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Some Market Power Implications of the Shipping Act of 1984: A Case Study of the U.S. to Pacific Rim Transportation Markets

Wesley W. Wilson and Kenneth L. Casavant

The Shipping Act of 1984 represents a new attempt to balance the benefits of a conference (cartel) system against its costs. This legislation may have increased conference market power by streamlining the regulatory process and expanding antitrust immunity. Alternatively, the legislation may have decreased conference market power by providing for the Mandatory Right to Independent Action and Service Contracts. We develop and estimate an econometric model and find that any increased market power is offset by competitive provisions when those competitive provisions apply. However, when those provisions do not apply, the Act may increase market power.

Key words: liner, market power, Shipping Act.

The U.S. Shipping Act of 1984 (Public Law 98-237) has had a direct influence on the structure of international ocean carrier conferences. International ocean liner conferences are organizations of liners operating collusively to set rates, allocate volumes, and control competition under antitrust immunity. Under the legislation, conference agreements are much easier to form and have greater antitrust immunity than before the Shipping Act. These changes likely enhance market power. However, the Shipping Act also introduced new provisions, representing "competitive intrusions," which likely reduce market power.

These new provisions include the Mandatory Right to Independent Action (MIA) and the right to form Service Contracts (SC). The MIA requires a conference to allow its members to depart from conference tariff rates.[1] In the years immediately following passage of the Act, over 19,000 independent actions were filed, suggesting widespread departures from the conference rate.[2] Service Contracts, typically price and volume commitments, are formed between shippers and carriers (in or out of a conference). Soon after passage of the Act, these Service Contracts were used by carriers to depart from conference agreements by offering reduced rates for extremely low tonnages.[3] It has been said that they "have probably done more to damage carrier revenues and viability than anything else in recent

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[1] Section 5(b)(8) of the Shipping Act requires that each conference agreement "provide that any member of the conference may take independent action on any rate or service item required to be filed in a tariff. . . ." Operationally, conference carriers file a tariff rate to which members have agreed. An independent action tariff rate is a departure from the conference rate by one of the members.

[2] This figure was given by Ron Gottshall of the Transpacific Westbound Rate Agreement (TWRA) and is reported in Davies (1987).

[3] The fact that Service Contracts were filed with extremely small tonnages may evidence the use of contracts not for service per se but rather as a means to depart from cartel prices.

Western Journal of Agricultural Economics, 16(2): 427–434

years."[4] Thus, from reduced filing standards and expanded antitrust immunity, market power may have increased, while from the MIA and SC provisions, market power may have decreased. Our purpose is to evaluate empirically the effect of the Shipping Act on market power and rates, accounting for changing market conditions.

Changing market conditions, including bunker fuel prices, currency exchange rates, and carrier capacity, complicate evaluation of the Shipping Act. In the last decade each of these market conditions varied significantly and cloud the effects of the legislation. First, real bunker C fuel prices increased until the mid-1980s, positively influencing rates. Coinciding with the passage of the Shipping Act, bunker C fuel prices began to fall and continued to fall, negatively influencing rates. Second, exchange rates (yen/$) increased until the mid-1980s, negatively influencing rates. Again, coinciding with passage of the Shipping Act, exchange rates began to fall and continue to fall, positively influencing rates. Third, capacity in some trades (e.g., from the West Coast to Pacific Rim countries) increased until the mid-1980s, negatively influencing rates. Still again, coinciding with passage of the Shipping Act, capacity temporarily fell, positively influencing rates. In summary, a variety of coincident changes in market conditions must be accounted for in an evaluation of the Shipping Act through an analysis of rates. Our analysis formulates an empirical model on the basis of the New Empirical Industrial Organization (Bresnahan) which allows an econometric model to account not only for changing market conditions but also for changing legislation impacting market power.

