. of Toronto, 1969, p.70.
[a] reflects reduced stumpage charges and 17% devaluation.

Table 12. Deflated Average Hourly Earnings in the Paper Industry in Selected Countries in 1958 and 1967.

Country	1958	1967	Percentage increase
	US dollars		
Canada	2.02	2.35	15.0
U.S.A.	2.22	2.63	18.4
Sweden	1.23	1.59	29.2
Finland	0.80	1.02	27.5

Source: International Labor Office, 1968.

Wages

In the manufacture of kraft liner, wages count for about 7 to 17 percent of total costs. Table 12 shows that wage increases have been highest in Northern Europe, and this tendency will probably continue. Although comparisons among wages of different countries are difficult, because of differences in methods of computation, American wages are still from two to two and a half times Finnish wages, but less than twice Swedish wages. In modern Scandinavian plants productivity is as great as in North America (R.A. Daly, 1969, p. 63), and so, because of differences in wages, Scandinavian countries have an advantage.

Scale Economies

In the pulp and paper industry substantial scale economies exist. Plant costs are related to capacity in an exponential fashion according to the general formula (F.T. Moore, 1959):

$$\frac{K_1}{K_2} = \left(\frac{S_1}{S_2}\right)^{\frac{2}{3}}$$

K_1 and K_2 are capital costs for plants of different size.

S_1 and S_2 are capacities of these plants.

If investment in a pulp mill of 300 tons per day is 25 million dollars, the cost of a pulp mill of 500 tons per day will be:

$$25 \left(\frac{500}{300}\right)^{\frac{2}{3}} = 35 \text{ million dollars}$$

Besides capital scale economies there are also labor scale economies, of great importance in the pulp and paper industry. Scale economies are demonstrated in Table 13.

Table 13. Estimated average cost of kraft liner manufactured at 90 percent capacity in an integrated mill in Western Canada in 1965.

Mill Size (tons per year)	Average Cost (U.S. dollars per ton)
100,000	86
150,000	78
200,000	74
250,000	72

Source: R.A. Daly and Company, 1969, p. 73.

Economies of scale are a well known fact in the pulp and paper industry. Mills in Canada, the United States and Northern Europe take advantage of them. However, scale economies seem to have a limit because of the problem of pulpwood supply. Only regions with large reserves of timber can take full advantage of them.

Total Cost of Linerboard in Different Regions

Table 14 presents these costs. For the sake of comparison among regions with widely varying manufacturing conditions for wood pulp within each region, it is necessary to base the study on identical mills in the different regions. Pulpwood and manufacturing costs have been taken from R.A. Daly and Company's study. The capacity of the mills has been chosen at 150,000 tons per year, with a further model at 250,000 tons per year in Western Canada, which has a better pulpwood supply.

The costs are low in the case of Finland because of the devaluation of 1967. However, before 1967 the costs were at the same level

Table 14. Net Manufacturing Cost of Linerboard in an Integrated Mill of 150,000 tons per Year, with the Influence of Scale Economies in Western Canada in 1968.

	Finland[a]	Sweden	Southern U.S.	E. Canada	W. Canada	
			U.S. dollars			
Capacity (1,000 tons)	150	150	150	150	150	250
Pulpwood costs	47.20	61.10	37.00	46.20	30.50	30.50
Conversion costs	30.50	35.10	41.60	37.90	37.90	35.20
Total Manufacturing cost	77,70	96.20	78.60	84.10	68.40	65.70
Capital costs	12.80	15.70	15.70	15.70	15.70	12.80
Total cost	90.50	111.90	94.30	99.80	84.10	78.50

[a]Figures after 17 percent devaluation
Source: R.A. Daly & Co. Ltd., 1969, p.72

as those of Sweden. This reflects the possibility of using monetary policy to influence the competitive position of a country and to change directions of trade.

The cost of pulpwood accounted for 64 percent of the total manufacturing cost of linerboard in Sweden, but only 44 percent in Western Canada. This shows the effect of pulpwood costs on the final price of linerboard. Sweden, and Finland before devaluation, had the highest pulpwood costs.

Conversion costs, on the other hand, are lowest in Finland and highest in the Southern United States, while Eastern and Western Canada occupy an intermediate position. For a 250,000-ton mill in Western Canada, the conversion cost is lower than in Sweden.

It has been assumed that the plants in the model were identical and new. However, particularly in Northern Europe, new capacity often is brought about by expanding existing mills. Capacity can thus be increased at about half the cost of a new mill. In this way capital costs are lower and the competitive position of Northern Europe is increased.

Another fact not considered in the model is the possible gain obtained by integrating a pulp mill and a saw mill, which is very common in Northern Europe and in North America.

In Table 14 the cost of linerboard in the Pacific Northwest is not presented. But knowledge of the industry suggests the cost is higher than in Western Canada, and, at least until recently, at the same level or a bit lower than in the Southern United States. The basis of this supposition will be examined later.

Having determined the manufacturing cost in different regions, transportation costs to the E.E.C. should be examined also, because they could be a decisive element in the directions of trade.

Transportation Costs from the Major Supplying Areas to the E.E.C. and to Other Regions

The transportation of kraft liner is expensive because of the very bulky nature of the rolls. Freight costs usually depend on both weight and contract rates. Average freight rates are given in Table 15.

According to this table the Scandinavian countries have a great transportation advantage for supplying the E.E.C. The freight rates from the Pacific Coast to Japan and Peru are also given to see the transportation advantage of the Pacific Northwest in supplying alternative markets to the E.E.C.

The next problem is to investigate whether transportation costs change the competitive position of particular areas to supply the E.E.C.

Margin Per Ton of Kraft Liner Shipped to the E.E.C. from Each Supplying Area

The competitive advantage of a region in supplying the E.E.C. will be estimated by the difference between the C.I.F. price of kraft liner in the E.E.C. and the total costs including transportation. This difference will be defined as the margin.

To simplify the model, the competitive advantage will be measured for shipments to Hamburg, the harbor of the principal importing country of kraft liner. The margin will be calculated as the difference

Table 15. Average Freight Rate from the U.S.A. to European Harbors, to Japan and Peru.

Origin	Destination	Rate
		dollars per sh. ton
U.S. Pacific Coast	Europe	37.42
U.S. Atlantic Coast	Hamburg	28.50
U.S. Atlantic Coast	Italy	30.50
Finland	Hamburg	11.70
U.S. Pacific Coast	Japan	28.80
U.S. Pacific Coast	Peru	47.00

Source: Information obtained by letter from:
- Pacific Coast European Conference, San Francisco.
- North Atlantic Continental Freight Conference, N.Y.
- Finnish Board Mills Association.

between the C.I.F. price in Hamburg and total costs. Table 16 presents margin for different supplying areas. Finland, thanks to devaluation, has the highest margin, then comes Western Canada, due to scale economies; next is Sweden on account of its nearness to the Western European market; then the Southern United States; and finally Eastern Canada.

No figures are given for the Pacific Northwest, but, as mentioned earlier, costs are estimated about equal, or slightly lower than, those in the Southern United States. Therefore the Pacific Northwest would have a competitive disadvantage compared with other possible supplying areas. On the other hand, its natural export market would be the Pacific Rim and Basin.

In conclusion, according to the preceding study of competitive advantage, Northern Europe is expected to be the major exporter to the E.E.C., then British Columbia, next the Southern United States with the Pacific Northwest.

As mentioned earlier, however, the fact that a country has a competitive advantage does not mean that it will export kraft liner to the E.E.C. There may be a better allocation of the firm's or country's resources in exporting other commodities. Export to countries other than the E.E.C. might be more attractive. Even the domestic market might offer better opportunities. Or perhaps margin is not the only factor which motivates exports; expectation of future profit instead of present profit may be one reason; another may be familiarity with one market rather than another.

Table 16. Ocean Freight and Margin per Short Ton, in the Production of Linerboard Sold on the German Market, showing the Influence of Scale Economies in Western Canada in 1968.

	Finland	Sweden	Southern U.S.	E. Canada	W. Canada	
			U.S. dollars			
Capacity (1,000 tons)	150	150	150	150	150	250
Total cost (Table 14)	90.50[a]	111.90	94.30	99.80	84.10	78.50
Inland Freight	5.00[a]	-	-	6.00	-	-
Insurance and Commission	4.00[a]	4.00	5.50	5.50	5.50	5.50
Ocean Freight	11.70[a]	10.00	28.50	28.50	37.40	37.40
MARGIN	33.80[a]	19.10	16.70	5.20	18.00	22.60
Price of kraft linerboard C.I.F. Hamburg	145.00[a]	145.00	145.00	145.00	145.00	145.00

[a]Figures after 17 percent devaluation

The U.S. Domestic Market Versus the E.E.C.

Because of U.S. suppliers' familiarity with the domestic market, it is probable that domestic demand will be satisfied before foreign demand. Therefore it is necessary to consider supply and demand in the U.S. market in order to draw conclusions about U.S. exports. It is also most likely that export will take place from areas able to supply the domestic market as well as part of the foreign market. Therefore the first step is to distinguish regions in the United States that include a supplying area and a consuming area. Allocation of consuming areas to each supplying area will depend on production costs, proximity of markets, and quality of the product.

The second step will be to see if each region determined as above is self-sufficient by analyzing inter-regional trade. Self-sufficiency of a region at a given price will be considered a necessary condition for export.

Allocation of Consuming Areas to Supplying Areas

It has been stated that this allocation depended on production costs, proximity of markets and the quality of the product. This last factor will not be examined because of the rather homogenous character of kraft liner inside the United States.

Cost of Production

Production costs of kraft liner have been studied by Haviland (1968) in two regions of the United States: the South (Georgia) and the Pacific Northwest, two major supplying areas of kraft liner.

In 1964 the cost per ton of kraft liner produced in a 750-ton-per-day mill varies from 82.68 to 85.24 Canadian dollars in Georgia, and from 72.97 to 81.61 Canadian dollars in the Pacific Northwest. The difference in the average cost is about 6.20 U.S. dollars in favor of the Pacific Northwest. The next question is to know whether transportation costs to the major U.S. consuming areas, the Northeastern and Californian markets, will offset the Pacific Northwest advantage.

Transportation Costs Inside the United States

Means of transportation by type of commodity inside the United States are given in the Census of Transportation. In 1963, according to the commodity transportation survey, 15,714,000 tons of paperboard, fiberboard and pulpboard were transported. The distribution by means of transportation was as follows:

Means of Transportation	Percent
Rail	69.8
Motor Carrier	15.9
Private Truck	11.2
Water	3.0
Unknown	0.1
Total	100.0

Transportation cost by rail only was determined, since it is by far the major means of transportation. Computations were based on data compiled by the Interstate Commerce Commission. Costs are given for the main supplying areas -- Mountain Pacific Territory, Southwestern

Territory and Southern Territory -- to the main outlets. The definition of each territory is given in Figure 7.

A measurement of the transportation disadvantage of Pacific Northwest paper mills is obtained if the average freight revenue paid by a Pacific Coast mill to the Official Territory is compared with the average freight revenue paid by Southern mills to the same destination. This is shown in Table 17. The transportation disadvantage of the Pacific Northwest amounts to about 16 dollars per ton if the shipment comes from the Southern Territory[4], 12 dollars per ton if it comes from the Southwestern Territory.

On the other hand, if it is assumed that most of the paperboard traffic in the Mountain Pacific Territory goes south, the Pacific Nortwest has a great advantage for serving the Californian market. The average revenue per ton inside the Mountain Pacific Territory is 10.08 dollars (1966) as compared to 22.65 dollars to ship from the Southwestern Territory to the Mountain Pacific Territory, and about 27.08 dollars to ship from the Southern Territory to the same destination.

By adding production and transportation costs, it appears that the Pacific Northwest has a natural market in California and probably in part of the Mid West. On the other hand, the South has a net advantage in the Northeastern States.

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[4] Difference of the average revenue per ton for shipment from Mountain Pacific Territory to Official Territory and the average revenue for shipment from Southern Territory to Official Territory.

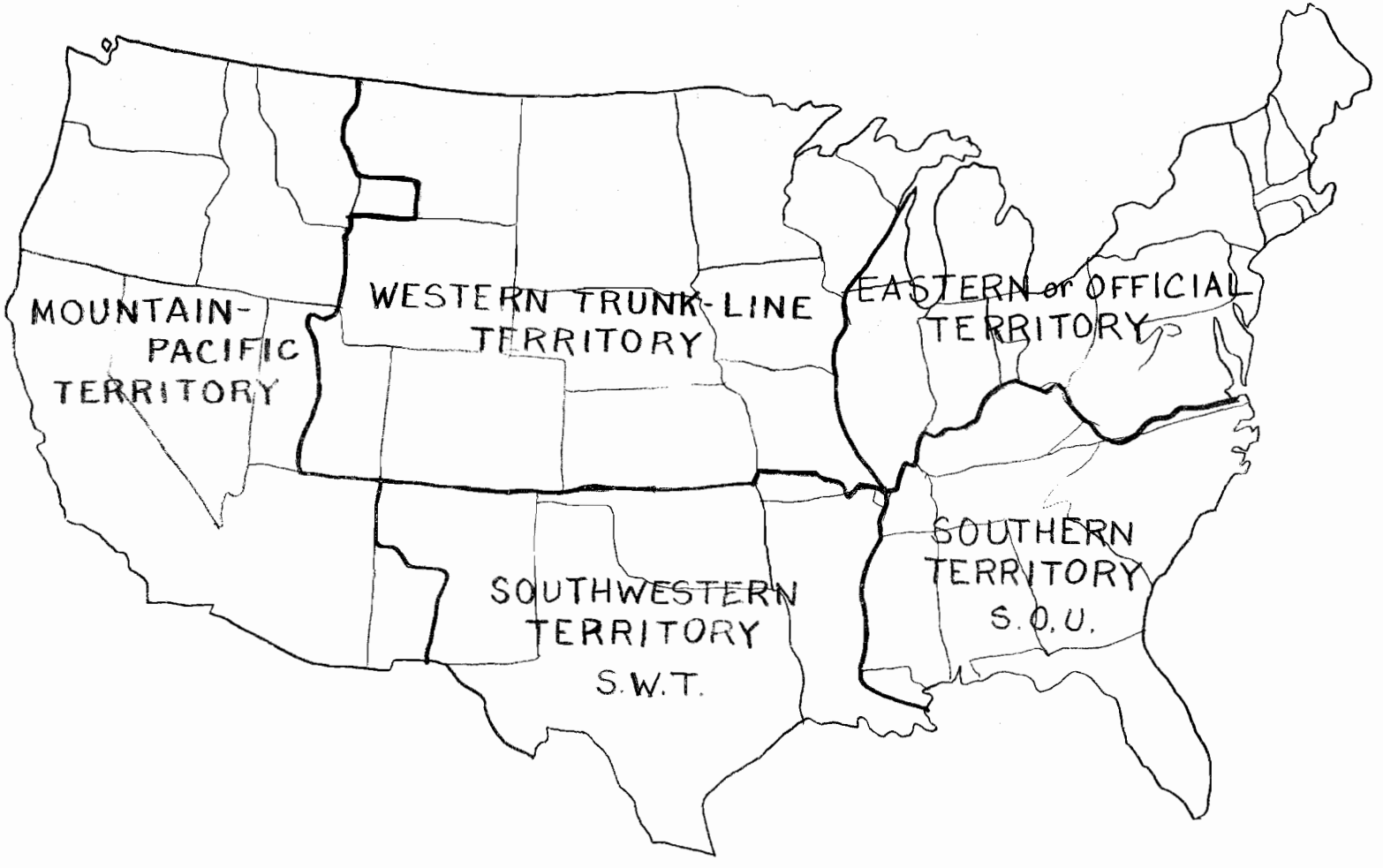


Figure 7. Railroad class rate territories

Table 17. Average Revenue per Ton of Paperboard Shipped in the U.S.A.,[a] 1964 and 1966.[b]

FROM	TO Official Territory		TO Western Trunk Line Territory		TO Mountain Pacific Territory	
Year	1964	1966	1964	1966	1964	1966
			U.S. dollars			
Montain Pacific Territory	27.71	29.08	20.69	20.39	10.07	10.08
Southwestern Territory	15.80	15.29	12.23	12.13	20.04	22.65
Southern Territory	12.05	11.94	14.39	13.92	29.42	27.88

[a]Data for paperboard except construction board.
[b]Revenue is given for two years because of the possible variations due to the sampling method.
Source: Interstate Commerce Commission, Carload Waybill Statistics.

