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ABSTRACT

Exclusive Contracts and Market Power: Evidence from Ocean Shipping*

There is a substantial theoretical literature on the potential effects of loyalty contracts, but a relative paucity of empirical work. This Paper employs the event study methodology to examine the effect of exclusionary contracts on firm performance in the ocean shipping industry. Shipping conferences – legal cartels exempt from antitrust laws – offered discounts to customers that patronized exclusively cartel member firms. The usage of these contracts was the subject of an extended legal and political struggle. We test for the impact of the most important events in this conflict on the stock returns of firms in the shipping industry. We find that some of these events resulted in significant changes in the firms' stock returns. Our evidence suggests that exclusive contracts may have contributed to market power in the shipping industry.

JEL Classification: K21, L12 and L42
Keywords: event study, exclusive contracts and shipping conferences

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NON-TECHNICAL SUMMARY

The use of exclusive contracts and other loyalty inducing instruments is one of the most controversial issues in competition policy. Despite the existence of a considerable theoretical literature, there is still much disagreement about the key question of whether exclusive contracts can indeed contribute to market power. In this Paper, we provide empirical evidence on the economic benefits that accrue to firms that employ exclusive contracts with the ultimate consumers of their product. Empirical studies of such contracts have been relatively neglected, perhaps because of the difficulty in obtaining detailed data on the types and numbers of consumers that do and do not sign such contracts. We circumvent these problems by applying the event study methodology to a particular case of regulation and litigation that dealt precisely with the issue of exclusive contracts.

Ocean shipping cartels have employed exclusive contracts for more than one hundred years. Non-cartel carriers and customers alike have often complained about their usage to regulatory authorities and the courts. Despite this, the ocean shipping industry generally is exempt from competition laws in Europe, the United States and elsewhere. What makes ocean shipping particularly amenable to analysis is that the cartel carriers have never denied that the motivation for employing exclusive contracts is to deter entry. They have simply argued that competitive entry is 'destructive' and that industry self-regulation ensures the survival of ocean shipping services. Because of the frankness with which the industry has asserted the anti-competitive purpose of exclusive contracts, we are able to focus on the measurement of their impact on firm profitability, rather than attempting to make the often very difficult distinction between efficiency explanations and those based on market power.

The event study is especially well suited to our particular objective. Event studies have been widely used in the literature to analyse the effects of regulation on firms' performance. The manner in which this is accomplished is by utilizing time series of stock prices and testing for the effects of specific regulatory events on stock returns. The implication is that a positive regulatory development will cause an 'abnormally' high return to occur immediately following the dissemination of the informational content of that event.

In our discussion of dual-rate contracts, we identified a period during which their very existence was called into question by several legal and political challenges. By examining the effect of major events during this period on the returns of securities of members of steamship conferences that employed dual-rate contracts, we effectively test whether dual-rate contracts contributed positively to firms' profitability. On the one hand, if, following an event that increased the probability that dual-rate contracts would be prohibited, we observe abnormally negative stock returns, then we can conclude that dual-

rate contracts improve the financial prospects of conference members. On the other hand, if security returns were not abnormal following such an event, this would be evidence supporting the hypothesis that dual-rate contracts did not exist for market power reasons.

In the United States, the ocean shipping industry was embroiled in an extended legal conflict during the 1950s, at the centre of which were exclusive contracting practices. In 1958, after years of litigation, the US Supreme Court ruled that exclusive contracts that reduced or eliminated competition in ocean shipping were illegal. A political struggle ensued, which was only resolved in 1961 with the passage of amendments to the Shipping Act that over ruled the Court's decision.

We examine the impact on ocean carriers' stock returns of several key events in this tumultuous period, each of which transmitted information specifically on the probability that exclusive contracts would be prohibited. The results provided in the paper suggest that loyalty (dual-rate) contracts positively affect firms' performance. The results indicate, however, that not all the events were statistically significant, and accordingly they should be taken cautiously. The best evidence is associated with the events Court1 (the dual-rate case is argued before US Court of Appeal, October 20, 1953) and Leg2 (a bill is introduced in Congress to permanently legalize dual-rate contracts, February 15, 1961). For Court1, carriers' stock returns were strongly negatively impacted, perhaps indicating investors' anticipation that the court would decide not to permit dual-rate contracts on the routes to Japan, and therefore prolonging the rate war in the Pacific. The strong positive coefficient on Leg2 suggests that investors believed that the introduction of the bill in Congress conveyed important information about the likelihood that dual rate contracts would be legalized permanently, and that they viewed this as a positive development for the shipping companies.

The results may actually underestimate the competitive impact of dual-rate contracts if firms were able to employ an alternative means of deterring entry that served as a close substitute. Recall that when deferred rebates were prohibited by the Shipping Act of 1916, against the strong protest of shipping conferences, dual-rate contracts were instituted shortly thereafter in American trades. In that regard, there is significant evidence that predatory pricing has been commonly employed against entrants in the shipping industry. The strategy of initiating a rate war, employed by members of the Japan Atlantic and Gulf Conference in 1953 and 1954, is consistent with that view. This strategy, however, was costly for the Conference firms, as was an inferior substitute tactic.

The use of exclusive contracts and other loyalty-inducing instruments is one of the most controversial issues in competition policy. Despite the existence of a considerable theoretical literature, there is still much disagreement about the key question of whether exclusive contracts can indeed contribute to market power.[1] Moreover, much of the literature has focused on exclusive dealing relationships between manufacturers and retailers, although these are but one example of loyalty-based pricing policies employed by firms.[2]

In this paper, we provide empirical evidence on the economic benefits that accrue to firms that employ exclusive contracts with the ultimate consumers of their product. Empirical studies of such contracts have been relatively neglected, perhaps because of the difficulty in obtaining detailed data on the types and numbers of consumers that do and do not sign such contracts. We circumvent these problems by applying the event study methodology to a particular case of regulation and litigation that dealt precisely with the issue of exclusive contracts.

Ocean shipping cartels have employed exclusive contracts for more than one hundred years. Non cartel carriers and customers alike have often complained about their usage to regulatory authorities and the courts. Despite this, the ocean shipping industry

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[1] For articles contending that such contracts can convey market power, see Philippe Aghion and Patrick Bolton, Contracts as a Barrier to Entry, 77 Am. Econ. Rev. 388 (1987); J. Mark Ramseyer, Eric B. Rasmusen and John S. Wiley, Naked Exclusion, 81 Am. Econ. Rev. 1137 (1991). For the opposing position, see Aaron Director and Edward H. Levi, Law and the Future: Trade Regulation, 51 Nw. U. L. Rev. 281 (1956); Robert Innes and Richard J. Sexton, Strategic Buyers and Exlusionary Contracts, 84 Am. Econ. Rev. 566 (1994).