The Shipping Act of 1984

The Shipping Act of 1984 represents the most significant legislation affecting regulation of the liner market since the Shipping Act of 1916. The Act reflects a general policy in U.S. transportation to strive for a minimum amount of government intervention to foster an efficient transportation system. However, due to the international character of the liner market, the Shipping Act also added a notion that the policy should be "insofar as possible, in harmony with, and responsive to, international shipping practices" (Public Law 98-237, Section 2).[5]

The Shipping Act substantially changed the role of conference agreements. Conferences operating in U.S. trades must operate subject to a conference agreement which satisfies specific requirements under U.S. laws. The agreements allow members under Section 4 of the Act to (*a*) discuss, fix, or regulate transportation rates with antitrust immunity; (*b*) regulate the volume or character of traffic carried; and (*c*) control, regulate, or prevent competition in international ocean transportation. By most accounts, these characteristics of conference agreements define a cartel operating under antitrust immunity. Historically, agreements were filed with the Federal Maritime Commission (FMC) for approval which would then serve notice to interested parties and hold hearings. As pointed out by Mickey:

> There was no time limit for these proceedings; not surprisingly, approval of many of these agreements by the FMC took years. (p. 330)

A major change afforded by the Shipping Act was a substantial reduction in approval time. Specifically, under the Shipping Act the FMC no longer has the authority to disapprove agreements unless the agreements do not satisfy specific standards. These standards, covered in Section 5 of the Act, require the conference to allow equal terms of entry, allow exit without penalty, and provide the right to independent action. When these and the remaining standards of Section 5 are satisfied, the agreements become effective either 45 days after filing or 30 days after publication in the Federal Register. The Shipping Act does offer some protection over excessive market power in that cases where:

> the Commission (FMC) determines that the agreement is likely, by a reduction in competition, to produce an unreasonable reduction in transportation service or an unreasonable increase in transportation costs, it (the FMC) may, bring suit ... to enjoin operation of the agreement. [Public Law 98-237, Sections 6(g) and 6(h)]

But in bringing suit, the burden of proof is on the FMC. Even with this protection the process

[4] This statement by Ron Gottshall, managing director of the TWRA conference, is reported by Davies (1987). For a more complete discussion of these issues see Wilson and Casavant.

[5] Earlier research by these authors more completely describes the Shipping Act and its implications for agricultural trade off the West Coast. See Wilson and Casavant; and Casavant, Wilson, and Caron for further reference.

is considerably streamlined, and agreements are easier to form and offer the potential for greater market power to carriers.

The conference in the transportation market off the West Coast to the Pacific Rim is the TWRA. The conference-set rates appear to reflect the increase in market power available to conferences. Since the Act, rates have increased both in level and volatility, and containers seem to have been rationed (Casavant and Wilson). All of these activities have caused lost sales and, for some commodities, lost markets due to the short notice and magnitude of rate adjustments. Further, the TWRA has refused to allow Service Contracts since about 1987, eliminating one of the competitive balancing elements of the Shipping Act.[6]

Our earlier research (Casavant and Wilson; Wilson and Casavant) examined shipper perspectives on the impact of the shipping conference on transportation rates. Twenty-five of 27 firms felt strongly that the conference had held rates higher than rates would have been without the conference, with the perceived rate increase to be 10.7%. These values allowed an estimated potential for increased trade of 10–14% if the conference system were abandoned.[7] It was evident that shippers felt strongly that the conference was exploiting its market power.

But it also appeared that the two competitive provisions afforded by the Act, the MIA and SC, were effective in reducing rates. Eighty percent of the agricultural shippers felt there was a need to retain the Mandatory Right to Independent Action, with 70% reporting that at least some of their tonnage had moved under independent action rates over the 1985–87 period. Service Contracts were favored by 87% of the shippers even though only about 15–20% of the shippers were able to negotiate and use Service Contracts. The effectiveness of these two issues was documented by a regression analysis of rates. Shippers, using independent action rates or Service Contracts, were able, in four of the five commodity groups, to decrease their average per-container rate by 5–20% (Wilson and Casavant).

