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# Predatory Pricing in the Domestic Liner Trades: It Can Happen<sup>1</sup>

by Allen R. Ferguson\*

## INTRODUCTION

Diagram 1<sup>2</sup> shows an index of the south-bound rates of the three incumbent liner companies in the Continental United States - Puerto Rico trade (the "PR trade") between September 1982 and September 1985. Given that a new firm entered in March 1984 and left in November 1984, it is a classic predatory pricing pattern.

A Federal Court in the Eastern District of Louisiana found, in April 1990, predation in that trade.<sup>3</sup> Specifically, it found conspiracy to restrain trade, monopolization, attempt to monopolize, and restraint of trade (by predation against the entrant). The Complaint alleged that the Incumbents had driven a small Entrant, American Caribe (AmCar) out of the trade.

This paper is based primarily on the Court record,<sup>4</sup> largely on the author's analysis as expert witness for the plaintiff. It touches only on the highlights of the economic case. The author reviewed thousands of individual rate filings between 1982 and 1985, covering 21 commodities that accounted for 65% of AmCar's south-bound revenue, as well as other data such as financial and traffic data. Tentative conclusions based on such objective evidence were confirmed by internal documents and other subjective information. Unfortunately, space does not permit incorporating much of the latter kind of evidence.

The market is defined as the ocean-liner, container trade between the Continental United States and Puerto Rico. The trade is large and important; Puerto Rico (PR) constituted the tenth largest U.S. export market. South-bound traffic is roughly three times north-bound traffic, which is basically a by-product.

All the Incumbents were large and well established. From 1973 through 1984 Puerto Rico Maritime Shipping Authority (PRMSA), SeaLand (S/L) and Trailer Marine Transport (TMT), the "Incumbents", served the market, with infrequent, short-lived participation by small carriers. PRMSA had 8 large ships, with a total container capacity of 3507 TEUs and 1,599 trailers. S/L had 26 large ships,

each with a capacity of more than 1,000 TEUs; TMT had 9 large RO/RO barges, each with a capacity of at least 288 trailers. All had substantial financial backing.<sup>5</sup> PRMSA was owned by the Commonwealth of Puerto Rico. Sea-Land was the largest American-flag liner company, with assets totaling \$1.8 billion. TMT was a subsidiary of Crowley Maritime Corporation, which, in addition to its extensive maritime transport and service operations, had the resources to purchase Delta Steamship Lines in 1982. In addition to the PR trade, PRMSA served other Caribbean markets; Crowley Maritime Corporation served Hawaii and Alaska and owned Delta Steamship Lines; S/L, of course, had extensive service to Europe, Asia and Alaska.

The trade was subject to economic regulation. The ICC regulated inter-modal rates, while the FMC regulated port-to-port rates. Rates on farm products were exempt, but could be filed voluntarily.

This is the market AmCar entered in late 1983, first sailing in March, 1984. It operated weekly out of Jacksonville with two tugs and three barges chartered from Gulf Fleet Marine Corporation, which also provided financial and administrative support. It put major emphasis on carrying reefer cargo. In contrast to the Incumbents, AmCar's barges had a capacity of 160 containers; it captured about 4% of the market.<sup>6</sup> Before the end of November 1984, it was bankrupt.

In the next Section, the history of rates is briefly described; then barriers to entry, monopoly, collusion, predation and, finally, policy implications of this experience.

## RATES

Diagram 2 shows general rate increases (GRIs) introduced by the Incumbents between June 1982 and February 1984, shortly before AmCar's first sailing. In those 20 months, the Incumbents simultaneously introduced three identical GRIs totaling 31.1%.<sup>10</sup> Each GRI was issued with substantial lead time, and both rates and effective dates were adjusted whenever, initially, there was less than unanimity among the Incumbents. Incumbents' rates on the 21 individual

DIAGRAM 1

Index Comparing September 1982 Rates  
To 1983 - 1985 Rates  
September 1982 = 100