It remains now to be seen whether the Pacific Northwest and the South do in fact supply the consuming areas for which they have a cost advantage. This will be analyzed through past interregional trade.

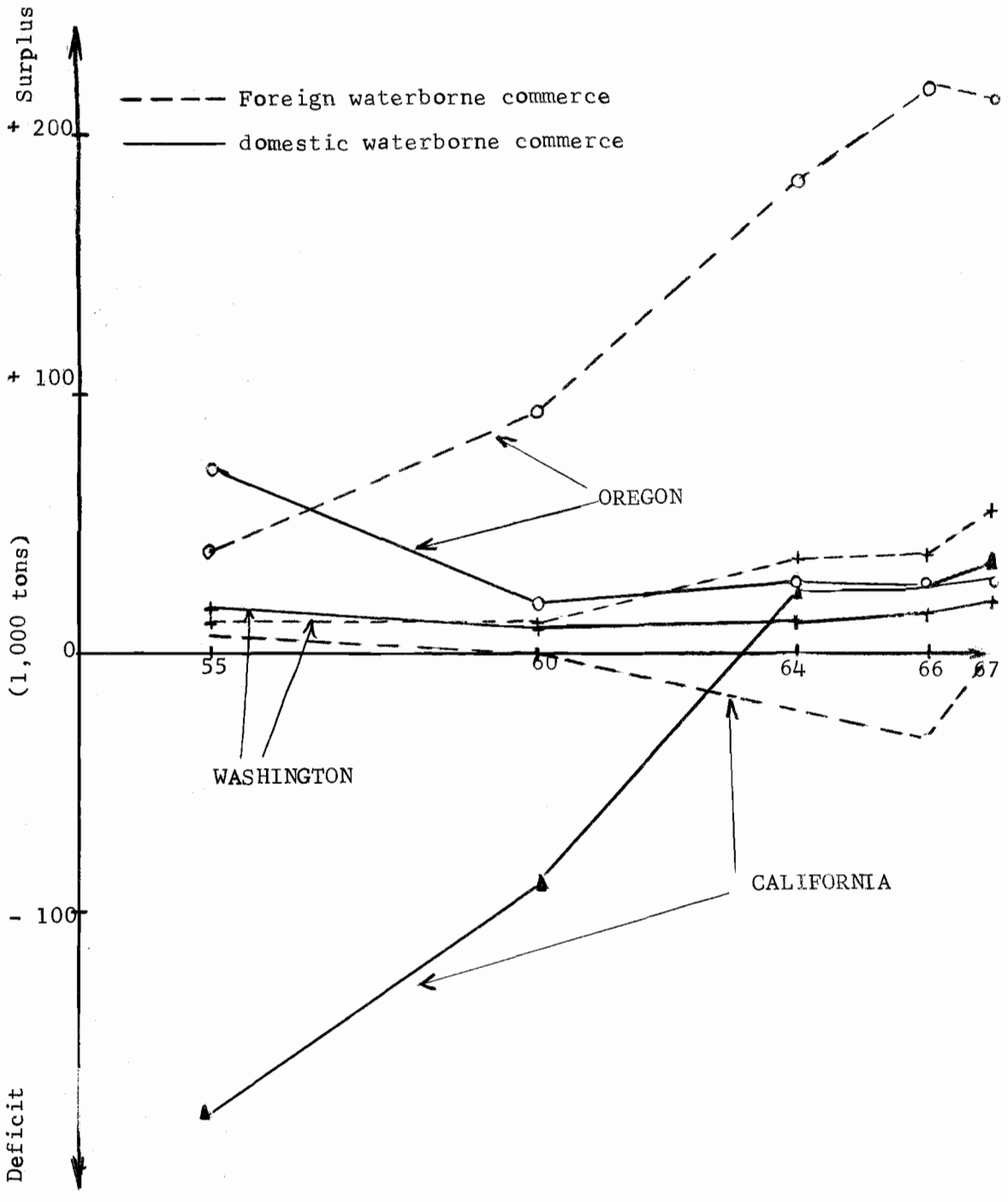
Interregional Trade in the United States

Two studies of trade between regions of the United States have been made: one by J.A. Guthrie and W. Iulo (1963), the other by B. Slatin (1966). The authors concentrated their attention on the Pacific Northwest and on all the Western States. Both studies concluded that the trend in the West will be toward more self-sufficiency. The question is, then, to find out if the West is still a deficit area in kraft liner, or in other categories of paper for which statistics are available.

Statistics on shipments by rail and by ship are available. However, as they do not cover the same categories of paper or paperboard, they will be used over a period of time to illustrate trends.

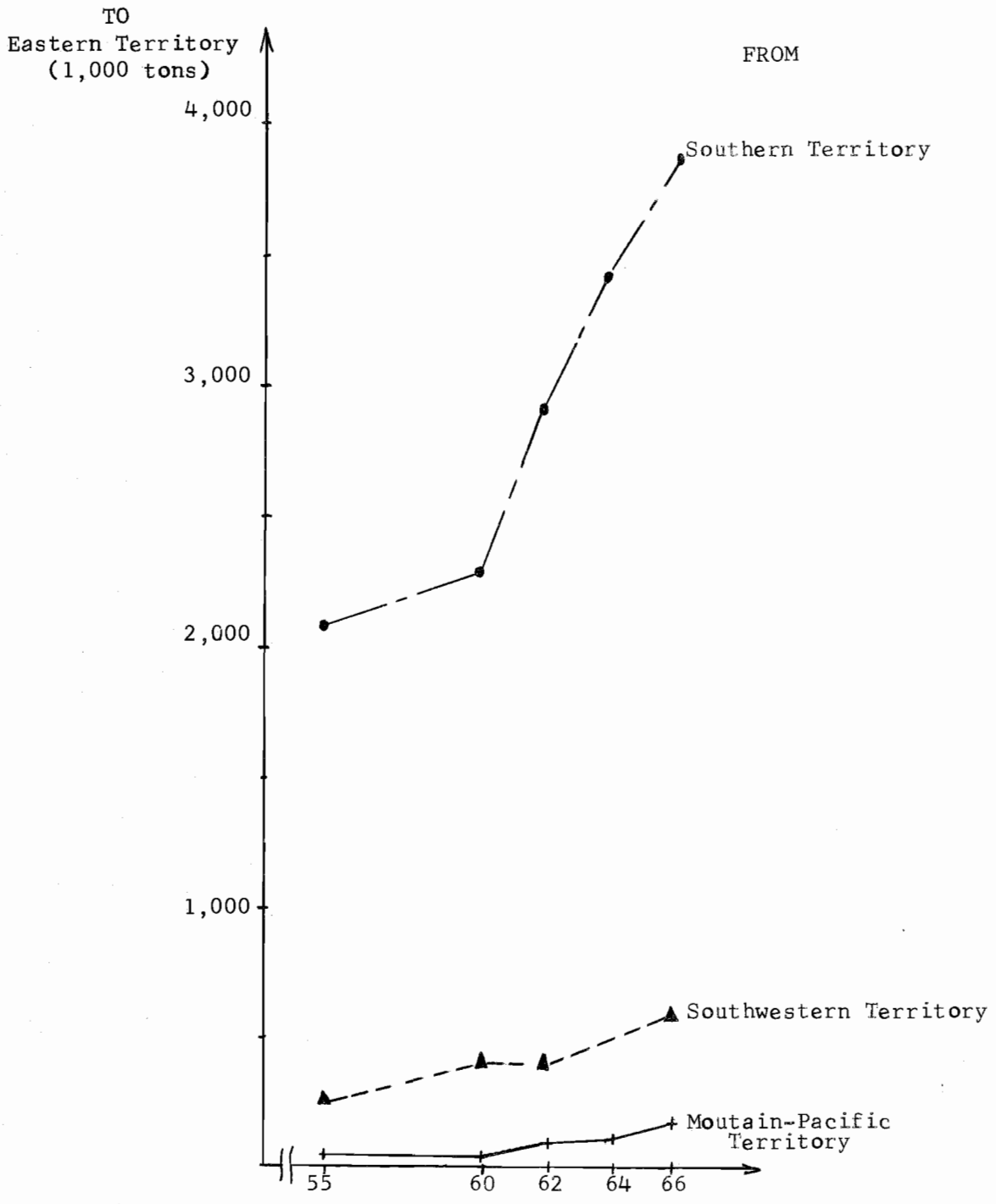
In 1967 the Western States apparently were self-sufficient in all paper and paperboard. Since 1964 California, which was the major deficit area in pulp and paper, has had a surplus in its domestic waterborne commerce (Figure 8). In 1967 the foreign waterborne trade became positive again. Oregon has always had waterborne trade with the Atlantic Coast, but it has been constantly decreasing since 1954.

On the other hand, shipments by rail from the Mountain Pacific Territory to the Eastern Territory have increased slightly (Figure 9), but represent only 1/20 of the shipments which come from the Southern Territory. This shows that, as stated previously, the Eastern



Source: U.S. Army Corps of Engineers, Waterborne Commerce of the U.S.A.

Figure 8. Deficit and surplus of waterborne commerce of paper and paperboard from Washington, Oregon and California distinguishing between foreign and domestic waterborne commerce.



Source: Interstate Commerce Commission, Carload Waybill Statistics.

Figure 9. Paperboard rail distribution to Eastern Territory.

Territories are not a natural market for the Pacific Northwest. It is noticeable, however, that the Western Trunk Line Territory is a more attractive market for the Pacific Northwest (Figure 10). Shipments from the Western Trunk Line have indeed greatly increased since 1960.

Shipments to the Mountain Pacific Territory have been constant since 1955 (Figure 11), while shipments inside this territory have grown considerably, showing that the Mountain Pacific Territory has steadily supplied its own increase in consumption. Only rail and waterborne shipments have been considered. The rest, about 30 percent of total shipments, are by motor carrier or private truck. It can be assumed that these means of transportation are used only for short distance shipments and, consequently, do not greatly influence interregional trade.

To summarize, the Western States are now self-sufficient in paperboard at the prevailing price. The Southern States ship to the Eastern Territory and will continue exporting to the extent that capacity grows at the same rate as consumption.

Now that interregional trade in the United States is known, it is possible to examine exports to the E.E.C. to test if competitive advantage explains fully the international trade of kraft liner.

Test of Estimated Competitive Advantage as a Determinant of Trade

Figure 12 shows exports from the United States. The destinations of these exports have been classified into six groups: the E.E.C. countries, E.F.T.A. countries, Latin America, the Near East including

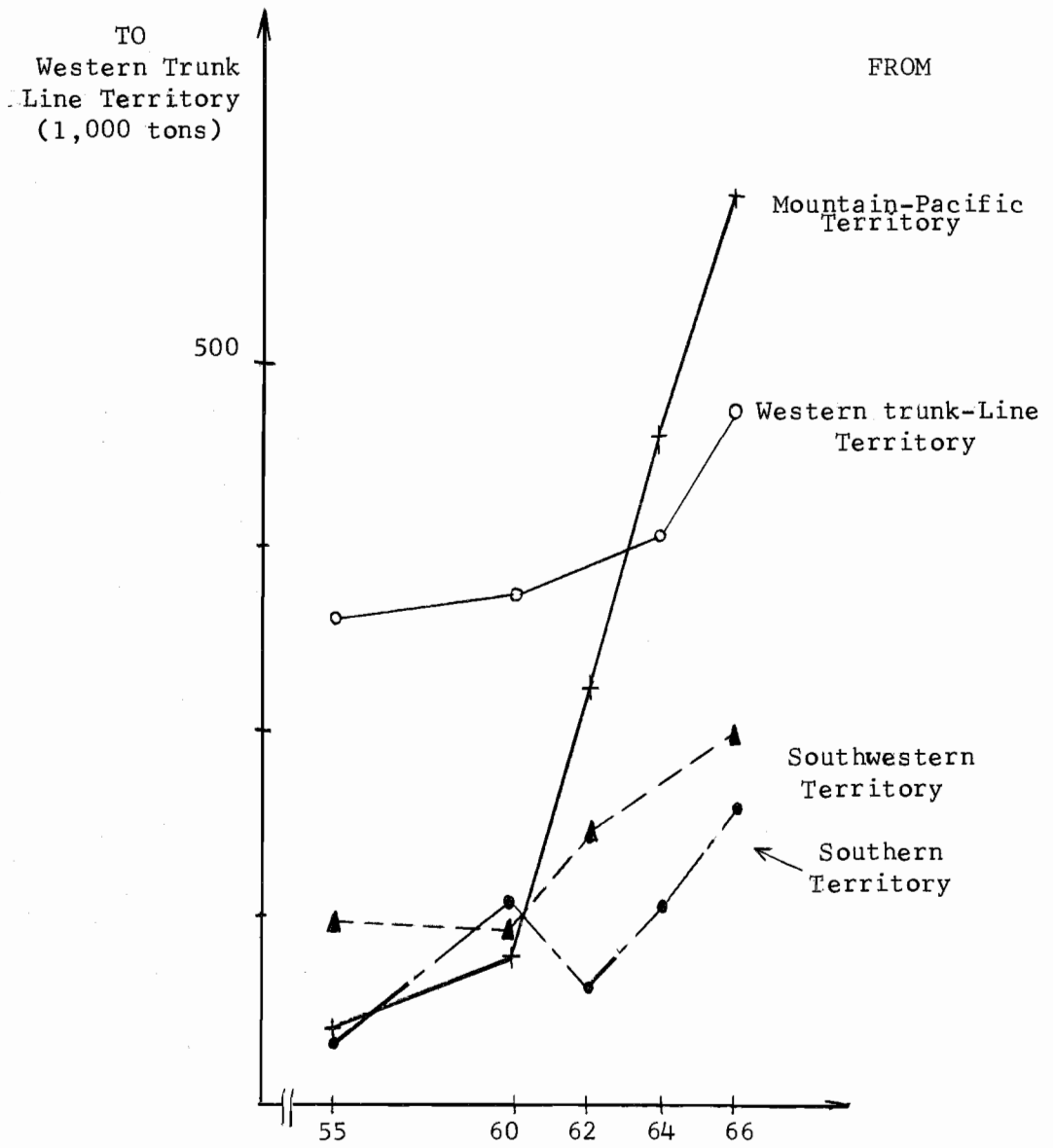


Figure 10. Paperboard rail distribution to Western Trunk-Line Territory.