Conceptual Framework

We use an econometric approach to investigate the issue of market power in international liner markets before and after passage of the Shipping Act of 1984. There are a wide variety of previous studies of liner rates. These include Jansson and Shneerson; Heaver (1972, 1973); Davies (1983); and Byington and Olin. None of these studies assesses the regulation of rates directly, but they are useful to specify the equations used here. These studies are generally based on commodity-specific characteristics (e.g., value, stowage factor, quantity shipped, weight, ease of loading, etc.). We control for these variables by estimating a separate equation for each commodity.

We first develop a model of cartel pricing which allows simultaneous evaluation of changing market conditions and changing legislation. The initial model is a monopoly (perfect cartel) pricing model. We then extend the simple model of perfect cartel pricing to a model of imperfect cartel pricing.

The effectiveness of the conference in establishing rates is its ability to reach joint profit-maximizing outcomes. We provide the usual model of joint profit maximization and then augment the model for our specific case.

Our purpose in specifying these models is to provide a model of pricing behavior based on structural characteristics of the market (e.g., cost, demand, and pricing relations) accounting for both changing market conditions and legislation. The result forms the basis for the empirical model and guides discussion of the empirical results. We begin with the assumption that the conference seeks to maximize joint profits. That problem is given by:

$$\text{(1)} \qquad \text{Max } \pi = P(Q; X^D)Q - C(Q; X^C),$$

where π is cartel profit; $P(\bullet)$ is the inverse demand schedule; Q is cartel output; X^D are demand shifters (e.g., exchange rates); $C(\bullet)$ is the cartel cost function; and X^C are cost shifters (e.g., fuel, capacity). The first-order condition for profit maximization is

$$\text{(2)} \qquad \frac{\partial \pi}{\partial Q} = P'(Q; X^D)Q + P(Q; X^D) - C'(Q; X^C) = 0,$$

[6] While the Shipping Act allowed Service Contracts, the right of independent action on Service Contracts was unclear in 1986. Specifically, it was unclear that an individual carrier member of a conference could form contracts separately from the conference. Thus, if a shipper wanted a Service Contract, it had to negotiate directly with the conference and not its members.

[7] In this study, Pacific Northwest shippers were asked to give their evaluation of the percentage effect of the Shipping Act and the conference system on rates as well as the effect of price changes on quantity.

where P' is $\partial P(\bullet)/\partial Q$ (the slope of the inverse demand function) and $C' = \partial C(\bullet)/\partial Q$ (marginal cost). In equation (2) the effectiveness of the cartel is perfect. This assumption is relaxed by treating the effectiveness of the cartel as unknown and by estimating that effectiveness.[8] The result is a modest revision of equation (2). Specifically, equation (2) is rearranged and the departure of rate from marginal cost is parameterized as:

$$P = C'(Q; X^C) - P'(Q; X^D)Q\theta, \tag{3}$$

where θ is a "market power" parameter. Note that values of θ can be interpreted as a measure of cartel effectiveness. The cartel is perfect in that the joint profit-maximization result occurs when $\theta = 1$. Similarly, the cartel is not effective in that the competitive result occurs when $\theta = 0$. A more complete model could specify more exacting forms of θ using explicit assumptions of rivalry. Our intent here is to simply test whether θ has changed as a result of the Shipping Act, and we do not explore the complications of introducing rivalry explicitly.