[2] The literature on exclusive dealing in this regard is voluminous. See Howard P. Marvel, Exclusive Dealing, 25 J. Law & Econ. 1 (1982); Stanley I. Ornstein, Exclusive Dealing and Antitrust, 34 Antitrust Bull. 65 (1989); Jan B. Heide, Shantanu Dutta and Mark Bergen, Exclusive Dealing and Business Efficiency: Evidence from Industry Practice, 41 J. Law & Econ. 387 (1998); Margaret E. Slade, Beer and the Tie: Did Divestiture of Brewer-Owned Public Houses Lead to Higher Beer Prices?, 108 Econ. J. 565 (1998); Douglas B. Bernheim and Michael D. Whinston, Exclusive Dealing, 106 J. Pol. Econ. 64 (1998). Whereas it is acknowledged that exclusive dealing may be efficiency-enhancing, this literature is also inconclusive about the contracts' net effects.

generally is exempt from competition laws in Europe, the United States and elsewhere. What makes ocean shipping particularly amenable to analysis is that the cartel carriers have never denied that the motivation for employing exclusive contracts is to deter entry. They have simply argued that competitive entry is "destructive" and that industry self-regulation ensures the survival of ocean shipping services. Because of the frankness with which the industry has asserted the anti-competitive purpose of exclusive contracts, we are able to focus on the measurement of their impact on firm profitability, rather than attempting to make the often very difficult distinction between efficiency explanations and those based on market power.

The event study is especially well suited to our particular objective. In the United States, the ocean shipping industry was embroiled in an extended legal conflict during the 1950s, at the center of which were exclusive contracting practices. After years of litigation, the U.S. Supreme Court, in 1958, ruled that exclusive contracts that reduced or eliminated competition in ocean shipping were illegal.[3] A political struggle ensued, which was only resolved in 1961 with the passage of amendments to the Shipping Act that over-ruled the court's decision.

We examine the impact on ocean carriers' stock returns of several key events in this tumultuous period, each of which transmitted information specifically on the probability that exclusive contracts would be prohibited. We find that some events, but not all, resulted in significant changes in the market's evaluation of these firms' prospects. More precisely, our evidence suggests that exclusive contracts indeed contributed to market power in the ocean shipping industry.

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[3] Federal Maritime Board v. Isbrandtsen Co., Inc., et al., 356 U.S. 481 (1958).

Economic Literature on Loyalty Contracts

One of the first contributions related to loyalty contracts is that of Director and Levi.[4] Posner[5], and later Bork[6], developed their position further. These authors maintain that contracts are not a useful device to deter entry. They argue that firms will have to compensate customers fully for their exclusive patronage and thus the price, after the loyalty discount, is equal to the competitive price.

Aghion and Bolton develop a model in which an incumbent monopolist offers a contract price and also sets a penalty for breaking the contract.[7] Successful entrants need to fix a price below or equal to the monopolist's contract price. They demonstrate that when there is uncertainty about the marginal cost of the potential entrant, the monopolist can deter entry totally by setting a high enough penalty, while maintaining a price above the competitive level.

Ramseyer, Rasmusen and Wiley[8] provide another example of how exclusive contracts can result in supra-competitive prices. In their model, both the monopolist and the potential entrant face a decreasing average cost function up to some capacity, the minimum efficient scale, and constant average (and marginal) costs beyond that point. Accordingly, entry will occur only if the aggregate demand of those customers not signing the loyalty contract exceeds the minimum efficient scale. In equilibrium, assuming there is

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[4] Director and Levi, *supra* note 1.
[5] Richard A. Posner, Antitrust Law: An Economic Perspective (1976), at 202-205.
[6] Robert Bork, The Antitrust Paradox: A Policy at War with Itself (1978), at 325-28.
[7] Aghion and Bolton, *supra* note 1.
[8] Ramseyer, Rasmusen and Wiley, *supra* note 1.

no coordination among consumers, the monopolist only needs to offer a small discount from the monopoly price in order to deter entry. All customers will sign the contract since they know that the monopolist can deter entry by attracting enough loyal customers such that the remaining demand is not large enough to induce entry. In that case, customers who do not sign pay the monopoly price, while signatories pay a slightly smaller price. In order for loyalty contracts to deter entry, the only important assumptions required are that customers cannot coordinate and that there are increasing returns to scale for some levels of production.[9]

Several other recent contributions, with different approaches, also have taken the position that loyalty contracts can indeed exclude lower cost entry. Klemperer[10] views loyalty contracts, even of a weak variety, such as airlines' frequent flier programs, as a type of "artificial switching cost" that raises prices above what would obtain had such contracts not been introduced. Finally, Sjostrom[11] and Yong[12] have modeled the use of loyalty contracts in ocean transport. They both conclude that if entrants are capacity-constrained, these devices can serve as a barrier to entry.

Loyalty Contracts in the Ocean Shipping Industry

Since the late nineteenth century, ocean carriers have organized cartels known as shipping conferences. In Europe, Regulation 4056/86 grants shipping conferences a block

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[9] Innes and Sexton, *supra* note 1, show that loyalty contracts are generally efficient when consumers can act strategically and form coalitions.
[10] Paul Klemperer, The Competitiveness of Markets with Switching Costs, 18 Rand J. Econ. 138 (1987).
[11] William Sjostrom, Monopoly Exclusion of Lower Cost Entry, 22 J. Trans. Econ. & Pol. 339 (1988).
[12] Jong-Say Yong, Excluding Capacity-Constrained Entrants through Exclusive Dealing: Theory and an Application to Ocean Shipping, 44 J. Ind. Econ. 115 (1996).

exemption from Article 85(1) of the Treaty of Rome. In the United States, the Shipping Act requires that conferences submit their agreements to the Federal Maritime Commission and that, if approved, the members may engage in price and quantity fixing. Conferences are organized by route; for example, there may exist one conference covering trade between Northern Europe and the Pacific ports of the U.S. and another covering trade between Northern Europe and U.S. Gulf ports. In addition, firms do not always participate in conferences on all the routes they serve, although this was much more the case in the 1950s, the period of our analysis, than the present. Conferences are very heterogeneous in their structure and membership. Table 1 illustrates that most conferences in the 1950s had fewer than eleven members.

From their origins, conferences have offered loyalty contracts to their customers. The first of these to gain wide use was the deferred rebate -- an instrument still applied by conferences in non-U.S. trades.[13] Under this system, customers who patronize conference members exclusively for six months receive a rebate, usually equal to 10% of the freight rate paid. This rebate is paid in two parts. The first half is paid after an additional six months of exclusive patronage, and the second, after yet another six-month period of loyalty. This type of contract was the subject of intense scrutiny by both the British and U.S. governments in the early part of this century. At the conclusion of a multi-year investigation, the United Kingdom's Royal Commission on Shipping Rings concluded that the deferred rebate was essential to prevent the cutthroat competition of tramp steamers. In

[13] Article 5(2) of the aforementioned European Regulation 4056/86 permits both deferred rebates and dual rate contracts, but mandates that conferences offer exporters a choice between the two. In addition, the regulation includes certain safeguards, the most significant of which is that exporters are "released from their obligation of loyalty" if they would have to wait for a conference vessel for an inordinate amount of time.

the United States, however, Congress prohibited deferred rebates in the U.S. Shipping Act of 1916.

Subsequently, many conferences in U.S. trades began to use dual-rate contracts in order to inspire customer loyalty. Under this device, conferences charge two separate rate structures, contract and non-contract rates. Those customers who sign dual-rate contracts with the conference pay the lower contract rate. Table 2 illustrates the frequency distribution of the spread between contract and non-contract rates by conferences in 1958. If a customer who signs such a contract violates its terms by shipping cargo on a non-conference vessel, it must pay liquidated damages. The most common damages were equal to the charges that would have been paid had the client shipped at contract rates with the conference.[14] It was not unusual if the penalty was a multiple of this contract rate. It is evident that dual-rate contracts are very much in the spirit of those contracts characterized in theories we discussed previously.