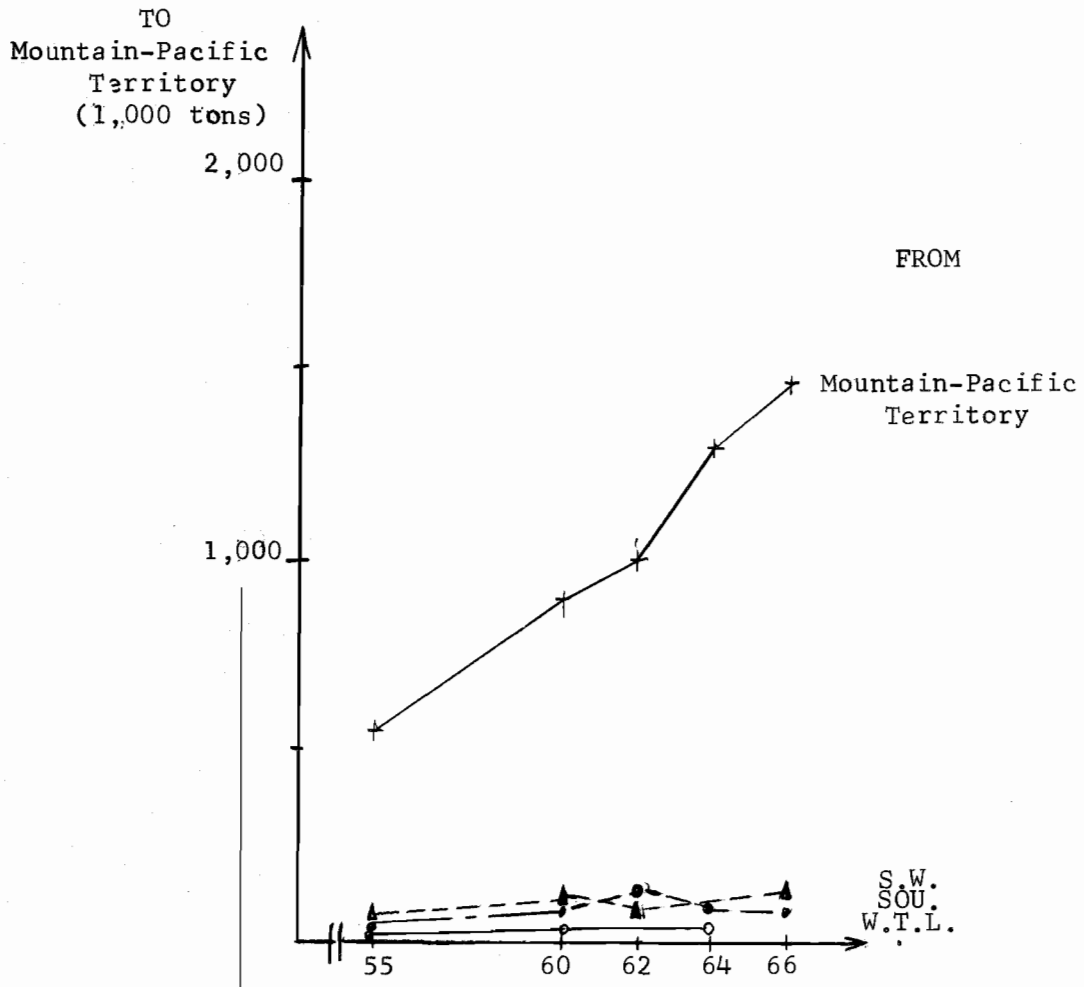
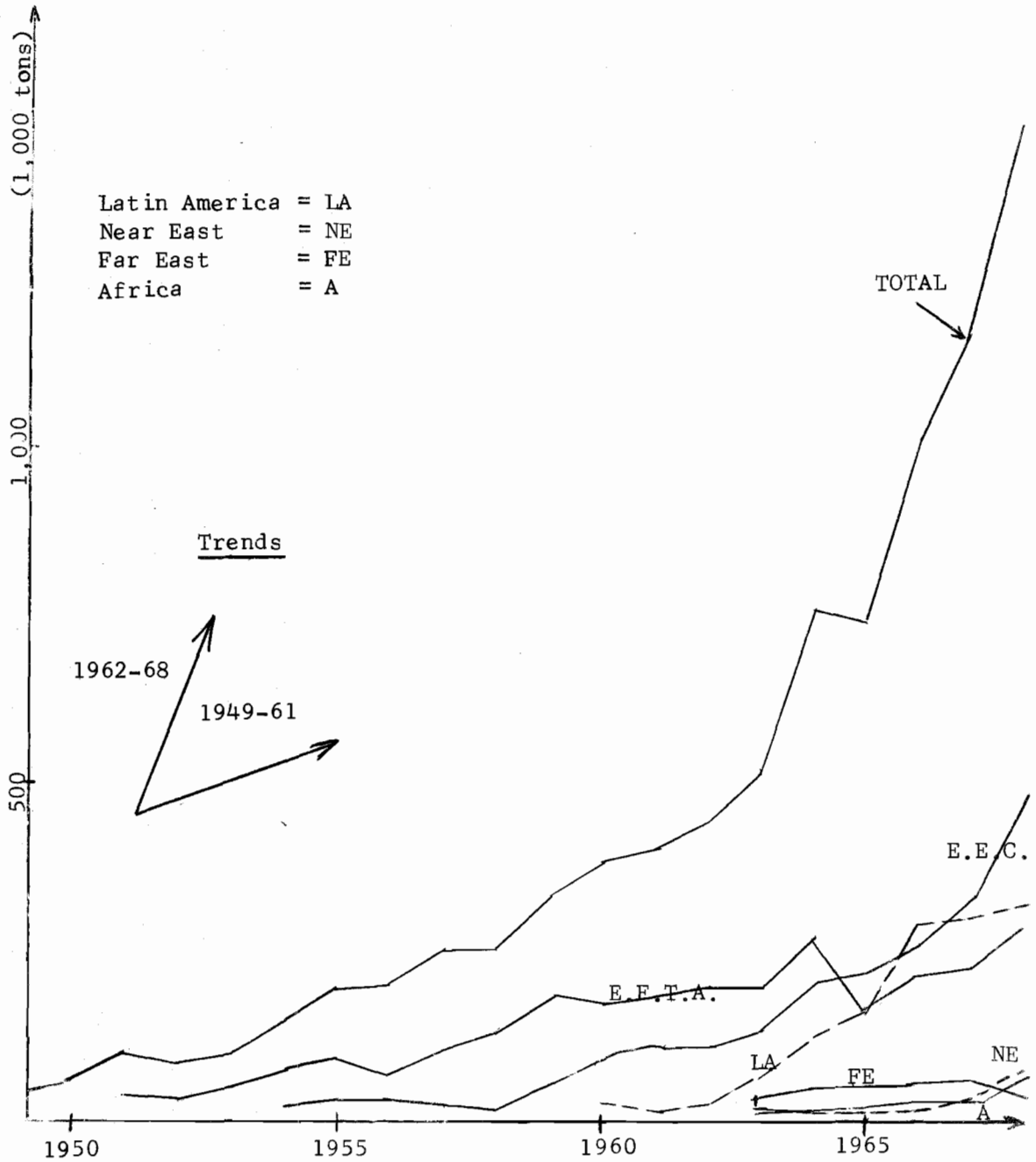


Figure 11. Paperboard rail distribution to Mountain-Pacific Territory.



Source: Bureau of the Census, report FT 410.

Figure 12. Destination of U.S. exports of kraft linerboard.

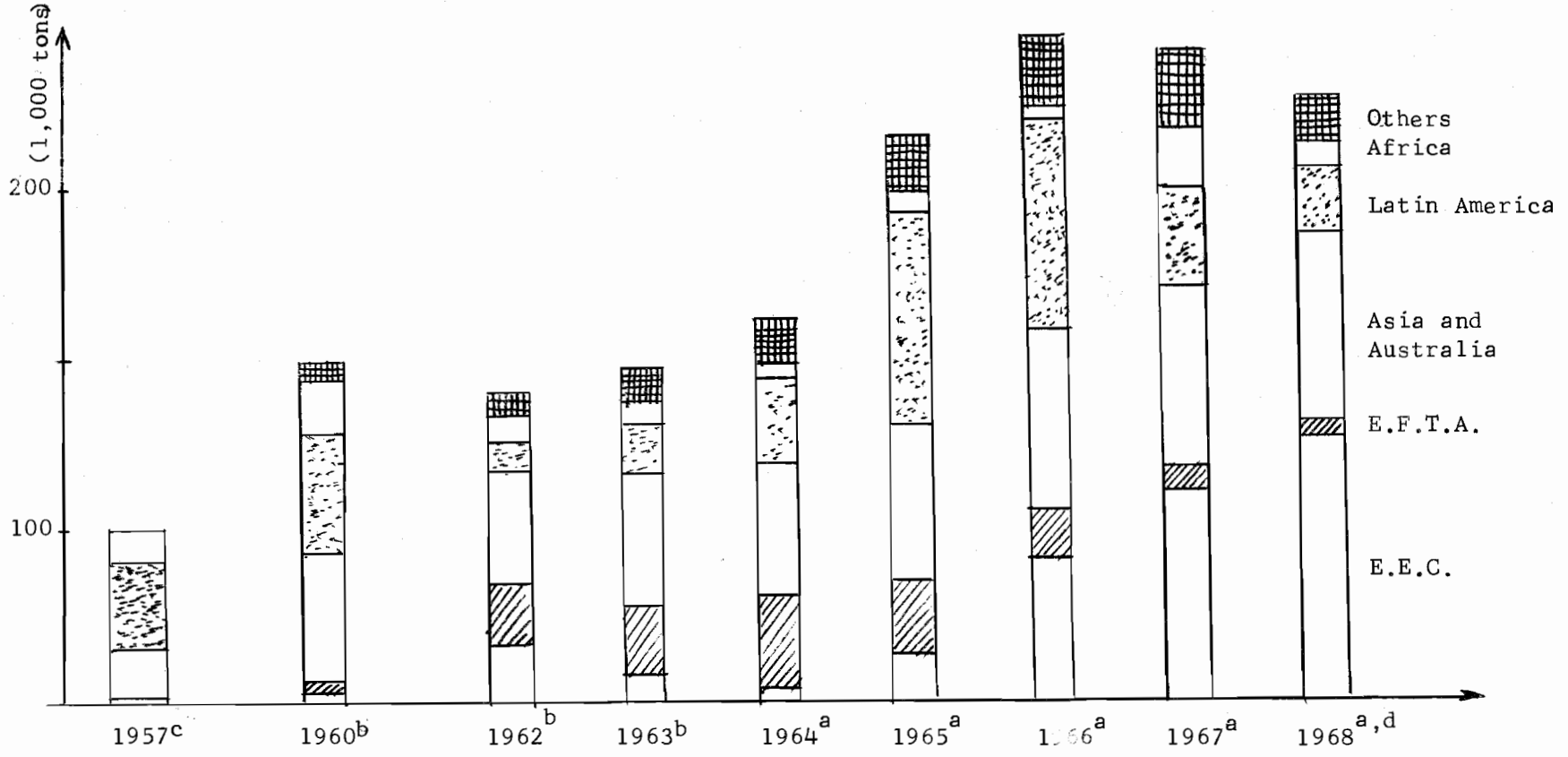
Lebanon, Iraq, Israel etc., the Far East including Japan, Hong Kong, Australia, and finally other countries such as the Eastern European countries.

The E.E.C. countries have become the major export market, replacing the E.F.T.A. countries. Exports to the E.F.T.A. countries decreased in 1965 because of import duties in Great Britain and the reduction of tariffs for commodities coming from the Scandinavian countries. Exports to Latin America have increased, particularly since 1962.

Two phases on the export curve can be distinguished, one from 1949 to 1961, the second from 1962 to 1968 where there is a higher rate of increase. This can be explained by an increasing world demand for paperboard and enactment of the Expansion Act of 1962 which seeks to achieve freer trade.

Share of the Pacific Northwest and the Atlantic Coast in Total U.S. Exports of Kraft Liner to the E.E.C.

Now that the destinations of exports of kraft liner have been examined, it would be interesting to see if the Atlantic Coast, as expected, supplies mostly the European market. Since export figures for a single commodity are available only in the headquarters of each customs district (Department of Commerce Report EA 664), exports from the Atlantic and Gulf Coasts can be obtained by subtracting Oregon and Washington exports from the U.S. total. Figure 13 shows kraft liner exports from Oregon and Washington from 1964 to 1968. Before 1964 only aggregate figures were available. Contrary to expectations, the Pacific Northwest exports to the E.E.C. are increasing, to the



[a]Exports of kraft container board liners, Bureau of the Census, report EA 664.
[b]Export of paper, paperboard and paper products except Newsprint. Schedule S - Category 475. U.S. Bureau of Census, report SA 705.
[c]Waterborne exports of paper, paperboard and paper products, Bureau of the Census, report SA 752.
[d]Include Oregon only- The exports from Oregon include the exports from the North bank of the Columbia.

Figure 13. Destination of the Exports of kraft liner from Oregon and Washington States(1964-68) and destination of the Exports of paper, paperboard and paper products from Oregon and Washington States (1957-63)

detriment of the E.F.T.A. countries and Latin America; whereas exports to Asia and Australia have remained about constant.

Kraft liner exports to the E.E.C. from the Pacific Northwest, in relation to total U.S. exports of kraft liner, increased from 2.4 percent in 1964 to 18 percent in 1967 (Table 18). In 1968 exports from Oregon were 16 percent of total U.S. exports; those from Washington were not yet available.

An explanation of this shift in destinations will be attempted by a study of the marketing of U.S. kraft linerboard in Chapter V.

Destination of Canadian Exports of Kraft Liner

Total exports of kraft liner from Canada are presented in Table 19. They are very low. A longer time series would be necessary to show the trend of Canadian exports. More complete export data to Germany (Table 20), the principal importing country of kraft liner in the E.E.C. , show that after 1963 exports from Canada steadily increase, though remaining relatively low.

More attention must be given to exports from British Columbia, which has a very high competitive advantage in supplying the E.E.C. Unfortunately, only aggregate figures on British Columbia exports are available (Table 21). They show that British Columbia exports very little paper and board (newsprint data are not presented).

On the other hand, the United Kingdom is always the major importing country from British Columbia because of preferential tariffs. However, exports of kraft liner to Germany are increasing, and this

Table 18. Exports of Kraft Liner from the Pacific Northwest to the E.E.C.,Compared to the Total U.S. Exports of Kraft Liner to the same Countries.

Year	Total U.S. export	Exports from Oregon and Washington	Percentage
	short tons		%
1964	199,796	4,960	2.4
1965	226,093	14,627	6.4
1966	269,743	42,177	15.6
1967	343,455	62,572	18.2
1968	492,305	78,833[a]	16.0[a]

[a]Exports from Oregon only
Source: Bureau of the Census, Report FT 410 and Report EA 664.

Table 19. E.E.C. Imports of Kraft Liner.

Year	FROM Northern Europe			sub total	FROM North America		sub total	Total
	Finland	Norway	Sweden		U.S.A.	Canada		
				(1,000 tons)				
1964[a]	233	3	181	417	199	12	211	628
1965[a]	222	6	187	416	267	15	282	698
1968[b]	-	-	-	428	-	-	481	909

[a]Source: International paperboard review. Paperboard packaging (1968).
[b]Source: Letter from the French Association of Pulp and Paper Manufacturers.

Table 20. Imports of Linerboard by Germany.