A complete model, the New Empirical Industrial Organization system, is defined by

$$P = P(Q; X^D), \tag{4}$$
$$C = C(Q; X^C), \text{ and} \tag{5}$$
$$P = C'(Q; X^C) - P'(Q; X^D)Q\theta. \tag{6}$$

We assume that θ is constant[9] (or at least not dependent on P or Q) and solve equations (4) and (6) yielding reduced forms for rates and quantity. The reduced form for rates is the basis for our empirical results:

$$P = P(X^D, X^C; \theta). \tag{7}$$

In equation (7) there are measurements for both X^D and X^C (the demand and cost shifters including exchange rates, fuel prices, and capacity).[10] However, θ is unobserved, yet is the focal point for the Shipping Act of 1984. Cartels, conferences operating subject to an agreement, are now easier to form and operate with expanded antitrust immunity, suggesting θ has increased. However, in the formation of conference agreements certain "competitive intrusions" (i.e., the Mandatory Right to Independent Action, Service Contracts, etc.) must be part of the agreement, suggesting market power has been reduced. We account for these possible outcomes of the legislation by parameterizing θ in equation (7) as a function of the Shipping Act of 1984. That is,

$$\theta = \theta(\textit{Shipping Act of 1984}), \tag{8}$$

and test whether θ has changed as a result of the legislation.[11]

The particular demand and cost variables in the model include exchange rates, bunker C fuel prices, and shipping capacity. The influences of these variables on shipping rates cloud the effects of the Shipping Act and, therefore, are accounted for in the empirical model.

Exchange rates may enter the reduced form from either the demand or supply side of the market. As the exchange rate (measured in foreign currency per dollar) increases, the value of the dollar increases and the demand for U.S. exports and the derived demand for transportation are expected to fall. Further, this negative influence on rates may be reinforced from the supply side of the market. Specifically, as exchange rates increase, depressing the demand for exports, there is an accompanying increase in import demands. While the effect on capacity cannot be unambiguously signed,[12] an increase in the exchange rate may result in an increase in capacity, resulting in more capacity serving fewer loads in the export market thereby reinforcing the negative effect of capacity on rates in the export market. In the early 1980s exchange rates were increasing, having a negative influence on transportation rates. However, in the mid-1980s exchange rates were decreasing, having a positive impact on export demands and, therefore, the demand for transportation to Pacific Rim markets.

On the supply side of the market there are two other market determinants expected to af-

[8] The basis for this approach follows from the New Empirical Industrial Organization. See Bresnahan for a complete review of this literature.

[9] A more general form could result simply by assuming that implicit in the pricing relation is some inherent degree of market power and then defining θ as that inherent degree of market power. We simply note this generality and point out that our purpose is not to identify θ but rather to test whether it has changed.

[10] We note the qualification that the reduced form for rates could result from other specifications (e.g., footnote 12).

[11] The specific function for θ depends on the estimating equation.

[12] A referee pointed out that if conferences in the westbound and in the eastbound cooperate, this particular comparative static result is ambiguous. Indeed, a formal model of "cartel cooperation" (two interdependent cartels cooperating in decisions) results in the effect as being ambiguous. However, for the effect of capacity on price to be positive, the effect of a change on quantity must be negative (increasing prices) and must dominate the negative effect from a shift to the left in export demand. It is further noted that for a zero quantity effect, the change in export prices is unambiguously negative. Details are available from the authors.

fect liner rates and to be critical in assessing the impact of the Shipping Act. These include bunker C fuel prices and capacity. We include the Producer Price Index for residual fuels as an explanatory variable to account for the effects of changing bunker C fuel prices on marginal cost. Not only do increases in bunker C fuel prices increase marginal costs, but bunker C fuel is often assessed directly in the tariffs,[13] each leading to increases in rates. However, since the index is based in U.S. dollars, changing exchange rates may influence the price index. Thus, the effects of exchange rates may again enter on the supply side. Nonetheless, given exchange rates, the partial effect of fuel price changes on tariff rates is positive.[14] Similar to exchange rates, fuel prices increased in the late 1970s and early 1980s. Then, coinciding with passage of the Shipping Act, fuel prices began to fall and have continued to fall. We expect the effects on rates to be positive due to the influence on marginal cost.