Substantial anecdotal evidence suggests that conferences used dual-rate contracts to prevent entry. For example, during the congressional investigations of shipping conferences in the late 1950s and early 1960s, documents obtained from the largest U.S. shipping company contained an admission that "the entire contract system is a fighting measure to get rid of outside competition."[15] Even the head of the Federal Maritime Board, the regulatory agency charged with policing the conference system, stated that "the purpose and intent of the a dual-rate system is to drive out non-conference competition."[16] Conferences frequently argued that dual-rate contracts were necessary to prevent destructive

[14] For a more detailed description of the contract terms, see U.S. House Subcomm. on Antitrust, 87th Cong., 2nd Sess., The Ocean Freight Industry (1962), at 189-209.
[15] U.S. House Subcomm. on Antitrust, The Ocean Freight Industry, p. 216.

competition, and that they are essential to promote rate stability and regular service.[17] Pirrong[18] and Sjostrom[19] maintain that the liner shipping industry is characterized by an "empty core" -- the absence of a competitive equilibrium. They believe that cartels are a necessary and efficient response to this problem. Their position echoes the informal arguments made by executives of shipping corporations for more than one hundred years.[20] Nevertheless, we do not aim to test whether conferences are socially beneficial or not, but only whether loyalty contracts are capable of enhancing conference firms' performance by acting as a barrier to entry.

The basis for our empirical investigation flows from an intense legal and political struggle over the use of dual-rate contracts in ocean shipping that took place in the United States after World War II. In 1958, the Supreme Court ruled that conferences' use of dual-rate contracts was illegal if it had the effect of eliminating competition. Three years later, Congress approved legislation definitively legalizing dual-rate contracts without regard to competitive considerations.

In the 1950s, approximately one-half of steamship conferences in American trades offered dual-rate contracts.[21] According to statistics compiled in 1959, in trans-Atlantic trades, more than 37,000 exporters were signatories of such contracts. More than 60,000

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[16] Ibid.
[17] See U.S. Senate Comm. on Commerce, 87th Cong., 1st Sess., Steamship Conferences and Dual-rate Contracts (1961), at 204, 209. Also see U.S. House Subcomm. on Antitrust, The Ocean Freight Industry, pp. 216-22.
[18] Stephen C. Pirrong, An Application of the Core Theory to the Analysis of Ocean Shipping Markets, 35 J. Law & Econ. 89 (1992).
[19] William Sjostrom, Collusion in Ocean Shipping: A Test of Monopoly and Empty Core Models, 97 J. Pol. Econ. 1160 (1989).
[20] For examples, see U.S. House Comm. on Merch. Marine & Fisheries, Report; U.S. House Subcomm. on Antitrust, *supra* note 14.
[21] Congressional Record, September 13, 1961, at 18167-68.

such contracts were in effect in U.S. - Latin American trades, and over 20,000 in U.S. - Asian commerce.[22]

The controversy over dual rate contracts largely stemmed from the persistent legal complaints levied by an independent, non-conference carrier, Isbrandtsen Co., against conferences' use of dual-rate contracts.[23] The most controversial case involved shipping between the United States and Japan. By the early 1950s, Isbrandtsen had achieved a market share on the Japan - Atlantic and Gulf Freight routes of approximately thirty percent.[24] Late in 1952, the Japan - Atlantic and Gulf Freight Conference announced its plan to introduce a dual-rate contract system in order to fight the non-conference carrier's gains. Isbrandtsen complained to the F.M.B. The Department of Justice joined Isbrandtsen in its complaint. In January 1953 the F.M.B. decided to permit the dual rate contract to be implemented on an interim basis while the agency conducted a full investigation of the conference's application. Isbrandtsen then petitioned the courts for relief. The U.S. Court of Appeals ruled in Isbrandtsen's favor, stating that the Shipping Act did not permit any interim approvals, and that the F.M.B. could only allow the conference to implement the dual rate contract system after making a formal ruling.

The decision meant that the Japan – Atlantic and Gulf Freight Conference would have to operate in open competition with Isbrandtsen for the foreseeable future (the F.M.B. investigation would be lengthy). The conference lines initiated a rate war in 1953, especially targeting Isbrandtsen, which continued through 1954. Profits fell dramatically

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[22] *Id.*, at 18176; U.S. House Subcomm. on Antitrust, *supra* note 14, at 186.
[23] In these cases, Isbrandtsen was joined by the U.S. Department of Agriculture, as an interested shipper, and the U.S. Department of Justice.
[24] Federal Maritime Board v. Isbrandtsen, Inc. 356 U.S. 481, at 485 (1958).

for all lines in 1953 and 1954, with Isbrandtsen losing between 2 and 3 million dollars each year. The conference carriers saw their profits on the route cut by more than fifty percent.[25]

After a lengthy investigation, the F.M.B. formally approved the system in 1956. Isbrandtsen appealed to the courts, and on November 9, 1956, the Court of Appeals set aside the F.M.B.'s decision.[26] On March 25, 1957, the Supreme Court announced that it would hear the case, which was argued on December 11 of that year. On May 19, 1958, the Court decided that dual-rate contracts that eliminated or curtailed competition were illegal.[27] That same day, the conferences' political allies in Congress introduced legislation to legalize dual-rate contracts for a period of two years, during which time Congress would investigate the issue. This legislation did not encounter serious opposition and was enacted in August 1958.[28]

Both the House Committee on Merchant Marine and Fisheries and the Antitrust Subcommittee of the House Judiciary Committee conducted investigations during 1959 - 1960. Much to the relief of industry, on February 15, 1961 a bill was introduced in Congress that would legalize dual rate contracts permanently. Under intense pressure from Judiciary Committee chairman Emanuel Celler and the Department of Justice, the House Merchant Marine and Fisheries Committee, on May 4, 1961, reported a bill that would have prohibited any dual-rate contract that had the effect of eliminating competition. With the support of the committee, the bill's passage in the House was not in doubt and it was approved easily one month later.[29]

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[25] U.S. House Subcomm. on Antitrust, Monopoly Problems in Regulated Industries, pp. 692, 703-704, 714.
[26] Isbrandtsen Co., Inc., et al. v. Federal Maritime Board, 99 U.S. App. D.C. 312, 239 F.2d. 933 (1956).
[27] Federal Maritime Board v. Isbrandtsen Co., Inc., et al., 356 U.S. 481, at 500 (1958).
[28] The interim legislation was later extended to 1961.
[29] The House passed the bill by voice vote. See Congressional Record, June 12, 1961, at 9372.

The legislation moved to the Senate, where another furious lobbying campaign ensued. Here the Commerce Committee had jurisdiction, and it reported a bill in late August that deleted the antitrust safeguards included in the House version. Senate Judiciary Committee chairman Estes Kefauver immediately denounced the bill, and vowed to offer amendments on the floor that would reverse the Commerce committee's changes. Kefauver's amendments were defeated, however, and the Commerce Committee's version was passed, with only minor adjustments, the following week.

House and Senate conferees approved the Senate version, which was adopted by both chambers in the last week of September. There was considerable speculation about whether President Kennedy would veto the bill. Yet, on September 29, the White House signaled that the president would not veto, and the bill became law in early October.