Year	Imports from Canada	Finland	Norway	Sweden	U.S.A.	Others	Total[a]
			(1,000 short tons)				
1957	-	44	4	7	25	-	81
1961	-	85	5	25	69	1	187
1962	-	100	6	49	76	2	234
1963	-	96	2	76	78	2	256
1964	2	84	2	89	122	1	302
1965	3	82	4	99	154	1	344
1966	20	75	2	103	155	1	359
1967	24	64	3	104	172	1	371
1968	23	55	3	120	253	9	465

[a]May not add because of rounding.
Source: World Review. Pulp and Paper.

Table 21. Export from British Columbia of Paper and Board other than Newsprint.

Destination	1966	1967
	Short tons	
U.S.A.	5,679	3,452
U.K.	66,314	129,146
E.E.C.	5,159	3,783
Others	19,727	14,518
Total	96,897	150,899

Source: Letter from the Economics and Statistics Branch, Department of Industrial Development, Trade and Commerce, Victoria, B.C.

can be interpreted as a first step for Canadian industry toward increasing its exports and diversifying their destination (Fowler, 1969, p. 5).

Exports of Kraft Liner from the Scandinavian Countries

According to Table 19 exports from Scandinavian countries to the E.E.C. are reaching a limit. This is particularly due to a reduction of exports from Finland to the E.E.C. (Tables 19 and 20). Finland now exports much more to the U.S.S.R. and its long term trend is toward specialization and upgrading of production in the forest industries sector, resulting in a decrease in its exports of kraft liner. Sweden on the other hand is increasing its exports regularly, while also upgrading its production in pulp and paper.

In considering both Sweden and Finland, it does not seem that exports of kraft liner from Scandinavia to the E.E.C. will increase greatly, unless a reduction of the E.E.C. common tariff barrier brings about a shift of Scandinavian exports from Great Britain to the E.E.C. countries.

Results

Analysis of the estimated competitive advantage of the different regions suggests that Northern Europe will be the major exporter to the E.E.C., then British Columbia and the Southern United States. Examination of the trend of trade, however, shows the Scandinavian share to have a decreasing role in exports to the E.E.C. It appears also that exports from British Columbia do not correspond with its

competitive advantage, and that contrary to expectation, the Pacific Northwest -- although self-sufficient, but probably not having a competitive advantage -- is increasing its exports to the E.E.C. On the other hand, exports to the E.E.C. from the South are increasing, although the South has a less competitive position than either Scandinavia or British Columbia.

These discrepencies between estimated trade based on competitive advantage and actual trade suggest new hypotheses: (1) the estimation of cost data did not reflect real costs, (2) there exist more attractive markets based on greater profits from exporting to other countries or because of preferential tariffs (the United Kingdom for the Scandinavian countries), (3) other commodities rather than kraft liner represent a better allocation of a firm's or country's resources (newsprint in Canada; paper and board of higher quality in Scandinavia), (4) the study of competitive advantage does not take into account other important factors such as entrepreneurship or marketing organization.

Certainly, it is necessary to investigate all these factors in order to explain more completely actual international trade of kraft liner. It is noteworthy, however, that a study of all these factors -- particularly the study of alternative markets to the E.E.C. and of alternative commodities to kraft liner -- would require the same information necessary to determine comparative advantage. This shows the complexity of international trade in one commodity, which cannot be explained simply by examination of competitive advantage as defined earlier. Under these conditions, it becomes difficult to explain

trade without an extensive model including numerous factors.

One guideline which has not been used so far is the annual announced installation of future linerboard capacity. This information does not give the future direction of trade, but it can indicate the origin of future exports.

In the particular case of the United States, increases in paperboard capacity are available. Announced installation of paperboard capacity between 1968 and 1971 will be in the South (Table 22). This suggests that the comparative advantage of the South is real in supplying both domestic and foreign markets. On the other hand, there is no significant increase of capacity in the Pacific Northwest. Probably the Pacific Northwest, after reaching a level which would make the Western States self-sufficient in paperboard, would lower its rate of growth. In such a case a general reduction in exports from the West could be expected, particularly in exports to Europe. However, more complete information about the increase of capacity in other countries would be necessary to draw accurate conclusions.

Conclusion

As predicted by theory, examination of forest resources endowment has indicated those countries capable of exporting forest products. However, much more information is needed to predict exports of kraft liner from the United States to the E.E.C. Examination of the competitive advantage of different supplying areas, expressed in terms of margin obtained by exporting kraft liner to the E.E.C., has shown that competitive advantage does not explain past directions of trade,

Table 22. Increases in Paperboard Capacity, New Machines Only. 1968-1971 inclusive.

	South	Other regions	Total U.S.A.
		(Annual tons)	
Kraft linerboard	1,456,000	500	1,457,000
Semi-Chemical board	399,000	0	399,000
Bleached kraft board	140,000	0	140,000
Total paperboard	1,995,500	500	1,996,000

Source: B. Slatin, 1968.

particularly from the Pacific Northwest. This suggests that a firm's resources might be better employed by exporting to other markets or by exporting commodities other than kraft liner. Moreover, it is suggested, too, that marketing organizations abroad might have an impact on directions of trade. All of which shows the complexities of attempting to explain patterns of international trade. Another determinant of potential exports is increased pulping capacity within a country in excess of supply-demand conditions. Data show the Southern United States are likely to be the principal supplying area of kraft liner exports in the near future, even in the face of increased prices for pulpwood. Unfortunately, lack of similar information on expected increases in capacity in other countries prevents use of this approach to construct a complete picture of export potential.

V. THE MARKETING OF U.S. KRAFT LINER IN THE E.E.C. COUNTRIES

Introduction

The purpose of this chapter is to determine why the study of competitive advantage in different countries has not fully explained actual trade in kraft liner. Emphasis will be placed now on the marketing efforts developed by U.S. exporters of kraft liner to the E.E.C., particularly to show the importance of differentiation of products and the marketing organization for trade in kraft liner.

Export marketing information has been obtained by a survey of companies known to be involved in exporting this commodity. Through these contacts several factors important to a fuller determination of trade in kraft liner have come to light:

- Product quality
- Channel of distribution
- Promotion
- Transportation
- Tariffs
- Price policy

These factors will be examined successively; then an economic model will be developed in order to show the importance of product differentiation in the trade of kraft liner. First, some details will be given about the method used in the survey and the companies contacted.

The Survey

Method of Survey

As there are 11 companies that export 80 to 85 percent of the total volume of kraft liner, the survey methods were flexible in order to suit individual companies. Data were collected through a combination of methods: personal interview, telephone, mail. Personal interviews were set up in order to explore how the international trade of kraft liner takes place, and to seek hypotheses. Then complementary information was sought to test the hypotheses, either by personal interviews again, or by phone or mailed questionnaires[5].

For each company with an office on the West Coast, the first contact with the export manager was established by telephone. Then, for all the companies exporting kraft liner to the E.E.C. from the Pacific Coast, a personal interview was arranged. For companies exporting from other regions, information on foreign activities was obtained through telephone discussion, and in addition, a questionnaire was sent to the export offices on the East Coast to seek more information about the companies' exports of kraft liner to Europe. Finally, the same questionnaire was sent to the companies that had no office on the West Coast. The questions were put first to an exporter during an interview, in order to test the questionnaire. In addition to exporters, two companies that do not export kraft liner were surveyed. They were chosen because of their similarities to the

[5]A copy of the questionnaire appears in Appendix B.

exporting companies in order to bring out elements discouraging a company from exporting, The similarities taken into account were as follows: the companies were large, integrated, and also specialized in pulp and paper, and one company had a subsidiary abroad. The distribution of interviews, telephone discussions and questionnaires is given in Table 23. In cases where no information was obtained about a company's foreign activities, a particular effort was made to find information in directories, periodicals and reports.

Characteristics of Exporters

The size of firms exporting kraft linerboard ranges from small to very large firms (Table 24). Export participation does not seem to be determined by the size of a company. All companies were integrated firms possessing paper mills and timberland. Moreover, most of them were also manufacturers of other forest products. For two of them, the forest product division was only a small part of the total activity of the firm.

Product Quality

All manufacturers export kraft liner according to European sizes and basic weight[6]. Concerning product quality, five out of seven companies answered that the quality of exported kraft liner was the same as that manufactured for the U.S. market. Two of them, however, manufactured a better quality product with a higher bursting strength.

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[6]U.S.standard for certain basic weights are close to the corresponding European standard; 42# U.S. Standard = 205g is sold in Europe for 200g.

Table 23. Distribution in the Survey of Interviews, Telephone Discussions and Questionnaires.

Method		Number of Firms
Total companies contacted (including two non exporters)		13
Questionnaire[a]		6
mailed	6	
answered	5	
Telephone discussions		4
Personal interviews		3

[a]Three respondents to the questionnaire provided usable information. Two others provided no information: One did not give answers because of lack of time, but provided addresses of exporters from which to get information; the other preferred not to divulge the information requested.

Table 24. Annual Total Sales of the Manufacturers Who Export Kraft Liner.[a]

Total Annual Sales	Number of Firms
Million dollars	
More than 1,000	4
500 - 1,000	2
200 - 499	1
100 - 199	2
0 - 99	2
Total	11

[a]For the year 1968.

One of the two mentioned especially that this type of linerboard was developed to compete with the highest quality board that is manufactured in Northern Europe.

Kraft liner with special treatments -- heavyweight board and wet strength kraft liner -- is only exported by a few companies and this in relatively low quantities compared to total exports. Such types of kraft liner are expected to increase as the types of packaging in Europe become more sophisticated.

In conclusion, all exporters to the E.E.C. have adjusted their production to European demand, requiring in certain cases specialization of their paper machines. This explains the necessity of rather long term commitment between supplier and customer, and also the constant flow of trade between exporting regions of the United States and the E.E.C.

Organization of Overseas Operations

Table 25 presents distribution channels used by U.S. producers of kraft liner exporting to the E.E.C. Six companies have sales offices in Europe, either in England or in several E.E.C. countries. These are complemented by independent foreign agents in other countries. Two use U.S. agents and one sells piggyback, that is, this company (the rider) uses established distribution facilities abroad belonging to another manufacturer (the carrier). One uses its affiliates in Europe as an intermediary.

It is reasonable to assume that the type of sales channel and the size of company might be related, that large integrated companies would

Table 25. Distribution Channels Used by U.S. Producers of Kraft Liner Exporting to the E.E.C.

Type of Distribution Channel	Number of Companies
Sales to U.S. manufacturers with established distribution facilities abroad (piggyback).	1
U.S. based export agents	2
Foreign agents only	0
Combination of foreign agents and sales representatives	6
Affiliates only	1
Total number of companies giving this information[a]	10

[a]Among these 10 companies, five have subsidiaries in Europe.

have foreign sales offices while small companies would export through a U.S. agent. In fact, however, this is not the case. One company having annual sales of more than one billion dollars exports through a U.S. agent, while another company having 60 million dollars in annual sales exports through exclusive selling agents and possesses its own subsidiary for sales of linerboard in one E.E.C. country. Therefore a company's total sales volume does not necessarily reflect the structure of its international organization. On the other hand, the choice of distribution channels is significant in revealing the strength of a company's commitment to a policy of foreign trade.

Six firms oriented to export markets have their own sales offices. At present in each of the E.E.C. countries at least one American company has succeeded in establishing a sales office. At the same time, U.S. firms have established subsidiaries. Among 11 exporters of kraft liner, five have subsidiaries, that are mostly box plants, thus realizing a complete integration from the U.S. forest to the European consumer of linerboard.

The fact that U.S. companies have subsidiaries abroad affects the direction of trade. Indeed, most of these companies ship their kraft liner to these subsidiaries or affiliates. Ties between U.S. paper companies and subsidiaries are reflected by U.S. Department of Commerce statistics on plant and equipment expenditures abroad. Seventeen million dollars were spent in the E.E.C. in 1965, as compared to two million in 1960, and in 1965 sales by foreign manufacturing affiliates of U.S. paper companies were 62 million (B.D.S.A., 1967, p. 7). The President of the American Paper Institute comfirmed the existence of such ties

and their beneficial effects by saying:

> The foreign subsidiaries of American industry as a whole are known to take about 25 percent of all American exports, and we believe the paper industry is fairly close to the norm in this respect (Locke, 1969, p.53)

In conclusion, although the U.S. agent is still used, there is more direct selling, combined, for certain countries, with foreign agents and acquisition of foreign subsidiaries. Such developments seem to be the best way for American firms to become aware of foreign demand and to take advantage of it.

Promotional Activities

As U.S. firms generally sell directly, personal selling is the most important promotional activity, A salesman is the key intermediary between buyer and manufacturer. He is the only person who can give information about price, product quality, and country of origin. It is very important that a climate of confidence exists between buyer and salesman. Therefore, the choice of salesman is particularly important.

Kraft liner is advertized in trade publications. Six of the 11 principal exporters purchase advertizing for the purpose of differentiating their product in the eyes of overseas customers. Moreover, advertizing creates awareness of the name of a company selling a wide line of pulp and paper products and, very often, other forest products as well. Some companies prefer not to advertize, relying instead on the quality of their products and services offered.

As kraft liner is an industrial product, respected leadtimes and quick delivery are appreciated. Most companies in their advertisements indicate ability to deliver quickly. This assumes they have warehouses

in Europe and a regular supply from the United States. This raises the question of transportation between Europe and the United States.

Transportation

In Chapter IV the importance of transportation costs in determining competitive advantage and, consequently, trade, was shown. Reductions in these costs can affect considerably the directions of trade. How this is accomplished is discussed next.

Containerization

Containerization is a future possibility for transport between the United States and Europe that could reduce the handling costs of kraft liner. Shipment by charter is, however, the principal means of transportation at present.

Shipment by Charter

This means of transportation is a way of offsetting transportation disadvantages from the Pacific Coast to Europe. Integrated companies ship cargoes composed of kraft liner and other forest products. Moreover, charter freight rates are reduced by exporting forest products and importing European products, such as cars, on the ship's return journey.

Improvement of Handling Techniques

Several pulp and paper companies are inaugurating new overseas shipping systems. One company ships from the South to Europe in a vessel

specially designed to handle large rolls. Sailing every 30 days, this ship assures a dependable delivery with reduced damage to the rolls. Moreover, regular delivery makes possible a reduction of overseas inventory.

Improved performance will also be accomplished by a system developed by another company. The heart of the new system will be a specially designed 43,000-ton cargo liner with a back-up fleet of 233 identical 400-ton barges. The liner will carry 73 pre-loaded barges that can be hoisted directly into or out of holds at 15 minute intervals by a giant 500-ton crane permanently aboard ship. Plans call for the vessel to carry different pulp and paper products outbound from the Gulf of Mexico and southeastern ports of the United States to the United Kingdom and Europe, returning inbound with general cargo. A 30-day turnaround cycle is expected. The vessel will carry more than 250,000 tons of paper products per year. Its principal advantage will be a substantial reduction in handling costs. Such improvement in the overseas systems can be expected to reduce North America's transportation disadvantage in supplying European markets.

Tariffs

Trade barriers among member countries of the E.E.C. were eliminated in July 1968, but a common external tariff is maintained. The Kennedy Round negotiations held under the General Agreement on Tariffs and Trade in Geneva, that concluded in July 1967, led to substantial tariff cuts phased over a four year period (Table 26).

