



INSTITUTE OF SOUTHEAST ASIAN STUDIES

# **Effect of Liner Conferences on the Level and Structure of Ocean Freight Rates**

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LEVEL AND STRUCTURE OF OCEAN FREIGHT RATES**

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## INTRODUCTION

The carriers in the ocean freight transport industry may be subdivided into three main groups: (1) specialized carriers of liquid and dry bulk cargoes (tankers and carriers of ore, coal, lumber, and so forth); (2) tramps; and (3) liners. Large parts of the specialized carrier fleet are owned and operated by companies whose primary business is other than ocean shipping or alternatively are on long-term charters. In any case, their operation is sufficiently different to be outside the scope of this study.

Tramps and liners also differ in their manner of operation. Tramps do not operate over regular routes and on definite schedules. They concentrate on moving commodities in shipload lots and typically operate with shipments from one or very few consignors. Liners, on the other hand, are engaged in supplying transport services on fixed routes between ports and on regular schedules advertised in advance. They usually concentrate on carrying general merchandise.

The two categories of operators also differ in the manner in which freight rates are determined. While tramp rates are freely contracted between shippers and carriers, liner rates are determined

jointly by associations of shipping firms called "conferences". In addition to price setting, conferences may perform other functions such as controlling entry, allocating output among the members, and dividing the revenues.

The organization and operation of liner conferences resemble those of industrial cartels. It is not too surprising, therefore, that concern over effects of conferences goes back a long time. The Royal Commission on Shipping Rings in 1907 began a thoroughgoing inquiry into the conference system and in the United States the Alexander Commission held hearings in 1913-14. Since then conferences have been subject to numerous other hearings as well as a fair amount of research. McGee (Ferguson et al. 1961), however, claims that up to 1960

... Relatively little of a fundamental nature has changed since the inquiries of 1909 and 1914. The policy debated still centers around the same arguments and many of the same business practices. The Royal Commission and the Alexander Committee would have to learn relatively little to be conversationally at home in discussing conferences today. (p. 346)

In the 1960s and 1970s a large number of studies were published on various aspects of liner conferences. It appears timely, therefore, to review these studies in order to determine if McGee's contention still holds today and to suggest future research directions. This is the primary purpose of this paper.

Organization of the paper is as follows. Chapter II reviews alternative models offered to explain pricing behaviour of liner conferences followed by a survey of empirical studies in



Chapter III. Chapter IV evaluates studies of transport cost incidence. These studies focus on the question of whether the developing countries bear a disproportionate share of transport costs. Overall assessment of the current state-of-the-art and a specific recommendation for future research are presented in the final chapter.

## II

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### PRICING BEHAVIOUR OF LINER CONFERENCES

It is generally assumed that industrial cartels attempt to maximize joint profits. This goal, if adopted to explain pricing behaviour of liner conferences, yields a number of empirically testable implications. The necessary assumption is that a liner conference has harmonized the interests of its members so that it can be treated as an economic entity capable of profit maximization.

Rigorous derivation of a pricing rule for a profit-maximizing conference is provided by Bennathan and Walters (1969). They assume that the exporting country supplies goods to one outside market (the world). For this country's goods there is an infinitely elastic demand on the world market, so that prices must be taken as constant but the goods are produced under conditions of increasing costs, that is, the elasticity of supply may vary between zero and some number less than infinity.

In this case the conference would take into account the supply conditions in the market since the higher the rate charged by the conference, the lower the f.o.b. price, and, depending on the elasticity of supply, the smaller the amount of traffic offered. This is a simple application of Marshall's Second Law. The elasticity of demand for transport is

$$E_{\text{trans}} = \frac{-t}{P_s} \cdot E_s$$

where  $t$  is the freight rate,  $P_s$  is the f.o.b. price of goods, and  $E_s$  is the elasticity of supply of the goods.

Thus the marginal revenue of transporting this commodity is given by the formula:

$$MR = t \left( 1 + \frac{1}{E_{\text{trans}}} \right)$$

which, when substituted for  $E_{\text{trans}}$ , becomes:

$$MR = t \left( 1 - \frac{P_s}{tE_s} \right) = t - \frac{P_s}{E_s}$$

The conference will then fix the freight rate so that the marginal revenue is equal to the marginal cost of carriage:

$$t - \frac{P_s}{E_s} = \text{marginal cost of carriage}$$

Assuming that the marginal cost of carriage is the same for all goods and that it is constant over the relevant range, the pricing rule for the conference can be written as:

$$t^j = \frac{P_s^j}{E_s^j} = t^i = \frac{P_s^i}{E_s^i} = \text{marginal cost of carriage}$$

where subscripts refer to the "ith" and "jth" goods

respectively. Thus, if two goods have the same constant elasticity of supply, then the relative freight rates will be fixed according to the price per ton -- the higher the price per ton the higher the freight rate. Similarly, if, in the region of equilibrium, the prices of two goods are approximately the same, the freight rates of the goods will be higher, the lower the elasticity of supply.

However, not everyone agrees with the cartel pricing hypothesis. Studies, discussed below, on the basis of theoretical arguments and some empirical evidence have argued against this hypothesis and, more specifically, against the profit maximization goal and have offered alternative models to explain conference pricing behaviour.