This chronology contains numerous events that conveyed information about the probability that dual-rate contracts would be prohibited. These events will be critical in our test of whether dual-rate contracts did contribute to firm profitability. Most importantly, the controversy pivoted directly on the key theoretical point of debate in the literature - whether such contracts can indeed eliminate competition.

Methodology

Although first utilized by Fama, Fisher, Jensen, and Roll[30] to test the efficient market hypothesis, since then event studies have been widely used in the literature to

[30] Eugene F. Fama, Lawrence Fisher, Michael Jensen, and Richard Roll, The Adjustment of Stock Prices to New Information, 10 Intl. Econ. Rev. 1 (1969).

analyze the effects of regulation on firms' performance.[31] The manner in which this is accomplished is by utilizing time series of stock prices and testing for the effects of specific regulatory events on stock returns. The implication is that a positive regulatory development will cause an "abnormally" high return to occur immediately following the dissemination of the informational content of that event.

In our discussion of dual-rate contracts, we identified a period during which their very existence was called into question by several legal and political challenges. By examining the effect of major events during this period on the returns of securities of members of steamship conferences that employed dual-rate contracts, we effectively test whether dual-rate contracts contributed positively to firms' profitability. On the one hand, if, following an event that increased the probability that dual-rate contracts would be prohibited, we observe abnormally negative stock returns, then we can conclude that dual-rate contracts improve the financial prospects of conference members. On the other hand, if security returns were not abnormal following such an event, this would be evidence supporting the hypothesis that dual-rate contracts did not exist for market power reasons.

In order to execute this test we estimate the following regression equation:

(1) $$R_{it} = \alpha + \beta R_{mt} + \gamma_k D_k + u_{it}$$

[31] For a survey and discussion, see G. William Schwert, Using Financial Data to Measure Effects of Regulation, 24 J. Law & Econ. 121 (1981). Also see George L. Mullin, Joseph C. Mullin and Wallace P. Mullin, The Competitive Effects of Mergers: Stock Market Evidence from the U.S. Steel Dissolution Suit, 26 Rand J. Econ. 314 (1995); Sara Fisher Ellison and Wallace P. Mullin, Economics and Politics: The Case of Sugar Tariff Reform, 38 J. Law & Econ. 335 (1995); John J. Binder, Measuring the Effects of Regulation with Stock Price Data, 16 Rand J. Econ. 167 (1985).

where R_{it} denotes either firm i's stock return in period t or the return on a portfolio of stocks, R_{mt} is the market return in period t, D_k are dummy variables related to the event, and u is an error term with zero mean and finite variance.[32] The inclusion of the market return, R_{mt}, will allow us to isolate the fluctuations caused specifically by the event. Notice that the inclusion of R_{mt} also implies that the error term is distributed as white noise under the null hypothesis that R_{it} and R_{mt} are co-integrated.

An alternative estimation procedure, used for example by Mullin, Mullin and Mullin,[33] is based upon the Capital Asset Pricing Model (CAPM). Recent critiques of the use of this model for event studies suggest that the results are sensitive to the particular restrictions implied by this model.[34] Therefore we proceed with the standard market model specified in equation (1).

Clearly the validity of such tests depends upon a careful selection of events. First, if other important occurrences took place simultaneously with the selected events, the results will be severely biased. In order to avoid this pitfall, we examined the key U.S. periodical that covers the shipping industry, the Journal of Commerce. We eliminated any potential legal or legislative events that coincided with other events of importance in the industry or to specific firms, such as dividend announcements and news about merger discussions.

Second, the event study method will not detect significant abnormal returns if the events of interest were anticipated long in advance or their impact was not fully realized until much later. We tried two approaches to address this issue. First, we studied different

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[32] See A. Craig MacKinlay, Event Studies in Economics and Finance, 35 J. Econ. Lit. 13 (1997), for an extensive review and discussion of the literature.
[33] Mullin, Mullin & Mullin, *supra* note 31.
[34] Eugene Fama and Kenneth French, Multifactor Explanations of Asset Pricing Anomalies, 51 J. Fin. 55 (1996), discuss extensively this problem. See also MacKinlay, *supra* note 32.

event windows; in particular, one, three and five week event windows centered on the event. A one week event window corresponds to a D_k with value equal to unity for the week when event k takes place and zero otherwise, three and five week event windows set D_k equal to unity also for one or two weeks before and after the event actually occurred.

Next, we estimated the dissemination of information about the event in a more flexible specification, which permitted us to estimate jointly the differential flow of information throughout the event window. To allow for flexible effects we introduce three related variables with values different from zero during the event window. Accordingly we substitute $\gamma_k D_k$ in equation (1) by $\gamma_{1k} D_{1k} + \gamma_{2k} D_{2k} + \gamma_{3k} D_{3k}$, where D_{1k} is set equal to one for the weeks in the event window and zero otherwise, $D_{2k} = t\ D_{1k}$, where t is a trend variable centered on the event, i.e., with zero value the week of the event, negative values before the event and positive values after the event, and finally, $D_{3k} = t^2\ D_{1k}$. This means that D_{1k} measures the unanticipated shift effect due to the event, which can be either positive or negative. D_{2k} measures if the effect of the event has been increasing or decreasing with time during the event window, and D_{3k} determines non linear effects. By observing the sign and significance of these dummy variables separately we can characterize better the dissemination of information for each event, and by analyzing their joint significance we can assess the overall effect of the event. We apply this methodology to five week event windows either centered around the week of the event.

Data

We collected weekly stock prices from *Barron's* for five U.S. steamship companies listed on the New York Stock Exchange for the period January 1950 to July 1962.[35] These companies are U.S. Lines, Moore-McCormack, American Export Lines, Lykes Brothers Steamship Co., and Natomas (parent company of American President Lines).[36] Table 3 shows the number of conferences where each of these firms was participating and the number of those that employed dual-rate contracts. Moore-McCormack participated almost exclusively in conferences using dual-rate contracts. The other lines also were members of conferences with dual-rate contracts, but in a lower proportion. These five firms were large American steamship corporations that participated in conferences on all of the routes where they were active. Therefore, it is logical to conclude that they had a considerable stake in the dual-rate system to the extent it supported the conference system. Unfortunately, we do not have more detailed data that would permit us to more precisely determine the extent to which these firms depended upon revenues from the "dual-rate routes." Nonetheless, anecdotal evidence suggests that U.S. Lines, Lykes and Moore-McCormack especially depended upon such routes. Moreover, the American lines that make up our sample were among the highest cost lines in the industry. It was widely held among industry experts and trade publications that if dual-rate contracts would be abolished, they would suffer the consequences disproportionately.[37]

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[35] Stock prices were collected for the final trading day of each week.

[36] Natomas also was involved in gold-dredging. We performed the estimations with indices that did not include Natomas. It did not materially affect the results. The data for Lykes and Natomas (American President Lines) were not available until the latter half of the period of analysis.

[37] See, for example, the comments of Senator Estes Kefauver in U.S. Senate, 87th Cong., 2nd Sess., Index to

We also collected weekly stock prices from the *London Times* for four British firms with interests in U.S. trades: Cunard Line, Peninsular and Oriental Steamship Co., Furness-Withy Co., and Royal Mail Lines. Table 3 shows that these companies operated mainly U.S. trade and how much they depended on dual rate contracts. Cunard proportionally depended the most on the U.S. market, but also the other firms depended on dual-rate contracts.