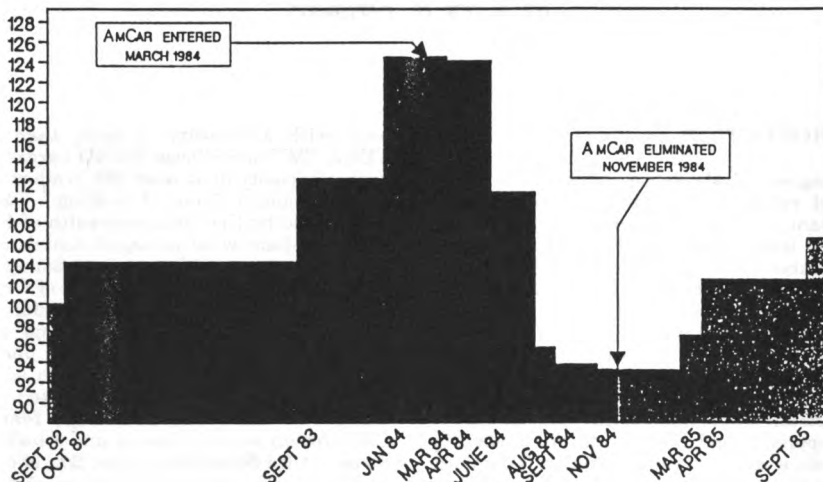
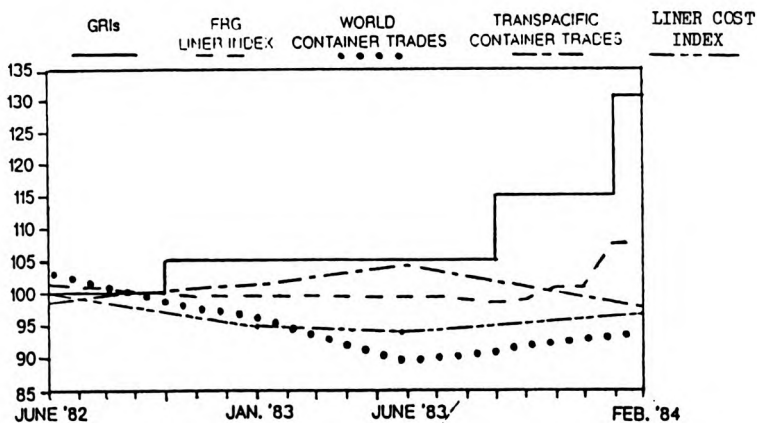


DIAGRAM 2

Index of the General Rate Increases In The Puerto Rican Trade  
And Other Liner Indices  
From 1982 - 1984  
September 1982 = 100



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commodities analyzed closely followed the GRIs.<sup>11</sup> The increase exceeded not only those in other liner trades for which rate indices are available, but also the rate of inflation in the inputs used by carriers in the PR trade.<sup>12</sup>

In June 1984, shortly after AmCar's entry, the pattern changed abruptly. All three Incumbents reduced rates on all 21 items; the Incumbents' rate cuts were uniform, large and costly. After AmCar's exit, rates were raised on 20 of 21 commodities beginning in January 1985.<sup>13</sup> The April GRI, the first in fifteen months, raised rates 10%.<sup>14</sup> Increases on refrigerated cargos ranged from 19% to 37.5%. By October, 1985, average real rates were within 2.2% of the June 1984 rates, rates at which AmCar earned a profit.<sup>15</sup>

## BARRIERS

Without barriers to entry, prices cannot long be held above competitive levels. Consequently, in their absence persistent monopolization would be impossible, collusion would be pointless, and predation would be irrational because of the impossibility of eventually recovering the cost of predation. Barriers need not be absolute, they need merely to put a potential entrant at a substantial disadvantage.<sup>16</sup>

There were important barriers to entry into the PR trade: First, under the Jones Act the domestic ocean trades may, with no relevant exceptions, be served only by American-flag ships that are neither subsidized nor owned by companies that receive maritime subsidies. Consequently, no foreign and no major United States-flag international liner company could enter the trade, except unsubsidized S/L. The legal constraints also made it possible for PRMSA to keep a vessel out of the trade, while the only other two ships potentially usable were precluded because they were controlled by a firm that also operated subsidized ships.<sup>17</sup>