Tonnage capacity is a direct supply-side determinant of rates. Capacity is determined by a "total freight revenue" function, i.e., accounting for all liner trade and competition (Shneerson). Capacity is allocated through a system of discriminatory pricing where higher rated (e.g., high value) commodities receive a higher priority (the low-rated commodities are priced out of the market). As capacity increases, rates for a particular commodity fall as carriers seek opportunities to load ships. Throughout the period, capacity increased steadily, having an expected negative influence on rates. However, about the same time as passage of the Shipping Act, capacity dipped, resulting in expected increased rates.

Econometric Model and Data

The data range from quarter 4 of 1978 through quarter 2 of 1987. Five groups of commodity rates are represented. These include apples, fries, hay, onions, and lumber shipped to Taiwan (apples) and Japan (fries, hay, onions, lumber). The rates were gathered from FMC tariff records by TRANSAX, a division of the *Journal of Commerce.* The result consists of rates expressed in a wide range of units (e.g., million board feet, boxes, etc.) which were converted to 40-foot container equivalents. Several rates could be reported at the same time. Given the multiplicity of rates, we used the minimum of the available rates.[15] Thus, the rate employed is the minimum tariff rate in effect and represents the total rate (i.e., includes, if any, bunker C fuel adjustments, currency adjustments, and container yard charges).

Perhaps the most controversial aspect of using tariff rates to examine the impact of the Shipping Act is that the Shipping Act introduced Service Contracts. Service Contracts are not part of the tariff and are therefore not part of the data. However, in our companion studies the use of Service Contracts was minimal for all commodities represented.[16] As a final check on the procedure used to generate a consistent and comparable rate series, we sent the original rates, a complete description of the methodology,[17] and the compiled rates to selected shippers, freight forwarders, and industry analysts for their inspection. Without exception, the respondents reacted favorably to both the methodology and the compiled rate structures. Also, limited data were available from a survey and, through time, by requests made to exporters. The compiled data compared favorably to the data provided by exporters.

The remaining data were all taken from published sources. Capacity is represented by the total number of containers shipped off the U.S. West Coast (in 1,000 twenty-foot container-equivalent units) as reported in *Lloyd's Shipping Economist* (Lloyds of London). Those data, reported monthly, were converted to quarterly periods. The residual fuel Producer Price Index[18] was taken from *Producer Price Indexes* (U.S. Department of Labor, Bureau of Labor Statistics). These data are reported on

[13] Bunker C fuel adjustment factors allow increases in fuel prices to be directly assessed in FMC tariffs.

[14] Since the index is based in U.S. dollars, changing exchange rates may indirectly affect prices by affecting the index. Only the partial effects of the exchange rates on prices are estimated. To capture the full effect of exchange rates using the data at hand, the indirect effects operating through the fuel price index must be included.

[15] A similar procedure is used by the FMC Bureau of Economic Analysis. (See FMC Bureau of Economic Analysis for further reference.) Further, the patterns of the mean rate and the minimum rate through time are very similar.

[16] See Wilson and Casavant; and Casavant, Wilson, and Caron.

[17] A complete description of the methodology is available upon request.

[18] Due to the lack of a consistent fuel price series, the Producer Price Index for residual fuels was used in this analysis.

a monthly basis but were converted to a quarterly basis using a three-month average. The final variable is the exchange rate, measured relative to the U.S. dollar and was taken from the United Nations publication *Statistical Indicators for Asia and the Pacific.*

These data were employed using the following model to evaluate the effects of the Shipping Act:

$$(9) \qquad P_i = P_i(\textit{Capacity, Residual Fuel, Exchange Rate, Shipping Act}),$$

where[19] P_i (price) is the rate per 40-foot container-equivalent deflated by the Consumer Price Index for commodity i;[20] *Capacity* is the total sailings from the West Coast in 1,000 twenty-foot container-equivalent units; *Residual Fuel* is the Producer Price Index for residual fuels (base = 1967); *Exchange Rate* is the exchange rate expressed in foreign currency per U.S. dollar; and *Shipping Act* is a binary dummy variable taking a value of one for periods after the Shipping Act was introduced and a value of zero for periods before passage of the Shipping Act.