Table 26. Reductions of tariffs on kraft liner

Applicable From	Ad Valorum Duty Rates
7/1/1967	16.0
7/1/1968	14.4
1/1/1970	13.6
1/1/1971	12.8
1/1/1972	12.0

Source: European Economic Community, 1968

One effect of tariff reductions might be an increase in exports of kraft liner to the E.E.C. to the detriment of pulp imports[7] that enter the E.E.C. tariff-free under a quota of 1,935,000 metric tons. Above this figure there is a present tariff of six percent which will be reduced to three percent in 1972.

Seasonality

In the survey it was found that exports were used to smooth out variations in the domestic market. Indeed, in this industry, production follows demand very closely because of the bulky nature of kraft liner and the necessity of reducing inventory costs. Therefore foreign demand with different seasonal trends could smooth out seasonal variations in domestic production. This hypothesis is analyzed next.

Seasonal indexes have been calculated by comparing actual monthly

[7]The difference in tariffs on kraft liner and pulp is due to the fact that the cost of reflushing the pulp is about 10 percent that of the cost of kraft liner.

export figures from 1958 to 1968 with theoretical points given by the long term trend. The theoretical trend was obtained by a least squares regression line.

In Figure 14 seasonal variation in kraft liner production and total exports of kraft liner show peaks at the same periods: March, August and October. Only in December does a low level of production correspond to a peak on the export curve. Thus there is little indication that seasonal variations in exports smooth production variation. This can be explained by the fact that most peaks in economic activity tend to occur at the same time throughout the world.

Pricing Policy

This section covers pricing policy used in international trade of kraft liner. Some background on pricing policy in the United States is given first. Principal aspects of pricing policy at the international level are then examined. Finally the elements are integrated in an economic model.

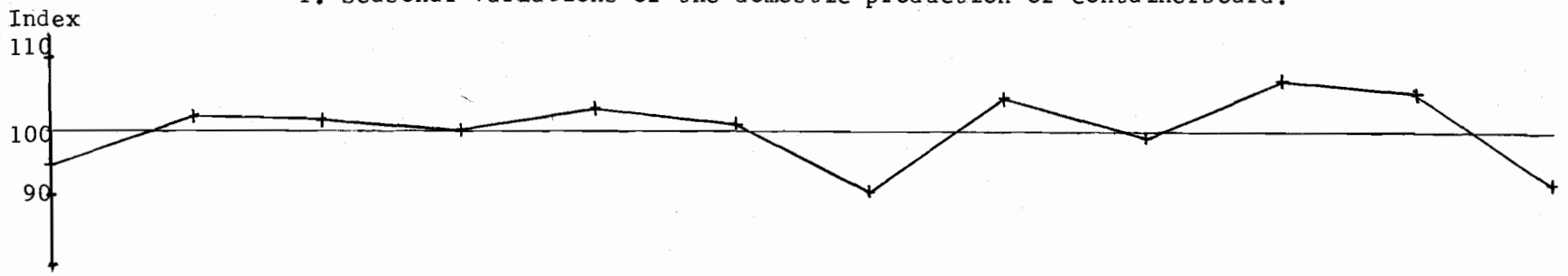
Pricing Policy in the U.S. Pulp and Paper Industry

To understand different pricing practices, some information must first be given on price making factors.

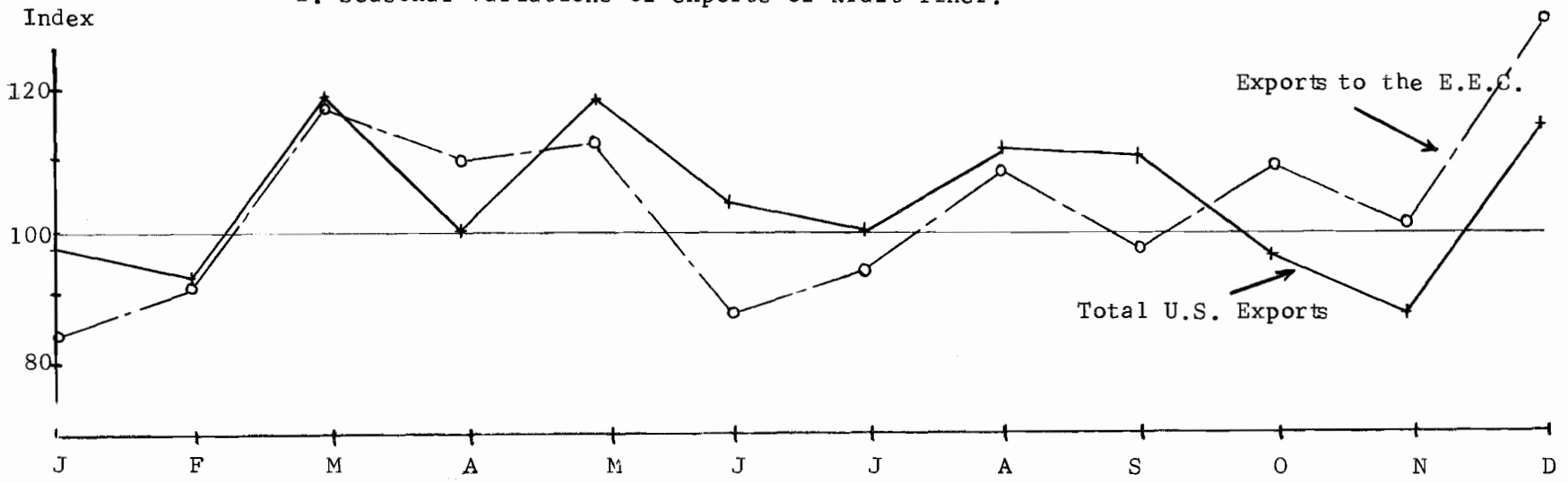
Price Making Factors

Stevenson (1940), Guthrie (1950) and Armstrong (1968) have pointed out the characteristics of pulp and paper demand and supply that determine, in large part, the price movements of these products and explain

1. Seasonal variations of the domestic production of containerboard.



2. Seasonal variations of exports of kraft liner.



Source: American Paper Institute. U.S. Bureau of the Census, report FT 410.

Figure 14. Comparison between seasonal variations in domestic production of containerboard, total U.S. exports of kraft liner, and exports to the E.E.C. of kraft liner.

to a considerable extent the price policies of sellers.

Demand for pulp and paper in general is quite inelastic (Guthrie 1950), because paper products constitute a relatively small fraction of the value of the finished product for which it is used. However, demand fluctuates within rather wide limits because of business activity.

When there is an excess capacity supply is elastic; it is inelastic when there is no excess capacity. This can be explained by the fact that a new plant represents a very substantial capital investment and takes time to build. Thus, to reduce his unit costs, the manufacturer operates as closely as possible at capacity.

Such characteristics of supply and demand are consistent with the classical representation of demand and supply in the pulp and paper industry. Demand grows slowly but regularly, while supply increases in leaps, with periods of high and low prices.

Because of manufacturers' tendencies to use reserve capacity (Guthrie, 1950), there is strong and almost cut-throat competition in the pulp and paper industry, However, since this industry requires much technical know-how and capital, the market structure is most aptly designated as oligopolistic. The extent of oligopolistic power is revealed when percentage production of paperboard is shown in relation to size of company (Table 27).

Table 27. Production by size of companies expressed as percent of industry.

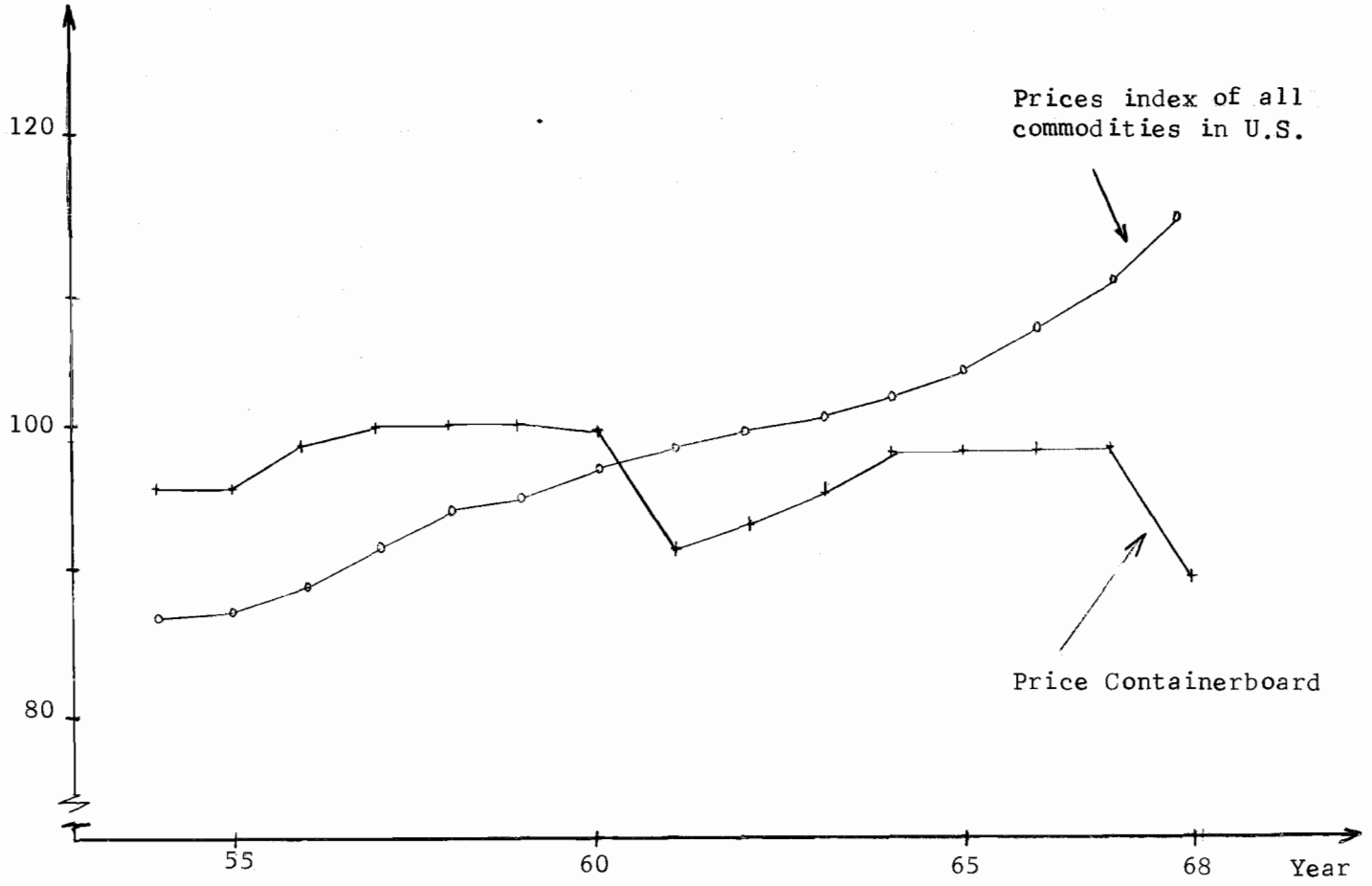
	10 Largest Companies	Second 10 Largest	Third 10 Largest	Balance
Percentage of Production	44	20	12	24

Source: American Paper Institute

Pricing Practices

In view of the nature of the industry, price and production policies of pulp and paper manufacturers have occasionally been directed toward reducing price competition. This has taken the form of price leadership, open price filing, and collusive or concerted action among individual producers or trade associations (Guthrie, 1950, p. 114). However, such restrictions on price competition have always been limited because of opposition from consumers and federal agencies enforcing the antitrust legislation inside the United States. In order not to work illegally, most companies do not engage in active restriction of price competition. They simply keep prices constant. They are to a certain extent reluctant to lower their prices, while buyers are not willing to pay a higher price when they can obtain the same goods (kraft liner is a standard product) from other suppliers. A certain uniformity of price results from this. This can be seen in Figure 15 where official prices were constant from 1957 to 1959 and from 1964 to 1967. However, because of the competition among manufacturers wanting to decrease costs by large-scale selling, announced prices are not always those actually charged. Thus the drop in 1968 indicates a slow reduction, in the form of increasing discounts, that had been occurring during preceding years -- a period of surplus in the United States.

In spite of manufacturers' desires to restrict price competition, the U.S. Antitrust Law and the nature of the industry seem to preserve competition in the domestic market.



Source: U.S. Bureau of Labor Statistics, Wholesale prices and prices indexes.

Figure 15. Price index of Containerboard.

Pricing Policy on U.S. Exports to the E.E.C.

Monopolies and other forms of restraint of trade are illegal in the United States since the enactment of the Sherman Antitrust Law in 1890. An exception, however, is provided in the Webb-Pomerene Act (1918), which permits an association of exporters to limit, or even eliminate, competition among themselves in export trade. The purpose of this act is to put American exporters on an equal footing with foreign monopolies or cartels in exploiting export markets.

For the pulp and paper industry the Pulp, Paper and Paperboard Export Association, formerly the Kraft Export Association, is organized under the Webb-Pomerene Law.

It was not possible to get information directly from this Association. According to secondary sources, however, its major functions are to establish uniform prices and to distribute information concerning foreign markets. Its members, including about ten companies, export 75 percent of the total U.S. exports of kraft liner.

It might be thought that such an association legalizes participation of American companies or associations in an international cartel. However, the Pulp, Paper, and Paperboard Export Association does not appear to have had any harmful effect on consumers of kraft liner so far. There is at present rather strong competition among suppliers of kraft liner to the E.E.C., and U.S. members are allowed to reduce prices below the minimum price fixed by the Association in order to meet Scandinavian competition. The Association does not have an export monopoly. Twenty-five percent of kraft liner exports come from non-members of the Association, who are free, according to the U.S. Antitrust

Law, not to export at the price fixed by the Export Association (Curry, 1968; Beuter, 1969).

Product differentiation, another aspect of price policy, is of two forms: sales services offered and product quality. Scandinavian suppliers have differentiated their products well. An answer to the questionnaire clearly emphasized this fact: "The E.E.C. is generally considered as the Scandinavian home country, and generally experience has shown that no degree of price competition will take it away from them".

Moreover, since the Scandinavian countries cannot supply the whole European market, they have specialized in relatively high quality kraft liner. Thus, if American manufacturers sell below Scandinavian manufacturers, it is to "equate the comparative qualities rather than due to price competition as such"[8].

European manufacturers take advantage of the tariff barrier. They have almost no control over price because of the small quantity of kraft liner produced. Moreover, most of their production is sold to affiliate box plants so there is little influence on the European price.

An explanation of the pricing policy integrating the above observations is offered in the next section.

Economic Model

Economic theory provides a framework for describing forces acting on the international trade of kraft liner. As mentioned before, most suppliers of the E.E.C. are members of national organizations which fix

[8]Cited from a reply to the questionnaire.

prices for all members. An economic model of oligopoly will be applied to the international trade of kraft liner.

Several models could be applied. However, one kind of model, the kinked demand curve, seems to suit particularly well behavior observed in the pulp and paper industry which is characterized, as mentioned before, by a certain price uniformity. Firms do not change their price-quantity combinations in response to small shifts of their cost curves. Each oligopolist knows that if one of his competitors lowers his price, the remainder will react by lowering their prices in order to maintain their market shares. If one of the oligopolists raises his price, his rivals are assumed to leave their own prices unchanged and thereby increase their market shares. The demand curve faced by a single firm or a group of firms in such a situation is presented in Figure 16.