Second, in addition to these laws, ICC and FMC regulation created other barriers. Most obvious, simply the mechanics of filing tariffs imposed disproportionately large costs on small carriers. More important, the ICC's thirty-day statutory filing requirement warned incumbents of any entrant's intentions and provided time to match or undercut its proposed rate. Third, both Commissions' rules for filing tariffs provide opportunities for obstructing entry. The Court record shows that regulatory obstacles were raised against entry by another small outsider<sup>18</sup> and AmCar was attacked for attempting to file on less than thirty-day's notice and for filing its strategically important time-volume discount rates (discussed below).<sup>19</sup> The ICC, in another proceeding, concluded that "under existing

notice periods a large, established firm can make it very difficult for a new, smaller firm to get a foothold in the trade."<sup>20</sup>

Fourth, preference contracts—analogueous to frequent-flyer constraints—are considered the most common exclusionary device in the liner trades.<sup>21</sup> When an Entrant has its fleet and organization and has set its schedule, in the short run—while it is becoming established, for example—every reduction in its traffic either increases its unit cost almost proportionately or forces a reduction in service. In the PR trade, exclusive agreements were common, and the Incumbents evidently increased their reliance on them when outsiders, specifically AmCar, were in the trade.<sup>22</sup>

Fifth, a history of past successful attacks on entrants may constitute a barrier, because it indicates that any new entrant can expect similar treatment. Elimination of such targets can also give incumbents confidence that they can similarly drive out future entrants.<sup>23</sup> Two small entrants were driven out by the Incumbents in 1983 (see below).

Finally, the fact, as is shown below, that the Incumbents had monopoly power over an extended period, itself, demonstrates conclusively the existence of barriers. There had never been any substantial, sustained new entry into the trade since Crowley acquired TMT in 1974.<sup>24</sup>

## MONOPOLY

Monopoly and collusion are widely accepted as being conducive to predation.<sup>25</sup> Monopolizing is any action to restrict competition.<sup>26</sup> Conditions in the PR trade at the time of AmCar's entry were conducive to monopolization. As already pointed out, there were high entry barriers. Also there was a three-firm oligopoly that accounted for essentially 100% of the market continuously from 1973; they divided the traffic approximately 50:30:20. Table 1 shows their south-bound market shares, 1983-1985.<sup>27</sup>

In the south-bound Puerto Rican trade, the actual Herfindahl-Hirschman Index (HHI) in 1984 was 3809; excluding AmCar, it would have been 3968. For total north-bound plus south-bound traffic the indexes were 4127 including, and 4275 excluding, AmCar. The Department of Justice, in contrast, considers a market to be "unconcentrated", where the HHI is less than 1000, and, where it is above 1800, a market is "... generally considered to be highly concentrated...."<sup>28</sup>

High concentration is, itself, not proof of monopolization. Consequently, a conclusion as to whether the Incumbents actually did monopolize must await several more kinds of evidence. That evidence emerged in the trial.

TABLE 1  
South-Bound Market Shares

|                | 1983   | Revenues<br>(\$ millions)<br>1984 | 1985   |
|----------------|--------|-----------------------------------|--------|
| <b>PRMSA</b>   | 233.67 | 233.61                            | 241.60 |
| Share of Total | 58.00% | 51.51%                            | 52.48% |
| <b>S/L</b>     | 61.44  | 78.87                             | 79.30  |
| Share of Total | 15.25% | 17.39%                            | 17.22% |
| <b>TMT</b>     | 107.78 | 131.62                            | 139.48 |
| Share of Total | 26.75% | 29.02%                            | 30.30% |
| <b>AmCar</b>   |        | 9.42                              |        |
| Share          |        | 2.08%                             |        |
| <b>Total</b>   | 402.89 | 453.52                            | 460.38 |
| <b>HHI</b>     | 4312   | 3802                              | 3958   |

First, conclusive proof that rates were maintained above competitive levels is provided by the facts that: AmCar was able to operate profitably<sup>29</sup> at rates below those the Incumbents had put into effect in early 1984.<sup>30</sup> Similarly, two very small carriers, (as discussed below) had under-cut the Incumbents' rates, apparently profitably.<sup>31</sup>