We would have liked to be able to obtain stock returns for independent, non-conference carriers as well. If the hypothesis that exclusive contracts contributed to market power were correct, the prohibition of their use would have had a positive impact on independent carriers' stock returns. Unfortunately, with the exception of the firms discussed above, none were publicly traded. They either tended to be closely held, often dominated by a single individual or family (like Isbrandtsen), or wholly owned by a large conglomerate. In addition, it is logical that any market power achieved by the conferences would have an impact on customers. Yet, transportation is a very small fraction of total costs for most goods carried by liner firms. Therefore, it is not practicable to test the market power hypothesis by examining the stock returns of exporters and importers.

We calculated weekly stock returns, corrected for stock dividends for each of the sample firms. From these data we constructed two equally weighted indices: one consisting of the five U.S. firms and another of the four British firms.

The choice of an appropriate market index is an important element of event studies. For the U.S. index, we employ *Standard and Poor's* composite index, the broadest based weekly portfolio available, and the London Stock Exchange index as reported in the *Globe*

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the Legislative History of the Steamship Conference/Dual-rate Law (1962), at 295. Cited from Congressional

and Mail. The inclusion of these indices will correct for the impact of economy wide movements on the shipping firms' stock returns.

The events that we selected are shown in table 4. The first four are important steps in the legal proceedings while the final four are the most important legislative developments. Table 4 also presents the expected sign for each event under the hypothesis that dual-rate contracts did indeed bestow additional profitability to the sample firms and that the event was not fully anticipated. The signs for three of the judiciary events are a priori uncertain. Two (Court1 and Court3) are the dates on which cases were argued in court. If the courtroom arguments and questions from the bench did not reveal any information about the probable outcome, the coefficients associated with these events should not be significantly different from zero. If, on the other hand, investors were able to glean information from the arguments, the coefficients should be significant and negative, as both decisions went against conferences' use of dual rate contracts. Conversely, if investors were misled by the arguments, the coefficient should be significant and positive. Finally, even if investors did correctly anticipate the legal outcome, the coefficients would be insignificant if investors did not believe that dual rate contracts contributed to firm performance.

The legal decision embodied by Court 4 is complicated by the occurrence of other important events with countervailing effects unavoidably in the event window. Recall that as soon as the Supreme Court announced its decision against dual rate contracts, representatives in Congress offered a bill that would overturn the court's decision. In

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Record, September 13, 1961, at 18168.

addition, important announcements relating to U.S. government maritime subsidies were also made in the days and weeks surrounding the event.

Although there are no such ambiguities about the signs for the legislative events, some further comment is merited. Two events that occurred simultaneously with the dual rate contracts controversy also had potential effects on the shipping industry – particularly the American carriers. There were severe labor problems plaguing U.S. ports from the late spring through the summer, and ongoing labor negotiations were being monitored very closely. Events associated with the labor difficulties may affect the estimation and interpretation of coefficients Leg3 and Leg4. Second, also in late spring, President Kennedy announced a plan to re-work the maritime bureaucracy in the United States that was widely perceived as detrimental to U.S. shipping companies. Specifically, the status quo before Kennedy's reorganization plan was that the government agency responsible for regulating the industry (the Federal Maritime Board) and policing the shipping conferences was very closely affiliated with the one responsible for administering subsidies and ensuring the health of U.S. merchant marine. The performance of the Federal Maritime Board had been, in the words of a House Judiciary Committee report, "a study in desultory regulation."[38] The Kennedy plan, which went into effect, more clearly separated the agencies, which suggested that the existing regulations might be enforced with more vigor. A steady stream of events relating both to the labor difficulties and the maritime reorganization inhibit our ability to isolate the impact of the events specifically dealing with the question of dual rate contracts.

Results

We estimate equation (1) for different specifications of the event window. In all cases we use the equally weighted shipping index for the U.K. and the U.S. as the dependent variables and the composite indices for the market portfolio return, R_{mt}. This index measures relevant factors that affect the evolution of the economy during the period under study but are independent from the events related to the specific maritime regulation. The equations for U.K. and U.S. are estimated applying the seemingly unrelated regression estimation method, that allows for the covariance of the residuals to be distinct from zero. In addition, we tested each the residuals from each equation for a unit root using the approach of Dickey and Fuller. Each series was integrated of order zero.

Index Regressions

Table 5 presents the results assuming only one dummy variable for each event, and allowing for different event windows; in particular, one, three and five week event windows centered on the week of the event.[39] Results are quite robust to changes in the length of the window. Table 6 analyzes the dissemination of information throughout the event window. In this case we consider five week event windows and three variables are included for each event. As previously explained, variable 1 corresponds to a shift and determines the sign of the effect, variable 2 determines if the effect was increasing or decreasing throughout the event window and variable 3 controls for non linear effects.

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[38] U.S. House Subcomm. on Antitrust, The Ocean Freight Industry, p. 321.

[39] We also tried alternative specifications with event windows centered around one or two weeks before or after the events but the results were less satisfactory.

For all three specifications, the coefficient of Court 1 shows a large and significant negative effect on the U.S. index on the weeks when the dual rate case was argued before the U.S. Court of Appeals. The magnitude of the coefficient in each specification implies a fall of about eleven percentage points in the index as a consequence of the event. The expected sign of this coefficient was a priori ambiguous since it was determined by the perception that the market had about the case. These results are consistent with those presented in table 6, where Court 1 has a negative impact for the U.S. index that was strongest the week of the event. Court 2 is related to the resolution of the case when the U.S. Court of Appeals ruled for Isbrandtsen and against the dual-rate system. Its coefficient is not significant either for any of the three specifications in table 5, nor in table 6. These two results together seem to imply that the court's decision was fully anticipated. Also, it is not surprising that this decision had no discernible effect on the U.K. index - none of the British sample firms participated in that route.

The coefficients associated with Court 3 are Court 4 are not significant for any of the three specifications in table 5. However, Court 4 has a positive and significant effect for the U.S. as measured by the joint significance of the three variables related to the event in table 6. Recall that we had no a priori opinion on whether these variables would have a negative or positive sign. Court 3 corresponds to the week during which the Isbrandtsen case was argued in front of the Supreme Court, a significant sign would imply that the market anticipated the final decision. Court 4 corresponds to the Supreme Court's decision in the Isbrandtsen case prohibiting dual-rate contracts on May 19, 1958, but the positive sign of the coefficient suggest that the introduction of a bill to permanently legalize dual-rate contracts on the same day was interpreted by the market as an indication that Congress

was likely to end the period of regulatory uncertainty that had plagued the industry for some years. It is interesting to note that the shift effect is positive but decreasing with time so that the peak effect occurs in the weeks before the decision of the Supreme Court was announced. It is possible that there was more uncertainty about this decision than about the introduction of the bill. Accordingly, we could interpret this result as an initially positive effect that was reconsidered when the Court's decision was made public. Alternatively, the market's reaction could have been most influenced by the anticipation of subsidies that were announced the same week as the court decision.

The coefficient for Legislative 1 is negative and significant as expected for the U.K. in table 6 and for a three week event window in table 5. This variable corresponds to the week when the House Antitrust Subcommittee concludes that the conferences have abused position and calls for extended investigation and hearings on the dual-rate system. The coefficient for Legislative 2 is positive and significant as expected for the U.S. index (all windows in table 5 and table 6) and U.K. (three week window and table 6) and corresponds to the introduction in Congress of a bill that would legalize dual-rate contracts permanently. According to table 6 the effects of these two variables are peaking during the week of the event and their effect is neither increasing nor decreasing monotonically during the event window.