Rates for each commodity in equation (9) represent the solution for conference decision making—the five rate functions represent a reduced form for rates. Specifically, we take as given a "small" commodity hypothesis that total westbound capacity is not affected significantly by the demand for individual commodity transportation and that the remaining variables also are not determined by individual commodity demands.

Since demand, cost of service, and legislation vary across the commodities, we expect that the parameters of the reduced forms vary across the five commodities. Nonetheless, the direction of the comparative statics on market fundamentals is the same. That is, an increase in *Capacity* is expected to decrease rates; an increase in *Residual Fuel* is expected to increase rates; an increase in *Exchange Rate* is expected to decrease rates; and the effect of the *Shipping Act* is an empirical question.

Results

In estimation both linear and log specifications were examined. The log specification was employed although the linear specification yielded qualitatively similar results.

Since the rate functions are reduced forms, OLS is an acceptable estimation procedure. Initial results suggested the presence of serial correlation. Further, the results might be affected by heteroskedasticity (i.e., the legislation is thought by some to have increased the volatility of rates). Hence, the final results, reported in table 1, are corrected for serial correlation and heteroskedasticity using the Newey and West correction.

All significant coefficients are of the correct sign. The effects of capacity and exchange rates are negative and significant for all commodities. The effect of residual fuels is generally positive but is significantly positive for hay and onion movements. And, explanatory power is quite high with R^2 values ranging from 69–89%.

In terms of the central hypothesis of the study, the effect of the Shipping Act on market power, the results are mixed. Specifically, the effect of the Shipping Act is statistically significant for apples, fries, and lumber. For hay and onions the effect is negative but is not statistically significant. The effect on apples and fries is negative and significant, while for lumber the effect is positive and significant. The most striking result is the positive and significant effect of the Shipping Act on lumber rates. This result may reflect the importance of competitive intrusions on cartel market power. Specifically, lumber products are not given the MIA provision in the Shipping Act. The MIA provision states:

> [agreement must] provide that any member of the conference may take independent action on any rate or service item required to be filed in a tariff. . . . [Public Law 98-237, Section 5(b)8]

Lumber products are, and have been historically, exempt from tariff filing requirements and, under the new legislation, do not have the

[19] At the suggestion of a referee, we examined the possible influence of multicollinearity. All pair-wise correlations were less than .7 in magnitude, except for the correlation between fuel and exchange rates, $\rho = .84$. We also examined the eigenvalues of the cross-product matrix (when Xs have unit length). The condition number ($\lambda_{max}/\lambda_{min}$) was 425, far less than the threshold value of 900 suggested by Belsley, Kuh, and Welsch. Finally, as a check of the stability of our coefficients, we dropped from each equation the variable with the lowest t-value. None of the results changed qualitatively and were remarkably similar in magnitudes to those reported. Results are available from the authors on request.

[20] Surcharges for fuel price changes (Bunker C fuel adjustment), exchange rate changes (currency adjustment factor), and container yard charges are reflected in the rate. Details on converting tariff rates to 40-foot equivalents and reflection of surcharges in the adjusted rates are available from the authors on request.

Table 1. Empirical Results

Independent Variable (logs)	Commodity				
	Apples	Fries	Hay	Onions	Lumber
Constant	16.634*	11.810*	15.903*	28.050*	7.467*
	(3.99)	(1.46)	(4.30)	(2.07)	(0.76)
Shipping Act	−1.142*	−0.199*	−0.290	−0.174	0.109*
	(0.395)	(0.085)	(0.209)	(0.124)	(0.028)
Capacity	−0.732**	−0.465*	−1.008*	−2.061*	−0.321*
	(0.414)	(0.164)	(0.406)	(0.266)	(0.101)
Residual Fuel	−0.187	0.077	0.681*	0.987*	0.012
	(0.382)	(0.112)	(0.254)	(0.223)	(0.055)
Exchange Rate	−1.622*	−1.179*	−1.641*	−2.565*	−0.585*
	(0.550)	(0.214)	(0.459)	(0.245)	(0.081)
R-Square[a]	.74	.69	.74	.89	.75
D.W.	1.11	0.901	1.090	1.380	0.84

Note: The standard errors are in parentheses; a single asterisk and double asterisks indicate significance at the 5% and 10% levels, respectively.