Second, it is possible here, unlike most cases,<sup>32</sup> to measure monopoly power by estimating the Lerner Index (LI). That Index, while theoretically sound, is typically impossible to estimate reliably. It compares the price-cost relationship in a particular market with that relationship under competition. Specifically,  $LI = p - c / p$ , where  $c$  = marginal cost and  $p$  = price. Its possible values range from 0, in competition, up to 1 in the limit, as monopoly power,  $p - c$ , increases. The impossibility of obtaining a satisfactory value for marginal cost precludes estimating LI satisfactorily in most instances. Here that problem is solvable. Since AmCar was able to earn profits in June 1984 at rates equal to or less than those charged by the Incumbents, it follows that the Incumbents' average rates in that month were not less than the competitive level. That average is,

then, an upper bound on long-run marginal cost. Subtracting the June 1984 average rate (for the commodities analyzed) from the average rate prior to AmCar's entry (both deflated) and dividing by the latter provides an estimate of the Lerner Index, namely 0.141. If, as the Defendant asserted, even the lowest rates it charged never fell below their long-run marginal cost, the minimum value of the Lerner Index immediately prior to AmCar's entry would be 0.283. The former value of LI reflects an average mark-up of 16.5% over total unit cost including the competitive return on capital; the second, a mark-up of 39.4%.

Third, there was also evidence of non-competitive price discrimination. Costs of transporting refrigerated vans exceeded those for dry vans by several hundred dollars.<sup>33</sup> Before the distortions of the 1984 price war, the average rate on refrigerated products was \$1652 or 78.7% greater than the average dry commodity rates. During 1984, rates on many refrigerated commodities were cut to less than the pre-AmCar rates on several dry commodities.<sup>34</sup> Frequently, rates did not reflect other differences in cost. For example, identical rates were routinely published for shipments

from Charleston and Miami to San Juan, even though the Incumbents actually sailed only out of Jacksonville and absorbed the cost of inland transportation on those movements.

Fourth, average rates were not perceptibly related to changes in market demand or to industry costs. Prior to AmCar's entry, as described above, the major carriers raised rates steadily and more rapidly than the rate of inflation of their costs. Changes in demand did not appear to determine the rate pattern. In Puerto Rico, imports are highly correlated with gross product and neither moved in a manner compatible with the rate pattern.<sup>36</sup> The only widely applicable rate decreases occurred when genuine competitors entered briefly. Once they were eliminated, Incumbents both resumed issuing uniform GRIs and raised the individual rates with which they had matched or undercut the neophytes.

### COLLUSION

Collusion is defined here as cooperation among sellers to monopolize. Three attributes of the Puerto Rican trade making it an apt incubator for collusion are briefly described<sup>36</sup>: entry barriers, concentration and the small number of sellers, economic regulation.

I have already shown that barriers and concentration were extraordinarily high and that only three parties were required to agree—explicitly or implicitly—on any action.

Economic regulation facilitated collusion by solving the problem of communicating about and enforcing agreed prices. Rates must be published in tariffs, and, normally in 1984, on thirty-days advanced notice.<sup>37</sup>

Table 2 shows how intentions about the GRI tariff filings could have been signalled among the Incumbents. All GRIs were initially filed on more than statutory notice. Then, if all Incumbents did not match the proposed rate and effective date, the initiator of the change made adjustments until unanimity was achieved.<sup>38</sup>

The fact that GRIs were a standard instrument for raising rates, itself, suggests absence of competition. One would expect three sellers of hundreds of similar goods to seek price increases by trial and error, more or less continuously adjusting rates both up and down. In the PR trade, in the absence of outsiders, most rates were increased simultaneously and more or less periodically over a decade.

Similarly, during rate recovery in 1985, of 40 separate rate changes the vast majority were postponed or filed on statutory or greater notice, and the final rates and most of the effective dates were identical.<sup>39</sup>

The tariffs provide additional evidence: In one instance, S/L was able to signal its intent to increase rates on three refrigerated

commodities by concurrently showing two different rates (only one of which was used, presumably) for the same commodity in the same tariff; a single operational rate was not instituted until the other carriers had raised theirs. Also, the Incumbents often filed rates on exempt commodities.