The coefficient for Legislative 3 is negative and significant as expected, but only for the U.K. index. The lack of significance for the U.S. index may be explained by concurrent events associated with labor problems and/or the bureaucracy reorganization plan. Table 6 shows that there is not significant trend throughout the event window.

Finally, the coefficient of Legislative 4, that was expected to be positive, is not significant according to table 5. The joint test for the three variables, in table 6, indicates significance for the U.K., but the coefficient on variable 1 is not even significant in that case. This event corresponds to the week when President Kennedy signed the bill approved by the House and Senate. The lack of significance here does not lend support to theories of market power, but it may be explained by the same forces we discussed in conjunction with Leg3. Further, it may have simply been the case that the only new information was conveyed by event Leg2, and that investors had fully anticipated the bill's passage from that point in time.

Regressions on Returns of Individual Firms

Because the individual firms the composed the respective indices depended to differing degrees on the shipping conferences that employed dual rate contracts, we conducted additional estimations in order to test the hypothesis that those firms that depended more on dual rate contracts would be affected more by the most important legal and legislative events. The previous results indicate that for the U.S. firms, Court1 and Leg2 were the two most important events. For British firms, Leg1 was the most important event. In table 7 we present the regression results for the individual firms for these events.

The only measure of reliance on exclusive contracts available to us is that presented in table 3. Each firm was a member of many conferences, and an imperfect measure of their dependence on exclusive contracts is the percent of these conferences that employ dual rate contracts. According to this measure, the U.S. firms depended on exclusive contracts in the following order: Moore-McCormack, U.S. Lines, Lykes, American Export Lines and

American President Lines. Moore-McCormack participated in a much higher percentage of conferences that utilized dual rate contracts than the other firms. The results of the individual firm regressions for the event Leg2 (table 7A) bear this out quite well. The coefficients for Moore-McCormack are large and statistically significant in every specification, and are especially so for the one week specification. U.S. Lines and American President Lines also perform quite well, but to a lesser degree.

When analyzing Court1, it is important to keep in mind that this legal case involved a specific conference, and U.S. Lines was a member of the conference and a direct participant in the suit. Further, the legal process was at a sufficiently early stage that there might have existed substantial uncertainty as to whether the legal opinion of the court would be applied generally to exclusive contracts or specifically to those on the disputed routes. The results presented in table 7B are entirely consistent with this information – the coefficient for U.S. Lines are larger and more statistically significant than the coefficients for either Moore-McCormack and American Export Lines, the other two firms for which we have data during this period. [40]

Insofar as the British firms, according to our measure Cunard relied the most on exclusive contracts in U.S. trades, followed by Royal Mail, Furness, and Peninsular and Oriental, which depended on the contracts to a much lesser degree than the others. Table 7C shows that the coefficients for Cunard are significant in three of the four specifications and the magnitudes of the expected effect of the event on Cunard's stock return are also the largest in all but one specification. Furness also performs well, but both Royal Mail and Peninsular and Oriental exhibit virtually no impact of the event. In total, the individual

[40] Our data for American President Lines and Lykes do not begin until after this event takes place, so they are

level regressions augment the index results by showing that the events in question affected more profoundly the firms that had the most to lose from the prohibition of exclusive contracts.

Conclusions

Loyalty contracts are one of the main features that have characterized the shipping industry for the last one hundred years. Several theoretical contributions have shown the potentially strong anti-competitive effects of these practices. In this paper we apply the event study methodology to study the evolution of firms' returns during the 1950s, a period of regulatory instability in the industry.

The results provided in the paper suggest that loyalty (dual-rate) contracts affect positively firms' performance. However, the results indicate that not all the events were statistically significant, and accordingly they should be taken cautiously. The best evidence is associated with the events Court1 and Leg2. For Court1, the U.S. index was strongly negatively impacted, perhaps indicating investors' anticipation that the court would decide not to permit dual rate contracts on the routes to Japan, and therefore prolonging the rate war in the Pacific. The strong positive coefficient on Leg2 suggests that investors believed that the introduction of the bill in Congress conveyed important information about the likelihood that dual rate contracts would be legalized permanently, and that they viewed this as a positive development for the shipping companies.

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omitted from the table.

The results may actually underestimate the competitive impact of dual-rate contracts if firms were able to employ an alternative means of deterring entry that served as a close substitute. Recall that when deferred rebates were prohibited by the Shipping Act of 1916, against the strong protest of shipping conferences, dual-rate contracts were instituted shortly thereafter in American trades. In that regard, there is significant evidence that predatory pricing has been commonly employed against entrants in the shipping industry.[41] The strategy of initiating a rate war, employed by members of the Japan Atlantic and Gulf conference in 1953 and 1954, is consistent with that view. However, this strategy was costly for the conference firms, as was an inferior substitute tactic.

[41] For evidence of the use of predatory pricing in ocean shipping, see B.S. Yamey, Predatory Price Cutting: Notes and Comments, 15 J. Law & Econ. 129 (1972); Fiona Scott Morton, Entry and Predation: British Shipping Cartels, 1879-1929, 6 J. Econ. & Mgmt. Strat. 679 (1997); U.S. House Subcomm. on Antitrust, *supra* note 14, at 285-298.

Bibliography

Aghion, Philippe, and Bolton, Patrick. "Contracts as a Barrier to Entry." *American Economic Review* 77, No. 3 (June 1987): 388-401.

Barron's, various issues.

Bernheim, Douglas, and Whinston, Michael. "Exclusive Dealing." *Journal of Political Economy* 106, No. 1 (Feb. 1998): 64-103.

Binder, John. "Measuring the Effects of Regulation with Stock Price Data." *Rand Journal of Economics* 16, No. 2 (Summer 1985): 167-83.

Bork, Robert H. *The Antitrust Paradox: A Policy at War with Itself*. New York: Basic Books, 1978.

Bridges, Roland K. *Freight Conferences and Rebate Terms*. New York: Croner Publications, Ltd., 1961.

Congressional Record, various volumes.

Director, Aaron and Levi, Edward H. "Law and the Future: Trade Regulation." *Northwestern University Law Review* 51, No. 2 (May-June 1956): 281-96.

Ellison, Sara Fisher and Mullin, Wallace. "Economics and Politics: The Case of Sugar Tariff Reform." *Journal of Law and Economics* 38, No. 2 (Oct. 1995): 335-66.

Fama, Eugene; Fisher, Lawrence; Jensen, Michael; and Roll, Richard. "The Adjustment of Stock Prices to New Information" *International Economic Review* 10, No. 1 (Feb. 1969): 1-21.

Fama, Eugene and French, Kenneth. "Multifactor Explanations of Asset Pricing Anomalies," *Journal of Finance* 51, No. 1 (March 1996): 55-84.

Globe and Mail, various issues.

Heide, Jan B.; Dutta, Shantanu; and Bergen, Mark. "Exclusive Dealing and Business Efficiency: Evidence from Industry Practice." *Journal of Law and Economics* 41, No. 2 (Oct. 1998): 387-407.