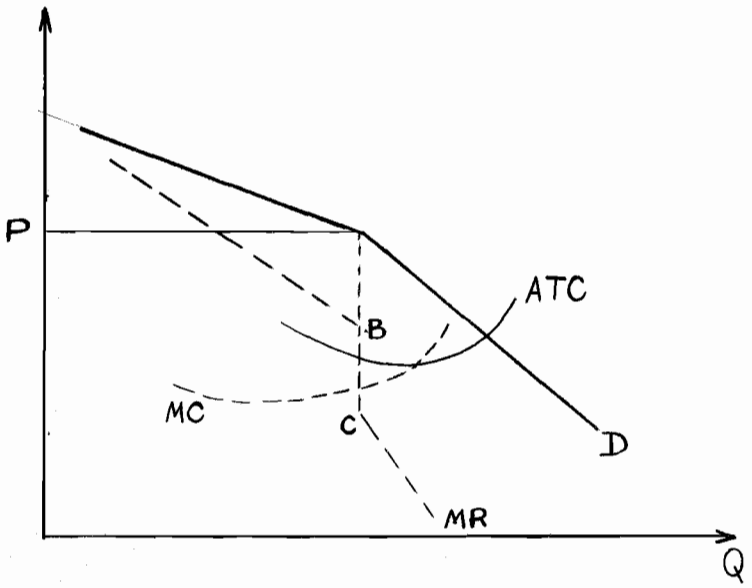


Figure 16. Sweezy kinked demand curve.

According to this model there is no incentive for the oligopolist to change either price or output as long as the marginal cost curve continues to cut the marginal revenue curve between BC. In the pulp and paper industry, the average variable cost curve is as shown in Figure 17 (Armstrong, 1968, p. 83). The shape of the AVC curve represents infinitely high costs at output levels above capacity.

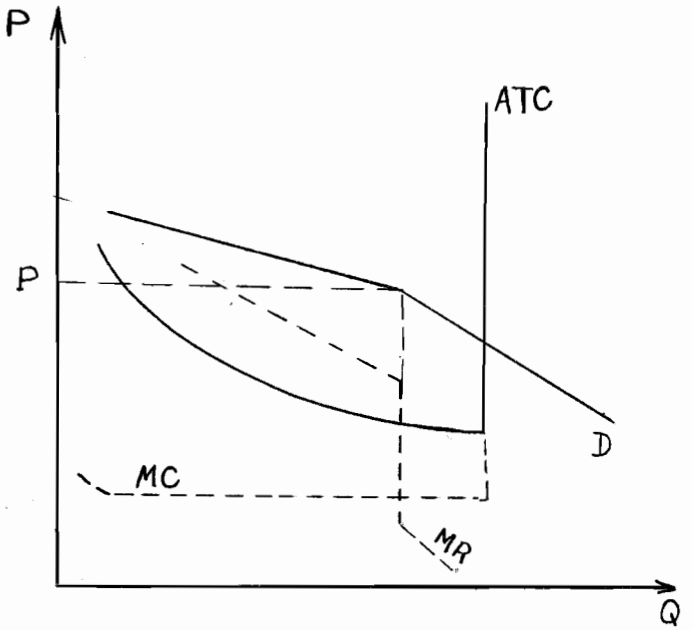


Figure 17. Kinked demand curve applied to the pulp and paper industry.

The next step is to adapt these curves to characteristics of the three suppliers of kraft liner to the E.E.C.: North America, the Scandinavian countries and the E.E.C. countries themselves. Each supplying area is distinguished by a specific cost of production and a specific demand curve. Price, which is C.I.F. Hamburg ($145), is considered to be given.

The E.E.C. countries are assumed to have the highest cost of

production (C_1, Figure 18) because of the price of raw material, and North America the lowest (C_3). The Scandinavian countries have an intermediate position (C_2).

The demand curves facing each supplying area are quite different. In the E.E.C. plants operate at maximum capacity and busy themselves with cost cutting because of strong foreign competition. Although strong ties exist between suppliers and customers, suppliers cannot consider a price rise at all. If they were to do so, even affiliates would defect to foreign kraft liner. A reduction of price can only be considered temporarily because of profit squeeze. Thus plants in Europe have a perfectly horizontal demand curve[9] to the left of the point marking current sales at the current market price, and a relatively elastic demand curve at lower prices, but of which they cannot ordinarily take advantage.

For Scandinavian and North American suppliers, it has been assumed that unit costs are below the going price. The ability to raise price above the given level depends heavily upon the degree of product differentiation.

Scandinavian suppliers have a demand curve (D_2) that is less elastic above the kink than is D_1. This is due to their specialization in kraft liner of high quality and to the services offered. North American suppliers also have a less elastic demand curve (D_3) than D_2 above the kink, but not for the same reason. The Scandinavian countries

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[9]The perfectly horizontal demand curve can also be explained by a model of oligopoly where the dominant firm (or country) establishes the market price and lets the small firms sell all they wish at that price. (C.E. Ferguson, 1969, p. 329)

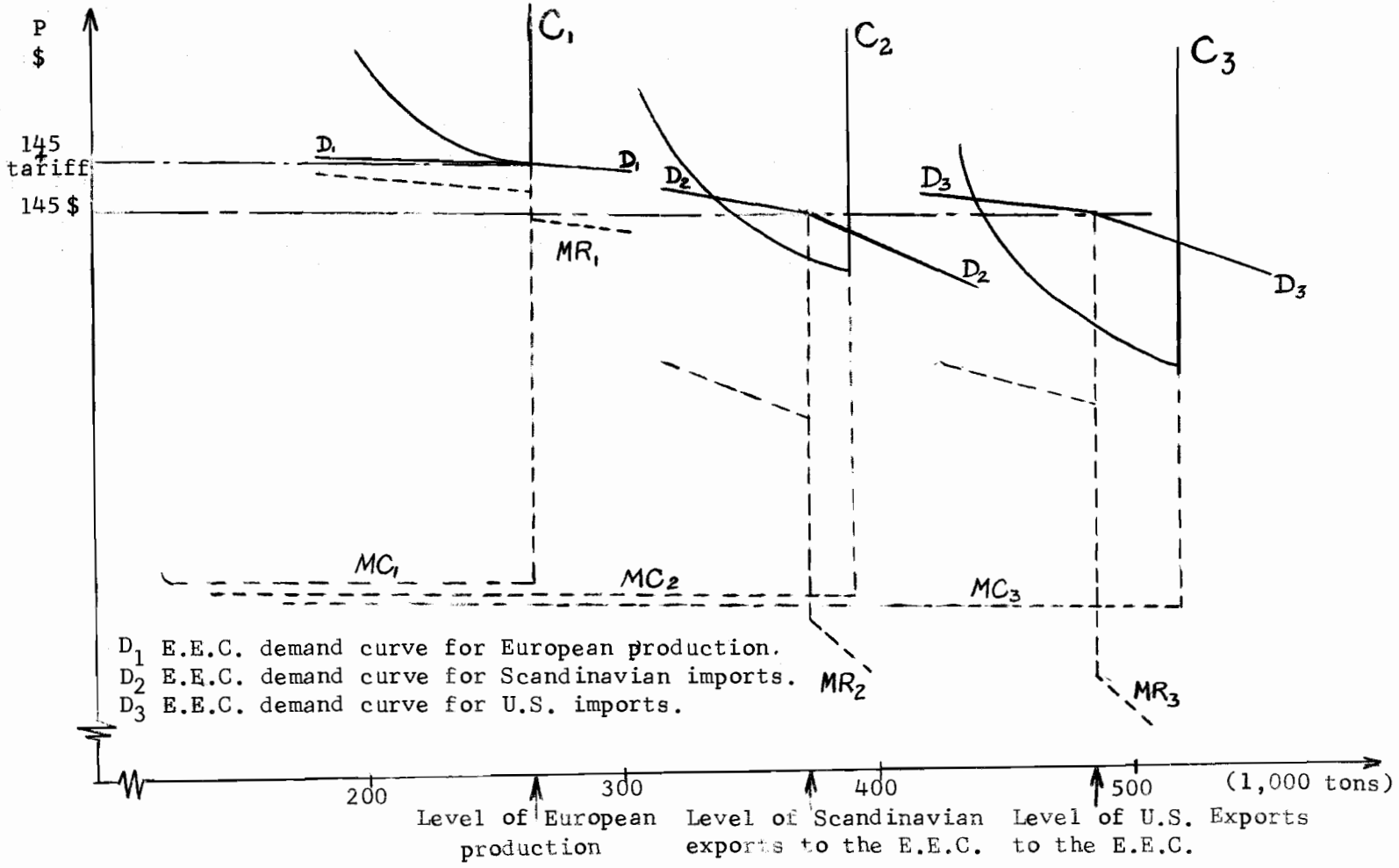

Figure 18. Kinked demand curves of the E.E.C. countries for European, Scandinavian and North American kraft liner.

cannot supply the whole E.E.C. market. North American countries, then, can raise their prices without too great a reprisal by the Scandinavian countries.

The demand curve below the going price for the Scandinavian suppliers will also be different from that of the North American suppliers. Both of them can reduce their sales price below the going rate without sustaining a loss, because their costs at high rates of output are somewhat lower than price. If the Scandinavian suppliers reduce their price, they may cause widespread competitive reaction because North American suppliers want to keep at least their share of the market. Moreover, the latter can decrease their price without loss. Thus, the Scandinavian countries will have a rather inelastic demand curve below the going price. On the other hand, if North American suppliers reduce their price, the reaction will be less extensive, because of the inability of the competitiors to reduce their price. Therefore the demand curve below the going price for the North American suppliers will be more elastic than that of the Scandinavian suppliers.

Applying the Model

Such a model provides an explanation of several aspects of price competition in the international trade of kraft liner.

The model shows that European producers are unable to influence prices. If they were not protected by a tariff, they would be forced out of business. Price depends on the other two suppliers and the competition between them.

Through the kinked demand curve, the model presents an explanation

of the uniformity of price and the reluctance of the suppliers to change their prices.

The model also shows that Scandinavian suppliers can be "devastating competitors" (Liner Mills Respond, 1969, p. 2). If North American suppliers do not reduce their price below P (for instance because of limited capacity of kraft liner available to the E.E.C.), their demand curve below P will become inelastic and that of the Scandinavian supplier will become elastic. Thus the Scandinavian countries will increase their share of the market even while having higher costs.

The model shows also that if costs increase so that price increases are necessary, Scandinavian suppliers will be able to increase price like the North American suppliers because of product differentiation, which is used to tilt the demand curve as well as to shift it from left to right. In this respect, product differentiation and reduction of price will increase the quantity sold.

This model can also be placed in a dynamic setting. It suggests that the North American suppliers might have the major share of the imports of kraft liner in the E.E.C. in the long run. This situation would allow them to determine the price in the E.E.C. countries with almost no competition. In such a case the Pulp, Paper and Paperboard Export Association would no longer be justified, foreign competition no longer existing. Moreover, non-members of this Association would have an advantage in selling in the E.E.C. at a lower price, reducing the monopolistic power of the Association. In any case, competition from substitutes would be an obstacle to the setting of high prices.

Summary

This model has helped to explain why North American and Scandinavian suppliers act as they do, especially with respect to price and output determination.

The most significant assumption is that North American suppliers have the lowest cost curve. This assumption is certainly correct if the cost curves considered are assumed to be long run cost curves. In the short run it might occasionally not be the case because of domestic economic fluctuations affecting international trade.

Another assumption is that of changing slope of the demand curve for kraft liner from different suppliers partly due to product differentiation but primarily because of expected competitive reactions.

Under these assumptions the model has helped to explain not only the role of costs but also the role of competitive retaliation, product demand and product differentiation in the trade of kraft liner.

Conclusion

This chapter shows the importance of product differentiation in the determination of direction of trade. Differentiation is the result of marketing efforts. Among the most important in the case of kraft liner are: (1) the choice of the channel of distribution which usually consists of a combination of foreign agents and sales representatives, (2) the quality of the product, and (3) the physical distribution of the product to Europe.

Another significant element in exporting is the attitude of a company toward export markets. Several replies to the questionnaire

and interviews indicated that establishment of steady relations with foreign customers for future business was a first objective. Difference between domestic and foreign price was always mentioned last. Therefore it seems that firms exporting kraft liner were in the process of becoming increasingly internationally oriented. The basic principle on which these corporations tend to operate is this:

> Taking the entire world as their market, they have organized production, distribution, and selling activities with as little regard for national (political) boundaries as the realities of time and place permit. (Business International Corporation, 1967, p. 90)

For these companies, decisions are made on the basis of what is best for the company as a whole, rather than merely what is best for domestic operations.

The size of a company seems generally to be a key criterion to becoming an international corporation. One relatively small company, however, has succeeded in establishing a foreign subsidiary for sales of linerboard. Becoming an international corporation, therefore, is not necessarily out of reach of small companies. Most exporting companies have sales offices abroad. This is the best way to become aware of foreign demand; knowledge of foreign markets is indeed the key to exporting. Moreover, the increasing number of sales offices established by U.S. companies shows that this channel of distribution must be the most efficient to satisfy the needs of European customers. The establishment of subsidiaries abroad, mostly box plants at present, seems to be the ultimate link in realizing complete vertical integration from the U.S. forest to the European consumer.

Price policy abroad is characterized by the existence of an export association, one of whose main purposes is to fix prices for U.S. exporters. International trade of kraft liner is rather oligopolistic by nature, the main suppliers to the European market being the Scandinavian countries and North America. The study of pricing policy, aided by an economic model, has emphasized product differentiation and expected competitive reaction instead of cost of production. Moreover, this model suggests that the North American supplier might have the major share of kraft liner imports in the E.E.C. in the long run.

VI. DETERMINATION OF A FORECASTING EXPORT MODEL

Introduction

The purpose of this chapter is to integrate information obtained from previous chapters into a forecasting model for the export of kraft linerboard from the United States to the E.E.C. This model will have the purpose of confirming relationships already known, and of discovering new ones which otherwise might not have been found.

A complete model should present not only the relationship between the supply of and demand for U.S. products in the E.E.C., but also the relationship between the markets in third countries and United States-E.E.C. trade. The construction of a complete model, which would include many variables, is beyond the scope of this study. It is possible, however, to construct two simplified models for illustrative purposes.

First, a Markov chain is used to analyze influences of alternative foreign markets (Latin America, E.F.T.A. etc.) on U.S. exports of kraft liner to the E.E.C. The output of the model is the future E.E.C. share of total U.S. exports of kraft liner. The interactions between alternative markets are expressed in terms of an exporter's probability of switching from the E.E.C. to a second or third more attractive country.

The second model, a forecasting equation, focusses only on the U.S. exports of kraft liner to the E.E.C. A single equation is employed rather than a multi-equation model, because only the volume of future exports is sought.

Determination of the E.E.C. Share of U.S. Exports of Kraft Liner

General Formulation of the Problem

As mentioned previously, the purpose of this part is to characterize the effects of other possible markets upon decisions made by an exporter to the E.E.C. The Markov chain is particularly useful in obtaining such information.[10]

The output of this model is a set of probabilities that U.S. exporters will switch from the E.E.C. to Latin America, E.F.T.A., or other countries, and also the probabilities of their switching from Latin America, E.F.T.A., or other countries to the E.E.C.

In applying the Markov technique to international flows of kraft liner, the model can be formulated in the following way: if m_{jt} is the share of the total export going to country j at time t ($j = 1,\ldots,r$ and $t = 1,\ldots,T$) and p_{ij} is the probability that any exporter will switch exporting from country i to country j in the next period, then the expected share of export going to country j at time t will be equal to the share of export at time t-1 multiplied by the probability that the export will continue to the same country plus any change due to switching export from country i to country j. That is:

$$m_{jt} = \sum_{i=1}^{r} m_{it-1}p_{ij}$$

---

[10] W.T. Dent (1967) has investigated the probability of an importing country switching from one exporting country to another for its purchases.