[a] The summary statistics are based on the initial OLS results. The standard errors are based on the Newey and West consistent covariance estimator.

right to independent action. Therefore, the right to differ from collusively agreed upon tariff rates is not available to liners pricing lumber products, and the major competitive intrusion of the Shipping Act on pricing is not present. Market power is enhanced by the stronger conference system. In contrast the MIA provisions are available on apple and fry shipments and, as discussed earlier, are used. While the significance of the Shipping Act cannot be directly attributed to the MIA provision, the direction and signs of the results in table 1 are consistent with lower carrier market power in selected markets and greater carrier market power in other markets. That independent actions are used extensively and may significantly reduce market power of a cartel is consistent with the observation that regularly scheduled liner service has a low percentage of variable costs. Thus, there is a significant incentive for individual members to depart from cartel rates.

The remaining differences are explained by a slightly different characterization of the market. Apple and fry shipments generally are refrigerated movements while hay and onions generally are dry movements. Refrigerated movements generally are thought to be fronthaul (i.e., the demand for refrigerated containers lies to the right of demand for dry containers) while dry movements generally are thought to be backhaul movements. In the context of the model of cartel pricing, the effect of fuel prices on rates in fronthaul markets is less than in backhaul markets (i.e., the fronthaul market may be up against a capacity constraint). In comparing the results across these two classes of commodities, differences are consistent with this prediction. Specifically, residual fuels are of the correct sign and significant in the backhaul market but insignificant in the fronthaul market. These results are consistent with commonly found cost-based pricing on backhaul markets and value-of-service pricing on fronthaul markets.

Of perhaps more interest are the effects of the Shipping Act. The effects of the Shipping Act are negative and statistically significant in the fronthaul market but not statistically significant in the backhaul market. These results are consistent with the proposition that backhauls are priced more in line with costs, while the conference capitalizes market power on the fronthaul.

Conclusions

In this article, we provided an overview of the Shipping Act of 1984 and evaluated its effects on market power and rates for selected agricultural commodities shipped off the U.S. West Coast to Pacific Rim countries. The Act represents an attempt to balance market power held by cartels involved in providing transportation in an international market against goals of reducing government intervention and regulatory costs. The Act streamlined the activities and limited the discretion of the FMC

in approving conference agreements and expanded antitrust immunity, each having a positive influence on market power. However, the Act also introduced new regulatory concepts which have negative influences on market power.

Not only is the effect of new legislation on the behavior of rates ambiguous, but basic market conditions (supply and demand factors) have changed before and after passage of the Act, complicating evaluation of the Act. These market effects were introduced into a reduced form for rates and empirically estimated. The results suggest that for all commodities, except lumber, the Shipping Act had a negative influence on rates, and the negative effects were significant for apples and fries which represent refrigerated fronthaul traffic for liners. The results were negative but not statistically significant for hay and onion products, commonly shipped in nonrefrigerated containers and representing backhaul traffic for liners. Since the Mandatory Right to Independent Action provision does not apply to lumber, those results are of particular interest. In that case the effect of the Shipping Act on rates was positive and significant, indicating that the Shipping Act has a positive and significant influence on rates. Our overall conclusion is that any increased market power from the new legislation is more than offset by the introduction of counterbalancing competitive provisions in selected markets, but in markets without these provisions, carrier market power is greater.

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