Innes, Robert and Sexton, Richard. "Strategic Buyers and Exclusionary Contracts." *American Economic Review* 84, No. 3 (June 1994): 566-84.

Journal of Commerce and Commercial, various issues.

Klemperer, Paul. "The Competitiveness of Markets with Switching Costs." *Rand Journal of Economics* 18, No. 1 (Spring 1987): 138-50.

MacKinlay, A. Craig. "Event Studies in Economics and Finance." *Journal of Economic Literature* 35, No. 1 (March 1997): 13-39.

McGee, John S., "Ocean Freight Rate Conferences and the American Merchant Marine," *University of Chicago Law Review* 27, No. 2 (Winter 1960): 191-314.

Marvel, Howard P. "Exclusive Dealing." *Journal of Law and Economics* 25, No. 1 (April 1982): 1-25.

Masten, Scott E., and Snyder, Edward A. "United States versus United Shoe Machinery Corporation: On the Merits." *Journal of Law and Economics* 36, No. 1 (April 1993): 33-70.

Mullin, George; Mullin, Joseph; and Mullin, Wallace. "The Competitive Effects of Mergers: Stock Market Evidence from the U.S. Steel Dissolution Suit." *Rand Journal of Economics* 26, No. 2 (Summer 1995): 314-30.

Ornstein, Stanley I. "Exclusive Dealing and Antitrust." *The Antitrust Bulletin* 34, No. 1 (Spring 1989): 65-98.

Pirrong, Stephen Craig. "An Application of Core Theory to the Analysis of Ocean Shipping Markets." *Journal of Law and Economics* 35, No. 1 (April 1992): 89-131.

Posner, Richard A. *Antitrust Law: An Economic Perspective*. Chicago: University of Chicago Press, 1976.

Ramseyer, J. Mark; Rasmusen, Eric; and Wiley, Jr., John. "Naked Exclusion." *American Economic Review* 81, No. 5 (Dec. 1991): 1137-45.

Rose, Nancy. "The Incidence of Regulatory Rents in the Motor Carrier Industry." *Rand Journal of Economics* 16, No. 3 (Autumn 1985): 299-318.

Schwert, G. William. "Using Financial Data to Measure Effects of Regulation." *Journal of Law and Economics* 24, No. 1 (April 1981): 121-58.

Scott Morton, Fiona. "Entry and Predation: British Shipping Cartels, 1879 – 1929." *Journal of Economics and Management Strategy* 6, No. 4 (Winter 1997): 679-724.

Sjostrom, William. "Collusion in Ocean Shipping: A Test of Monopoly and Empty Core Models." *Journal of Political Economy* 97, No. 5 (Oct. 1989): 1160-79.

Sjostrom, William. "Monopoly Exclusion of Lower Cost Entry." *Journal of Transport Economics and Policy* 22, No. 3 (Sept. 1988): 339-44.

Slade, Margaret E. "Beer and the Tie: Did Divestiture of Brewer-Owned Public Houses Lead to Higher Beer Prices?" *Economic Journal* 108, No. 448 (May 1998): 565-602.

Standard and Poor's Security Owner's Stock Guide, various issues.

Standard and Poor's Standard Corporation Descriptions, 1961.

Standard and Poor's Trade and Securities, 1968.

The Stock Exchange Official Yearbook, 1960.

U.S. House of Representatives. Committee on Merchant Marine and Fisheries. *Report of the Committee on the Merchant Marine and Fisheries on Steamship Agreements and Affiliations in the American Foreign and Domestic Trade under H. Res. 587*. Document No. 805, 63d Cong., 2d Sess., Washington, D.C., 1914.

U.S. House of Representatives. Special Subcommittee on Steamship Conferences. *Hearings*. 86th Cong., 1st Sess., Washington, D.C., 1959.

U.S. House of Representatives. Subcommittee on Antitrust. *Monopoly Problems in Regulated Industries: Ocean Freight Industry*. Hearings. 86th Cong., 1st Sess., Washington, D.C., 1960.

U.S. House of Representatives. Subcommittee on Antitrust. *The Ocean Freight Industry*. Report No. 1419, 87th Cong., 2d Sess., Washington, D.C., 1962.

U.S. Senate. *Index to the Legislative History of the Steamship Conference/Dual-rate Law*. Document No. 100, 87th Cong., 2nd Sess., Washington, D.C., 1962.

U.S. Senate. Committee on Commerce. *Steamship Conferences and Dual-rate Contracts*. Report No. 860, 87th Cong., 1st Sess., Washington, D.C., 1961.

Yamey, B.S. "Predatory Price Cutting: Notes and Comments." *Journal of Law and Economics* 15, No. 1 (April 1972): 129-42.

Yong, Jong-Say, "Excluding Capacity-Constrained Entrants through Exclusive Dealing: Theory and an Application to Ocean Shipping," *The Journal of Industrial Economics*, 44, No. 2 (June 1996): 115-29.

Table 1. Size and Number of Approved Steamship Conferences, 1958.

Number of Members	Number of Conferences
2 – 6	48
7 – 11	35
12 – 16	24
17 – 21	10
22 – 26	4
27 or more	1

Source: John S. McGee, Ocean Freight Rate Conferences and the American Merchant Marine, 27 U. Chi. L. Rev. 191 (1960), at 191-208.

Table 2. Frequency Distribution of Spreads in Dual-rate Agreements of Steamship Conferences.

No. of Conferences	Amount of Spread	No. of Conferences	Amount of Spread
1	10%	18	$3
1	12.5%	14	$4
2	15%	8	$4.50
17	20%	5	$5
1	19% – 31%	2	$5.50
1	$2 per ton	2	$6
1	$2.50	2	$20

Source: U.S. House Special Subcomm. on Steamship Conferences, 86th Cong., 1st Sess., 2 Hearings (1959), at 620.

Table 3. Firms' participation in Conferences and their use of dual–rate contracts.

U.S. Firms					
	U.S. Lines	Moore-McCormack	American Export Lines	American President Lines	Lykes Bros. Steamship Co.
Number of conferences in which the firm participates	19	15	12	40	31
Conferences that employ dual-rate contracts	11	13	5	15	17
Per cent	58%	87%	42%	38%	55%
British Firms					
	The Cunard Steamship Co. Ltd.	Peninsular & Oriental Steamship Navigation Co.		Furness Withy & Co. Ltd.	Royal Mail Lines Ltd.
Number of conferences in which the firm participates	16	24		13	16
Number of U.S. conferences in which the firm participates	8	7		9	10
U.S. Conferences that employ dual-rate contracts	8	6		5	7
Per cent	50%	25%		38%	44%

Source: Calculated from U.S. House Subcomm. on Antitrust, 87th Cong., 2nd Sess., The Ocean Freight Industry (1962), at 50, 51, 56, 186 & 187. For the British firms, the first row is from Roland Bridges, Freight Conferences and Rebate Terms.

Table 4. Definition of Dichotomous Variables.