The transitional probabilities p_{ij} have the following properties:

$$\sum_j p_{ij} = 1 \qquad p_{ij} \geqslant 0$$

Obtaining the transitional probabilities is difficult, because export destinations of a particular exporter are unknown and only aggregate export figures are available. Nevertheless, methods have been developed to obtain estimates of the transitional probabilities: the least squares technique and linear programming to minimize absolute deviations. T.C. Lee, G.G. Judge and T. Takayama (1965, p. 742) have compared these two methods.

According to these authors the restricted least squares estimates of the transitional probabilities seems to be the best method. The problem can be formulated as follows: equation (1) reflects the exact relation. If errors are admitted in equation (1) to account for the difference between the actual and estimated occurence of m_{jt} then the sample observations may be assumed to be generated by the following linear statistical model:

$$m_{jt} = \sum_{i=1}^{r} m_{it-1} p_{ij} + u_{jt}$$

where u_{jt} is a random variable, uncorrelated with the m_{it-1}, and $E(u_{jt}) = 0$

In matrix form this can be written:

$$y_j = X_j p_j + u_j$$

where y_j is a (T x 1) vector of observations reflecting the share of exports to each country j at time t, X_j is a (T x r) matrix of realized share of exports in time t-1, p_j is an (r x 1) vector of unknown

transition probabilities to be estimated.

Given the above notation, the problem is then to find the vector p* that minimizes:

$$u'u = (y - Xp)'(y - Xp) \qquad (2)$$

subject to

$$\sum_j p_{ij} = 1 \qquad (3)$$

$$p_{ij} \geqslant 0 \qquad (4)$$

Since (2) appears as a quadratic form in p and the restrictions are linear, the specifications (2) (3) and (4) reflect the formulation for a typical quadratic programming problem. This estimation procedure of the transitional probabilities by quadratic programming has been studied by Judge and Takayama (1966, p. 169). The framework of their study has been used to find the transitional probabilities of the problem in question.

Results

For the sake of simplicity, the destinations of U.S. kraft liner exports have been divided into four major groups: E.E.C. countries, E.F.T.A. countries, Latin America, and other countries including those in the Far East and Near East. In Table 28 are the percentages of total U.S. exports from the years 1960 to 1968 that were shipped to these groups of countries. For this particular case, it is possible to express the export to country j in time t as a function of the export in time t-1. According to the Markov technique we have:

Table 28. Actual and Predicted Percentage of U.S. Exports of Kraft Liner To Latin America, E.F.T.A. Countries, E.E.C. Countries and Other Countries.

	Latin America	E.F.T.A.	E.E.C.	Others
			Percent	
Actual Data				
1961	3.8	46.4	27.5	22.3
1962	7.0	45.5	26.2	21.3
1963	12.8	38.6	27.2	21.4
1964	16.8	38.6	26.0	20.6
1965	23.3	23,4	30.6	22.7
1966	30.7	22.5	26.5	20.3
1967	28.4	21.7	29.3	20.6
1968	25.8	20.6	32.9	20.7
Predicted values				
1969	27.6	19.5	31.9	21.0
1970	28.9	18.6	31.5	21.0
1971	29.8	17.8	31.3	21.1
1972	30.6	17.1	31.3	21.0
1973	31.1	16.6	31.4	20.9
1974	31.6	16.1	31.4	20.9
1975	32.0	15.6	31.5	20.9
.....	....	....	....	....
1980	33.3	14.2	31.7	20.8
Long term share	34.3	13.0	31.9	20.7

$$\begin{bmatrix} E_{1t} & E_{2t} & E_{3t} & E_{4t} \end{bmatrix} \begin{bmatrix} p_{11} & p_{12} & p_{13} & p_{14} \\ p_{21} & p_{22} & p_{23} & p_{24} \\ p_{31} & p_{32} & p_{33} & p_{34} \\ p_{41} & p_{42} & p_{43} & p_{44} \end{bmatrix} = \begin{bmatrix} E_{1t+1} & E_{2t+1} & E_{3t+1} & E_{4t+1} \end{bmatrix} \quad (5)$$

E_{it} = exports to country i in time t

p_{ij} = transitional probability that a U.S. exporter will switch exporting from country i to country j

1 = Latin America

2 = E.F.T.A. countries

3 = E.E.C. countries

4 = other destinations

According to (5) the volume of exports to a country can be forecast for period t+1 if the quantities exported in period t and also the transitional probabilities are known. We have, by taking the exports to the E.E.C.:

$$E_{3t+1} = E_{1t}p_{13} + E_{2t}p_{23} + E_{3t}p_{33} + E_{4t}p_{43} \quad (6)$$

Exports to the E.E.C. in time t+1 will be equal to exports to Latin America in time t multiplied by the probability that exporters will switch exporting from Latin America to the E.E.C. ($E_{1t}p_{13}$), plus the quantities of exports to the E.F.T.A. countries in time t multiplied by the probability that exporters will switch exporting from E.F.T.A. to the E.E.C. ($E_{2t}p_{23}$), plus exports to the E.E.C. in the previous year multiplied by the probability that there is no change in the decision of exporters concerning exports to the E.E.C. ($E_{3t}p_{33}$), plus exports to other countries (group 4) in time t multiplied by the probability that exporters will switch exporting from other countries (group 4) to

the E.E.C. ($E_{4t}P_{43}$).

The transitional probabilities have been obtained by the Frank and Wolfe method for solving the quadratic programming problem.[11] Using the time series from 1961 to 1968, the probabilities are as follows:

	Column 1	Column 2	Column 3	Column 4	
Row 1	0.806	0.000	0.194	0.000	
Row 2	0.000	0.855	0.125	0.020	(7)
Row 3	0.208	0.000	0.661	0.131	
Row 4	0.000	0.091	0.124	0.785	

Table 28 gives the predicted share of total U.S. exports for the group considered. These predictions assume that the probabilities are constant over both the period studied[12] and the projection period. It is certainly more realistic to assume they are not constant but are influenced by prices, incomes, and other factors. This model, however, does not permit consideration of how such variables influence predictions.

According to the model, Latin American and E.E.C. shares of the total U.S. exports will increase, while the E.F.T.A. share will decrease and that of the other countries remain constant.

It is noteworthy that the shares of the E.E.C. first decrease, then increase. This is because exports to the E.E.C. in 1968, taken as a base, were extremely high. However, it can be shown that whatever

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[11]The computer program to find the transitional probabilities was developed by Billy Chou and Lynn Scheurman of the Statistics Department at O.S.U. Their contribution is gratefully acknowledged.

[12]Justification of this assumption is presented at the end of the chapter.

the year taken as a base, the projection tends toward the same limits. These limits can be obtained by the following technique (Kemeny, 1959, p. 394).

If P is the matrix of transition probabilities, and the n-step transition matrix P^n approaches a limiting matrix P*, each of whose rows is identical, the vector p*, having the same elements as any row of the matrix P^n, is uniquely determined from p* = p*P.

This equation, together with the fact that the elements of p* sum to unity, permits exact determination of the share of total U.S. exports received by a given group of countries. In this case matrix P* is:

$$\begin{bmatrix} .343 & .130 & .319 & .207 \\ .343 & .130 & .319 & .207 \\ .343 & .130 & .319 & .207 \\ .343 & .130 & .319 & .207 \end{bmatrix}$$

the rows of which are identical, and the vector of p* is given by:

$$\begin{bmatrix} .343 & .130 & .319 & .207 \end{bmatrix}$$

the elements of which are the long-term export shares for the four groups of countries. These long-run figures are in accordance with the trends from 1969 to 1980 noted above (Table 28).

The model, besides being used for prediction, can also give some idea of the behavior of exporters and the extent of substitution among export destinations. Referring to the estimated transitional probabilities (7) the main diagonal shows the probability that an exporter will repeat his exports to the country considered. This probability reflects "exporting loyalty". Exporting loyalty is high for all countries, but of these the E.E.C. has the lowest. The off-diagonal elements in the

matrix give the probabilities of switching exports from one importing country to another. Although the matrix shows that exporters are not very "loyal" in their exports to the E.E.C., they very often switch their exports from the E.E.C. to the third countries. This can be interpreted in two ways: there is high competition in the E.E.C. between U.S. and Scandinavian exporters, and/or U.S. producers' commercial ties with E.E.C. consumers of kraft liner are weaker than those with other countries.

From this latter interpretation an hypothesis can be drawn: directions of trade are determined by foreign affiliates of U.S. companies and other commercial ties, such as sales offices abroad. This can be tested by comparing the probability of repeated exports to a certain region with actual sales there by foreign manufacturing affiliates of U.S. paper companies.

Table 29 shows there is a relation between the probability of repeated exports and sales by foreign manufacturing affiliates except for the United Kingdom which has a higher probability of repeated exports from the United States than has Latin America. Apart from this, the relation suggests that U.S. affiliates have an impact on the direction of trade.

If the probabilities of switches from the E.E.C. to third countries (matrix 7, row 3) and of switches from third countries to the E.E.C. (matrix 7, column 3) are examined, the probabilities of switching between the E.F.T.A. and E.E.C. countries are very low. Probability of a switch from the E.E.C. to E.F.T.A. is 0.125 (row 2, column 3), and the probability of a switch from the E.F.T.A. to the E.E.C. is 0 (row 3,

Table 29. Comparison of Sales by Foreign Manufacturing Affiliates and the Probabilities of Repeated Exports.

Country	Sales by Foreign Affiliates	Probability of repeated exports
	Million dollars	
Latin America	178	0.806
Other areas	110	0.785
U.K.	102	0.855
E.E.C.	62	0.661

Source: B.D.S.A., 1967, p.7..

column 2). This indicates that the E.F.T.A. countries (the United Kingdom mostly) and the E.E.C. countries do not compete for U.S. exports. This suggests that a U.S. exporter could view both markets as a single market instead, because their structure is, indeed, the same with respect to kraft liner prices and Scandinavian marketing organization.

Europe, as a block, is thus an alternative market to Latin America and the other countries of the world. This is confirmed by a United Nations (1963) study of the pulp and paper industry in Latin America, which predicts that the Scandinavian share of the Latin American market will decrease in favor of the North American countries. This is due primarily to the latter's nearness to the Latin American countries and the advantage of the Scandinavian countries in supplying the rapidly growing demand for paper and paperboard in Western Europe.

In conclusion, the Markov chain model permits forecasting the future shares of four groups of importing countries in U.S. exports of kraft liner and analysing the influence of other countries on U.S. exports to the E.E.C. countries. The ability of the model to explain exports rests heavily, however, on the assumption that the transitional probabilities are constant over time.

Judge and Takayama (1965, p. 758) recommend that this assumption should be checked in order to reduce the chance of an inappropriate application of the model. Among the possible tests, one involves observation of the aggregate data. The aggregate data should have a significant trend that converges to a limiting vector. To meet this requirement the base period 1961 to 1968 was chosen. However, it has also been shown, by calculation of the long term export shares, that the model

was from a chain converging to a limiting vector (Table 28). Therefore the use of the Markov chain is justified by taking the base considered.

Forecast of U.S. Exports of Kraft Liner to the E.E.C.

In the preceding section the Markov chain model presented interrelationships among foreign markets for U.S. kraft liner. Now that influences of other countries on trade between the United States and the E.E.C. have been estimated it is necessary to look for factors directly influencing U.S. exports of kraft liner to the E.E.C. and integrate them into an export equation.

The general equation for exports of kraft liner is the following:

$$\text{U.S. domestic supply of kraft liner} = \text{U.S. domestic consumption} + \text{U.S. exports} - \text{U.S. imports}$$

Next the factors influencing each of these elements are considered. Demand depends upon the price of kraft liner, prices of competing and complementary goods, disposable income and industrial production. while supply depends on the price of the commodity, cost of production and prices of alternative products.

As foreign demand for U.S. exports is of concern here, transportation costs and tariffs can greatly influence supply and demand. They must, then, be added to the model. The factor of foreign supply to the United States has not been taken into account as U.S. imports of kraft liner are very low (40,000 tons in 1966).

The next step is to choose variables according to their availability and see how fundamental they are to the problem. In the particular case of exports of kraft liner to the E.E.C. the following factors

have been considered:

Factors influencing demand in the United States:

disposable income

price of the commodity, kraft liner

prices of substitutes: vinyl and polystyrene

Factors influencing demand in Europe:

GNP per capita

Factors influencing U.S. supply:

price of kraft liner in the United States

price of finished products: paper boxes and containers

price of wood pulp

Ocean freight

Because of a lack of data, the price of kraft liner in Europe has not been considered. Tariffs have not been included either, since changes in tariffs have only occured in 1967 and 1968.

From the above variables, the most relevant ones were selected. Preliminary observation of the simple correlation coefficients was carried out in order first to discover empirically the approximate form of the relationship, and secondly to understand and control the statistical selection of relevant variables.

The statistical selection was made through the stepwise regression procedure. The criterion for the choice of variables was that the R^2 value (the square of the multiple correlation coefficient) be the highest obtained subject to the following conditions: (1) that the combination of variables together appears to make economic sense, and (2) that all coefficients be significant at the five percent level of

significance or above.

Among the variables introduced, only three met the above criterion: U.S. disposable income, U.S. price of containerboard and U.S. prices of wood pulp. The others had coefficients that were not significant at the five percent level. The model which gave the highest coefficient of determination was:

$$Y = -621.62 - \underset{(2.67)}{6.64P_w} - \underset{(4.61)}{9.81P_c} + \underset{(19.65)}{0.51I} \quad [13]$$

$$R^2 = 0.985$$

Y = U.S. exports of kraft liner in 1000 tons (Bureau of the Census, Report FT 410)

P_w = price index of wood pulp in the United States (Bureau of Labor Statistics, 1955 - 1968)

P_c = price index of containerboard in the United States (Bureau of Labor Statistics, 1955 - 1968)

I = disposable income per capita in the United States (1961 price) (U.S. Council of Economic Advisors)

Values of t are given in parentheses below the coefficients. Figure 19 shows both real and predicted exports for the period 1955 to 1968. Discrepancies between real and predicted values occured particularly from 1955 to 1960. This is probably because variables that would reduce these discrepancies were not included in the model,[14] or because the economic relations prior to 1960 were of a different nature

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[13] It should be noted that the sign of the variable I is not in accordance with a priori expectation. This can be explained either by the intercollinearity of the variable or by the fact that exports contribute to the increase of the GNP

[14] Probably certain factors cannot be quantified, such as commercial ties.