Sturmey (1967) rejects short-run profit maximization presumably on the ground that "... The revenue curve, at the ruling freight rates, is usually inelastic both in total and for individual items within that total ..." (p. 197). A profit-maximizing monopolist, however, would not operate on the inelastic part of the demand curve for his product. He argues that "... This is a direct consequence of charging what the traffic will bear and keeping freight rates relatively low in relation to the value of goods carried ..." (p. 197).

Sturmey also appears to reject the profit-maximization hypothesis on the ground that it would lead to new entry. This argument is further elaborated in the "postscript" added to the reprint of the above article in Sturmey (1975). In this paper he proposes the maximization of the present value of the flow of net revenue from each market over the period within which scale of the firm remains constant as a more realistic hypothesis about behaviour of conferences than the profit maximization.

The proposed model is a modification of one developed by Fellner. It is not specified rigorously and leads to rather vague conclusions, that is,

... The maximum present value is obtained where the price is as high as possible without attracting new entrants and as low as possible without leading to a price war with rivals ... (p. 90)

However, even more important -- as Sturmev himself admits -- the proposed model is not empirically testable.

Gardner (1978) also rejects profit maximization on the ground that members of shipping conferences do not make super-normal profits. He attributes this to low or non-existent barriers to entry, an explanation unacceptable to many economists. However, as he points out, if this explanation is rejected one should observe that a conference like any other monopolist would operate on the elastic part of the demand curve. But it is a widely held opinion that the demand for many commodities moving in liner trades is relatively price inelastic.

Although Gardner claims that there is ample empirical evidence to show that members of shipping conferences do not make super-normal profits, the available data are scarce, fragmentary, and difficult to interpret. McLachlan (1961), for example, compared the total profit per gross ton of shipping earned by six British liner companies to the corresponding gross profit earned by seven British tramp companies for the period from 1949 to 1961. As shown in Table 1, degree of fluctuation is much greater in the case of tramp companies. However, the average gross profit per gross ton earned by the two types of companies over this period is not that much different.

TABLE 1  
Liner and Tramp Profits (£)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	Annual Average Gross Profit/Ton
Gross profits per gross ton of liner cos.	8.8	8.7	10.1	11.7	9.3	7.5	9.0	11.7	11.1	7.4	6.4	6.4	4.6	8.7
(As Index)	100	99	114	132	105	84	101	132	126	84	73	72	53	-
Gross profits per ton of tramp cos.	3.8	3.7	15.7	14.5	7.1	4.7	12.6	9.7	18.2	5.1	3.1	4.0	3.0	8.1
(As Index)	100	96	410	379	186	123	328	254	474	132	82	103	77	-

SOURCE: McLachlan (1961).

Admittedly, the data are very fragmentary. Total gross profit per gross ton of shipping may be a poor index of profits, and the sample of firms chosen and the 1949-61 period may not be very typical.

The evidence presented by Gardner himself is rather difficult to interpret. Table 2 shows two profit rates for UK cargo liners without any comparison. Tables 3 and 4 show various accounting measures for a sample of leading German and French firms, respectively. In each case cargo liner firms earn a relatively low profit. However, this evidence is somewhat inconclusive since West European liner firms may be high-cost producers and thus be earning low profits, although all the firms in the conference may be earning "super-normal profits". Nevertheless, the criticism is a valid one.

Gardner also offers an alternative price determination model which, he argues, provides a far better explanation than the orthodox economic model. Like Sturmey he assumed that the objective function of a liner shipping company is to maximize long-run profits and, as a consequence, liners within a trade practise entry-limit pricing. He further assumes that the long-run average cost curve falls continuously throughout its length although becoming less and less steep, particularly after the practicable optimum size of vessel for the trade route has been reached.

Next, he assumes that "... A firm in an established industry will price as though its long-run average costs were constant. In general, therefore, liner shipping companies will settle their prices for the carriage of regularly traded commodities in terms of their current short-run costs ..." (p. 202). The short-run costs consist of average direct costs (ADC) which are constant, and overhead costs which are decreasing. Thus, the

TABLE 2  
Profitability of UK Cargo Liners, 1958-69

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Profit before depreciation on ships at cost (%)	15.0	8.2	6.2	6.8	5.2	4.6	5.4	6.3	5.8	4.8	5.0	7.2
Profit after depreciation (including other income) on capital employed (%)	13.8	4.8	2.1	3.3	0.7	0.1	1.6	3.0	2.2	0.9	1.2	4.3

SOURCE: Gardner (1978).



TABLE 3  
Comparison of the Financial Results of Leading German Companies, 1976

Company	Sales Revenue	Gross Profit on Sales	Working Capital	Return on Sales (%)	Return on Capital Employed (%)	Turnover of Capital
Karstadt	6,370,712	333,438	2,776,929	5.23	12.00	2.29
Mannesmann	9,934,227	498,304	2,781,036	5.02	17.90	3.57
Hoechst	9,653,225	1,001,296	7,631,214	10.37	13.06	1.26
Daimler-B.	19,765,000	1,776,995	7,380,923	8.99	24.09	2.68
Schering	1,210,268	140,035	1,325,604	11.60	10.50	0.91
Ruhrkohle AG	11,389,930	147,905	9,488,184	1.30	1.56	1.20
Preussen- Elektra	1,595,933	118,340	2,335,673	7.40	5.06	0.68
Hansa	461,182	15,738	556,051	3.40	2.80	0.83
Hapag- Lloyd AG	1,473,164	67,296	1,261,561	4.57	5.33	1.16
Hapag- Lloyd AG (average) 1970-76				3.68	3.93	1.11

SOURCE: Gardner (1978).