Variable	Event	Expected sign
Court1	Dual rate case argued before U.S. Court of Appeal (October 20, 1953).	+/-
Court2	U.S. Court of Appeals rules against dual-rate contracts (January 21, 1954).	-
Court3	Case argued before Supreme Court (December 11, 1957).	+/-
Court4	Supreme Court rules against dual-rate contracts and bill introduced to legalize dual-rate contracts permanently (May 19, 1958).	+/-
Leg1	House Antitrust Subcommittee concludes conferences have abused position. Calls for extended investigation and hearings. (October 20, 1959).	-
Leg2	Bill introduced in Congress to permanently legalize dual-rate contracts (February 15, 1961).	+
Leg3	House Merchant Marine Committee reports bill that would restrict dual-rate contracts (May 4, 1961).	-
Leg4	White House signals that Kennedy will not veto the bill (September 29, 1961).	+

Table 5. Estimated effects and test-statistic.

Event	Specification 1		Specification 3		Specification 3	
	U.S.	U.K.	U.S.	U.K.	U.S.	U.K.
Court 1	-0.1121**	-0.0134	-0.042**	-0.0016	-0.0226**	0.0056
	(-5.43)	(-0.61)	(-3.47)	(-0.13)	(-2.39)	(0.56)
Court 2	0.0093	0.016	0.0094	0.0135	0.0136	0.0101
	(0.44)	(0.72)	(0.77)	(1.06)	(1.40)	(1.02)
Court 3	-0.0155	-0.0024	-0.0159	-0.0133	-0.0137	-0.0090
	(-0.74)	(-0.11)	(-1.30)	(-1.04)	(-1.45)	(-0.91)
Court 4	0.023	-0.0173	0.009	-0.006	-0.0025	-0.0105
	(1.09)	(-0.78)	(0.76)	(-0.47)	(-0.27)	(-1.06)
Leg 1	0.0026	-0.0347	-.0024	-0.0329**	-0.0023	-0.0132
	(0.12)	(-1.57)	(-0.20)	(-2.58)	(0.81)	(-1.33)
Leg 2	0.0736**	0.0053	0.0382**	0.0206*	0.0212**	-0.0008
	(3.52)	(0.24)	(3.15)	(1.61)	(2.25)	(-0.08)
Leg 3	-0.0183	-0.0209	-0.0039	-0.0278**	-0.0009	-0.0302**
	(-0.87)	(-0.94)	(-0.32)	(-2.18)	(-0.09)	(-3.07)
Leg 4	-0.0270	0.0012	-0.0106	0.0061	-0.0078	-0.0113
	(-1.28)	(0.05)	(-0.87)	(0.47)	(-0.82)	(-1.13)

Note:
Specification 1: One dummy variable on the week of the event.
Specification 2: One dummy variable for three weeks, centered on the week of the event.
Specification 3: One dummy variable for five weeks, centered on the week of the event.

Table 6. Dissemination of information throughout the event window

Event		Variable 1	Variable 2	Variable 3	Period of Peak Effect	P-Value for joint test of 1 and 2	P-Value for joint test of 1, 2 and 3
Court 1	U.S.	-0.0604 (-4.15)**	-0.0013 (-0.20)	0.0189 (3.40)**	T	0.0002	0.0006
	U.K.	-0.0063 (-0.41)	-0.0019 (-0.27)	0.0059 (1.01)	T	0.8871	0.7069
Court 2	U.S.	0.0078 (0.53)	-0.0042 (-0.62)	0.0027 (0.48)	T-2	0.7152	0.4601
	U.K.	0.0153 (0.99)	-0.0043 (-0.61)	-0.0026 (-0.44)	T-1	0.5050	0.6571
Court 3	U.S.	-0.0168 (-1.14)	-0.0005 (-0.08)	0.0016 (0.28)	T	0.5218	0.5378
	U.K.	-0.0136 (-0.88)	0.0016 (0.22)	0.0023 (0.39)	T	0.6619	0.7955
Court 4	U.S.	0.0163 (1.11)	-0.0144 (-2.17)**	-0.0094 (-1.68)*	T-1	0.0508	0.0549
	U.K.	-0.0057 (-0.37)	0.0067 (0.96)	-0.0024 (-0.41)	T-2	0.5888	0.5304
Leg 1	U.S.	-0.0018 (-0.12)	0.0057 (0.86)	-0.0003 (-0.05)	T-2	0.6885	0.8505
	U.K.	-0.0415 (-2.71)**	0.0110 (1.59)	0.0142 (2.42)**	T	0.0071	0.0172
Leg 2	U.S.	0.0506 (3.47)**	-0.0092 (-1.39)	-0.0147 (-2.63)**	T	0.0009	0.0029
	U.K.	0.0274 (1.78)*	-0.0089 (-1.28)	-0.0141 (-2.40)**	T	0.0900	0.0607
Leg 3	U.S.	-0.0073 (-0.50)	-0.0056 (-0.84)	0.0032 (0.57)	T+1	0.6232	0.7935
	U.K.	-0.0259 (-1.69)*	0.0071 (1.02)	-0.0021 (-0.37)	T-2	0.1415	0.1410
Leg 4	U.S.	-0.0141 (-0.96)	-0.0012 (-0.18)	0.0032 (0.57)	T	0.6216	0.7963
	U.K.	0.0126 (0.82)	-0.0146 (-2.10)**	-0.0119 (-2.03)**	T	0.0793	0.0201

Note: Five week event window

Table 7. Individual Firm Effects

A. U.S. Firms' Coefficients Estimated for Variable Leg2

Specification	Moore-McCormack	U.S. Lines	Lykes Bros. Steamship Co.	American Export Lines	American President Lines
Quadratic	0.122 (4.96)**	0.108 (2.35)*	0.054 (1.38)	0.015 (0.543)	0.227 (2.96)**
Five Week	0.024 (1.624)	0.021 (1.650)*	0.011 (0.687)	0.003 (0.180)	0.046 (2.113)**
Three Week	0.052 (2.685)**	0.009 (0.533)	0.031 (1.550)	0.007 (0.336)	0.093 (3.380)**
One Week	0.192 (5.893)**	0.067 (2.323)**	0.061 (1.778)*	0.053 (1.474)	-0.007 (0.144)

B. U.S. Firms' Coefficients Estimated for Variable Court1

Specification	Moore-McCormack	U.S. Lines	Lykes Bros. Steamship Co.	American Export Lines	American President Lines
Quadratic (variable 1)	-0.047 (0.32)	-0.235 (9.2)**	N/A	-0.055 (1.91)	N/A
Five Week	-0.009 (0.629)	-0.047 (3.625)**	N/A	-0.011 (0.676)	N/A
Three Week	-0.015 (0.787)	-0.073 (4.403)**	N/A	-0.038 (1.795)*	N/A
One Week	-0.052 (1.561)	-0.203 (7.248)**	N/A	-0.081 (2.258)**	N/A

C. Individual British Firms Coefficients Estimated for Leg1

Specification	Cunard Steamship Co. Ltd.	Royal Mail Lines Ltd.	Furness Withy & Co. Ltd.	Peninsular & Oriental Steamship
Quadratic	-0.165 (3.55)*	-0.036 (0.37)	-0.046 (2.68)*	-0.016 (1.35)
Five Week	-0.033 (2.116)**	-0.007 (0.53)	-0.009 (0.69)	-0.003 (0.21)
Three Week	-0.057 (2.83)**	-0.019 (1.12)	-0.034 (2.00)**	-0.021 (1.06)
One Week	-0.035 (1.01)	0.001 (0.59)	-0.070 (2.38)**	-0.035 (1.01)

Note: Test statistics in parentheses (F-statistic for quadratic specification and t-statistic for others). Also, the quadratic effect presented is the *cumulative* estimated effect.