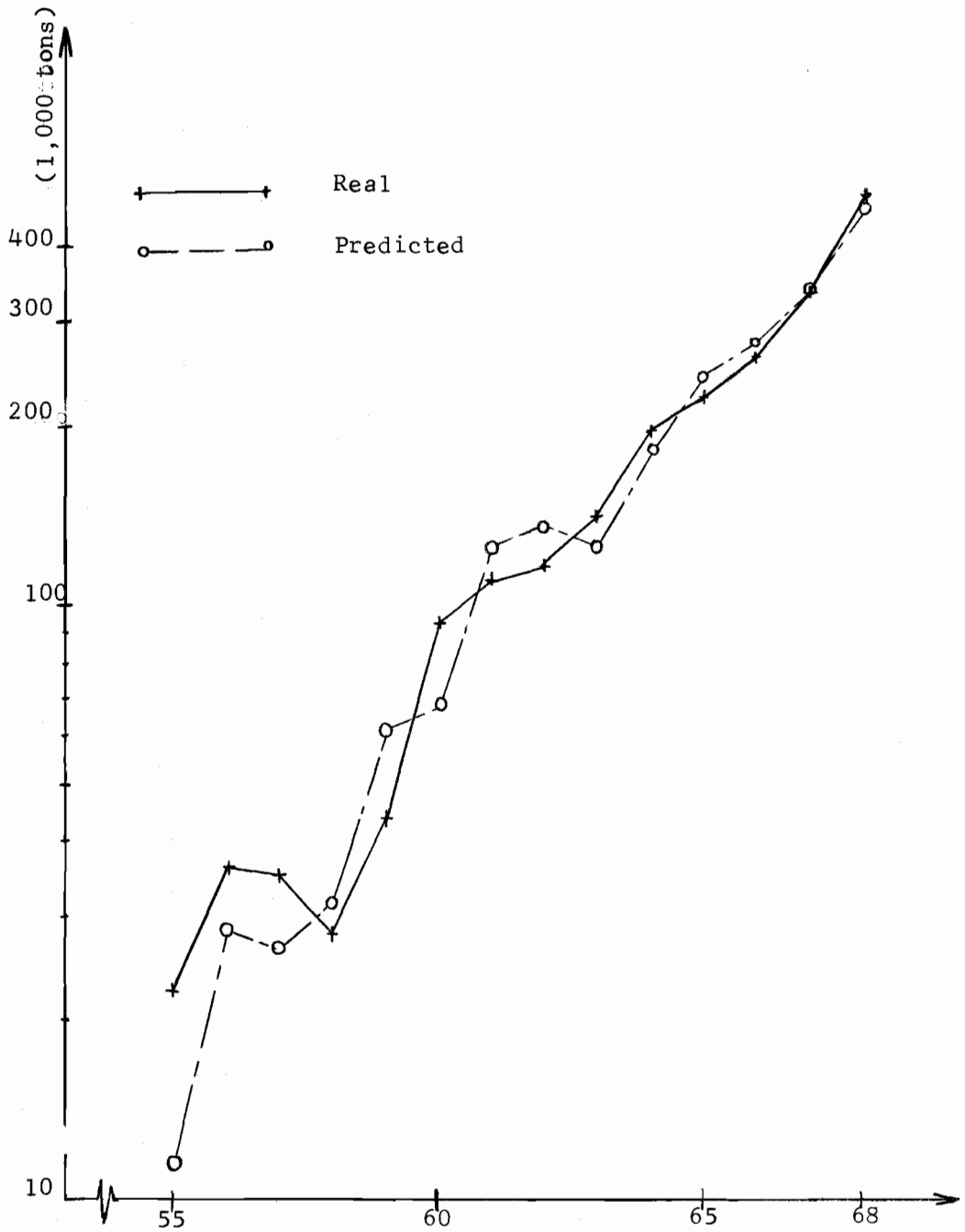

Figure 19. Real and predicted values of U.S. exports of kraft liner to the E.E.C.

to those after 1960.

The result indicates that besides the domestic consumption of kraft liner, the price of containerboard is an important factor in determining exports. Although this is understandable, the survey in the preceding chapter suggested that the price of containerboard was less important than the satisfaction of foreign demand. The model, however, rejected GNP per capita in Europe. Theory and fact, therefore, do not appear to coincide in this instance.

The price of wood pulp is included in the model. This reflects the fact that wood pulp can be a substitute for kraft liner.

It is noteworthy that the estimated volume of future exports depends on the future prices of containerboard and wood and consequently on future demand-supply relationships, which are rather unpredictable. The model, therefore, should only be used for short term projections -- for no more than one or two years ahead in which estimates of capacities are available.

Conclusion

The primary goal in this chapter was to integrate in a mathematical model elements influencing exports of kraft liner to the E.E.C. countries and then to see how this can be used for predictions.

It appears that the Markov chain and the multiple regression equation can be used not only as forecasting tools but also as analytical tools confirming points previously made and also generating new hypotheses concerning export loyalty and reasons for U.S. exports.

The Markov chain model showed that the probability of repeated exports by exporters was likely to be correlated with the sales of

U.S. subsidiaries abroad, while the multiple regression equation suggested statistically, contrary to impressions left by the survey, that price of containerboard, rather than foreign demand, was a more important factor affecting exports of kraft linerboard.

The best test of a forecasting model is its ability not only to predict U.S. exports over the sample period but more importantly to forecast beyond the sample period. As the future remains unknown, it is the degree of success with which a model explains actual export behavior that is a critical test of the structural hypothesis.

In this respect the two models, the Markov chain and the multiple regression equation, have been satisfactory. The regression equation explained with less than ten percent error exports during the period from 1963 to 1968.

The problem met in the use of multiple regression concerns the choice of independent variables. The independent variables for which long run and short run projections are available, such as GNP, population, income, do not fully explain U.S. linerboard exports. Moreover, these variables usually are intercorrelated, limiting their use in a forecasting equation. On the other hand, there are independent variables that better explain U.S. exports, such as kraft liner prices, but for which projections are either not available or subject to considerable uncertainty. These variables should then be used only for short term forecasting.

However, a combined forecasting model including independent variables for which long term projections are available, as well as those that cannot easily be projected, might be constructed in a further

study. Through sensitivity analysis, the effect of the latter variables on long term projections could then be seen.

In the case of a short term forecasting model, it would be interesting to include more variables in order to explain more fully variations in exports. Such a model on a quarterly basis could be useful for industry. One approach to this problem would be to use simultaneous equations or recursive equations. Although such techniques could prove valuable, they have not been treated here as they are beyond the scope of this study.

VII. SUMMARY AND IMPLICATIONS OF THE ANALYSIS

The original questions posed in this investigation were: Are the exports of kraft liner from the United States to the E.E.C. countries likely to increase even further? What marketing problems are involved in exporting to the E.E.C.?

Consideration of forest resources endowment was followed by examination of the competitive advantage of different areas supplying the E.E.C. The competitive position of each was estimated, based on margin obtained by the difference between the price of kraft liner in Hamburg and the cost of production and transportation to the E.E.C.

It appeared that actual directions of trade were not explained completely through the study of competitive advantage. Other factors of trade were then examined, particularly the possible influence of the U.S. domestic market on exports and the marketing organization of U.S. exporters.

A survey of U.S. exporters indicated that not only cost of production but also other elements, such as awareness of foreign demand, product quality and marketing organization abroad, could have a great impact on the direction of trade.

Among firms exporting kraft liner, most already had a combination of a sales office and foreign agents in the E.E.C. while half of them had subsidiaries in the E.E.C. Therefore, they were all in a position to get information about foreign demand. As these channels were the most frequent, it can be assumed that they present the best advantages for exporters. Although the principal exporters were the more important

pulp and paper companies in the United States, a relatively small company was engaged in international business. It had a subsidiary for sales of linerboard.

Differences between domestic and foreign prices were considered by exporters of kraft liner to be less important than the establishment of steady relations with foreign customers for future business. This implies that the companies wish to have long term commitments abroad justifying investments in a well organized channel of distrubution. The channel through U.S. agents, however, is still used by some companies

As freight is an important element of delivered cost, shipment by charter, with or without other forest products, was common. At present new overseas shipping systems are being inaugurated to reduce the transportation disadvantage of American exporters.

It has been shown, through an economic model, that product differentiation was desirable because it desensitizes demand to minor price differences. Moreover, the model places emphasis on product demand and competitive retaliation instead of on cost of production.

The companies exporting were found to be export oriented. However, for many U.S. companies the domestic market is very attractive, and it is difficult for them to satisfy this growing domestic market. Why should they export? Because opportunities abroad are still more attractive.

Recently, an important pulp and paper manufacturer, traditionally oriented to the domestic market, became interested in export simply because of excellent opportunities abroad. At present, the company is

looking for the best way to take advantage of these opportunities. This requires much planning, and studies of potential demand and of future U.S. exports are necessary.

Because awareness of foreign demand is an important factor of trade, demand for kraft liner in the E.E.C. was examined. It appears that the E.E.C. countries will not be able to satisfy their own demand for kraft liner and will rely more and more on foreign supply. Their imports of kraft liner are expected to increase at an average of eight percent per year. The United States is expected to increase its share of imports by the E.E.C., to the detriment of Scandinavia, especially Finland. Moreover, the F.A.O.'s projections of demand for wood in 1975 have shown an important roundwood deficit, making the dependence of Europe on American forest resources more probable.

Finally, all the factors influencing exports of kraft liner to the E.E.C. countries have been integrated into two forecasting models, the Markov chain and an export equation.

The Markov chain model forecasts the future share of four groups of importing countries (E.F.T.A. countries, E.E.C., Latin America, and other countries) and analyses the influence of other importing countries on U.S. exports to the E.E.C. It was shown that Latin America is a very attractive market but not the United Kingdom. The E.E.C. countries' share of U.S. exports will very likely increase. The Markov chain model also statistically estimates the "exporting loyalty" expressed in terms of probability that an exporter will repeat his exports to the country considered. It was found that "exporting loyalty" and sales by foreign affiliates were related, indicating the importance of ties

between a U.S. manufacturer and foreign subsidiaries as an influence on direction of trade. Such a model could also be used to study the behavior of importers.

The second model was a forecasting equation obtained by multiple regression. The introduction of further variables was limited by the number of variables for which long term projections are available. It is suggested that either a short term forecasting model including simultaneous equations or a long term forecasting model including only a few variables should be constructed.

In conclusion, the outlook for continued growth of kraft liner export from the United States to the E.E.C. is very favorable. Moreover, U.S. exporters are expected to increase their share of European imports, particularly if marketing effort is devoted to:

- developing awareness of foreign demand;
- establishing desire for steady relations with foreign customers;
- planning a relevant channel of distribution;
- differentiating the product either by improvement of quality (including willingness to meet foreign standards and sizes), by advertizing or by promotion;
- improving physical distribution to Europe, particularly by reducing transportation costs.

Each exporter must keep in mind, however, that the E.E.C. countries might not be the best market to export to and that products other than kraft liner might represent a better allocation of a firm's and

country's resources. International specialization according to the principle of comparative advantage remains the best way to allocate national resources for the mutual advantage of all countries.

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APPENDICES

APPENDIX A

General Information on Linerboard

GENERAL INFORMATION ON LINERBOARD[15]

Linerboard is used for the inner and outer facings of finished corrugated or solid fibreboard. There are two grades:

Kraft linerboard which is the most widely used in the United States. It is normally produced on a fourdrinier machine and consists of at least 85 percent virgin kraft pulp. For kraft linerboard, bursting strength is of chief importance, mainly due to shipping regulations; color and cleanliness are of secondary interest. Therefore, pulp for linerboard is produced by employing a full chemical kraft cook. Under these conditions the yield is about 50 percent. As for all kraft pulp, the active cooking agent is a mixture of caustic soda and sodium sulfide, and these chemicals are readily regenerated in the kraft waste liquor recovery and conversion systems.

Jute linerboard, particularly produced in Europe. It is commonly run on cylinder machines, using a pulp made from the mechanical disintegration of old corrugated containers, shipping sacks and selected kraft paper or board. It contains no jute fibre. The outer plies often contain some virgin kraft pulp to produce desired surface characteristics or strength.

Linerboard varies in weight from 26 to 110 lbs. per 1000 sq. ft., and in thickness from 0.009 to 0.030 inches. Several standard weights have been established as the result of railroad shipping classifications,

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[15]Based on: American Paper and Pulp Association, 1965; Encyclopedia Issue, Modern Packaging, 1968.

such as 26, 33, 38, 42, 47, 69 and 90 lbs. per 1000 sq. ft.

The two principal end uses of linerboard are corrugated fibreboard and solid fibreboard.

Corrugated fibreboard (or corrugated) is made of a sheet of "corrugating medium" sandwiched between two liners. Corrugating medium, made of neutral sulfite semichemical pulp, has a very high, flat crush resistance and consequently good cushioning qualities.

Solid fibreboard consists of a lamination of linerboard, or linerboard combined with filled chipboard (made of mixed waste paper).

APPENDIX B

Letter of Transmittal and Questionnaire

Dear Sir,

I am a graduate student from France working toward a Master of Science degree at Oregon State University, Corvallis. I came last year to the United States to study international marketing of forest products including pulp and paper.

For a thesis project I have chosen to study the potential for increased exports of containerboard to the E.E.C. countries. It will be particularly useful to me to know how U.S. exporters organize their international marketing, and to see what the relations are between the U.S. market and foreign markets concerning product quality and pricing policies.

I would much prefer to discuss this subject with you or one of your colleagues. Unfortunately, however, I will not have the opportunity in the near future of going East, so I must write to you instead.

Several questions are enclosed which I hope will cover the important points of my subject. If you could give me this information I would be very grateful to you.

The answers are for my own use and will only be presented in aggregate form in my thesis.

Whatever assistance you can give in my research will be deeply appreciated.

Sincerely yours,

I have divided the questions into four groups:

1. General information about your foreign activities.
2. Characteristics of the kraft linerboard and corrugating medium exported.
3. Marketing of these two products.
4. Pricing policy.

If there are areas which I have not included but which are essential to describe your foreign activities concerning exports of containerboard, would you please include them? Thank you.

1. General information about your foreign activities.

When and how did your firm become involved in exports of containerboard?

Does your firm export pulp and paper products other than containerboard, (kraft liner and corrugating medium)? What is the percentage of containerboard among the total exports of pulp and paper products and among the total production of your firm?

Do you export containerboard not manufactured by your company?

Where do the E.E.C. countries rank in importance compared with your other overseas customers?

2. Product quality. (If you do not export to the E.E.C. countries, would you please relate your answers to your major foreign outlets.)

What types of kraft liner and corrugating medium, if any, does your firm mostly export to the E.E.C. countries?

Is there a significant difference between them and those used in the United States?

Could you please give the characteristics (thickness, stiffness, tear, Müllen and treatment if any) of the main linerboard exported.

Do you have difficulty in meeting the standards of certain European countries?

Is the kraft liner of your firm known in Europe for a particular quality? If so, what?

3. Marketing.

Would you please describe which selling channel you use to reach your foreign markets, and how they have evolved over time.

What proportion of your total export of containerboard do you ship to your foreign subsidiaries or foreign affiliates (box plants probably) in the E.E.C. countries?

Do you finance your customers? Who provides forwarding freight and insurance services?

What other services do you offer to your overseas customers (quick delivery, technical support, etc.)?

Do you or your agents advertise abroad? Through which media? Do you use any other type of promotion?

How does your firm organize itself for international marketing? Through a separate international division, export manager or some other system?

To overcome Scandinavian competition, what is your general strategy? Do you offer a better quality, better service, or a lower price?

4. Pricing policy.

Does your firm intend to expand its exports?

Even if the U.S. market has a short supply, or if the price in the United States is high? If so, why?

How does the domestic price of containerboard compare with the price on the European market? On this subject, could you please indicate, if possible, the prices of kraft liner in Europe for several years.

Would you please number the following elements according to their importance to your company in making a decision concerning export.

Domestic price
The building up of the company's image
Foreign price
The establishment of steady relations with customers for future business

If there are any additional elements important to your company, could you list them also.

I would appreciate if you would state here any further information you think may be useful. Thank you.