If, in fact, the Incumbents valued the existing, long filing interval, they could be expected to defend it if it were ever challenged. It was, and they did. In 1984, when the ICC proposed " ... a new rule requiring one-day's notice for rate reductions and new rates, and seven-days' notice for rate increases ...", the Incumbents did oppose that change. Small, new carriers, on the other hand, in both the PR and other domestic trades supported the proposed change.<sup>40</sup>

Behavior of the Incumbents was not just parallel pricing. Each GRI and many individual rate increases appeared to reflect communication, at least, through the tariff process. This inference from economic analysis was supported by direct evidence in internal documents. Two instances can be cited: TMT made representations to ICC to adjust the effective date of a rate filing in order to give up a competitive advantage vis-a-vis PRMSA.<sup>41</sup> Astonishing insider evidence comes from Mr. Valencia<sup>42</sup>, S/L's sales agent, who referred repeatedly to personal contacts with TMT, discussing such topics as TMT's ability to remain competitive with respect to transit time, TMT's ability to keep track of AmCar, and PRMSA's redeployment of vessels.

### PREDATION

The various definitions of predatory pricing<sup>43</sup> typically contain a common element, namely, cutting prices uneconomically to eliminate or coerce a rival, specifically, "...the practice would be unprofitable without the exit it causes."<sup>44</sup> Because predation requires a short-run loss of profit, profit-maximizing firms would rationally launch a predatory campaign only if they expected to recover the cost of predation, i.e. the net impact on profits of both the market penetration and of the predatory acts. The net cost of predation is likely to be small or negative.<sup>45</sup> Further, in the PR trade, it would be reduced by any expected increase in or protection of profit in the Incumbents' other markets.

Before AmCar entered, the Incumbents had already driven two small carriers out of the market. American Marine Lines (AML) operated three voyages with a single vessel out of Philadelphia,<sup>46</sup> carrying about 100 containers. AML undercut the pre-existing rates by about 10%. The Incumbents all matched those rates simultaneously, but only out of ports served by AML and only on

**TABLE 2**  
**General Rate Increases in the Puerto Rican Trade**  
**(Terminal-to-Terminal Rates)**

|             | Carrier    | Issue Date | Effective Date         | Percent Increase |
|-------------|------------|------------|------------------------|------------------|
| Fall 1982   | S/L        | 82 08 16   | [82 10 15]             | [15]             |
|             | Intermodal | 82 09 14   | 82 10 15               | 3                |
|             | TMT        | 82 09 07   | 82 10 15               | 5                |
|             | PRMSA      | 82 09 15   | 82 10 15               | 5                |
| Summer 1983 | TMT        | 83 06 15   | [83 07 20]<br>83 09 01 |                  |
|             |            | 83 08 05   | 83 09 06               | 10               |
|             | S/L        | 83 06 29   | 83 09 01               | 10               |
|             | PRMSA      | 83 07 07   | 83 09 01               | 10               |
| Early 1984  | S/L        | 83 11 15   | 84 01 16               | 13.5             |
|             | TMT        | 83 12 09   | 84 01 16               | 13.5             |
|             | PRMSA      | 83 12 15   | 84 01 16               | 13.5             |
| Early 1985  | TMT        | 85 03 19   | 85 04 26               | 10               |
|             | PRMSA      | 85 03 21   | [85 04 21]             |                  |
|             | S/L        | 85 04 01   | 85 04 26               | 10               |
|             |            | 85 03 27   | 85 04 26               | 10               |

[ ] enclose initially proposed increases, subsequently postponed or changed.

commodities it carried.<sup>47</sup> After AML exited, all three cooperated to raise rates simultaneously. There is substantial evidence in the record that the intent was to eliminate AML.<sup>48</sup> Seabulk, operating one tug and barge, entered part of the trade in 1982, emphasizing low-rated paper products. The Incumbents cut rates on traffic that Seabulk carried and, once it left the trade, raised them again.<sup>49</sup>

The court record indicates, in both cases, predatory intent and the use of the regulatory system to coordinate both reductions and, after the entrant's elimination, rate recovery.<sup>50</sup> Consequently, each Incumbent had strong grounds for expecting that the other two would cooperate again in increasing rates if they attacked AmCar. Several pieces of evidence show actual predation against AmCar.

First, as described above, the rate patterns were exactly consistent with predation.

Second, the rate reductions were not general, but were targeted at AmCar.<sup>51</sup> As shown in Diagram 3, rates out of Jacksonville were cut more than all-port rates; they were

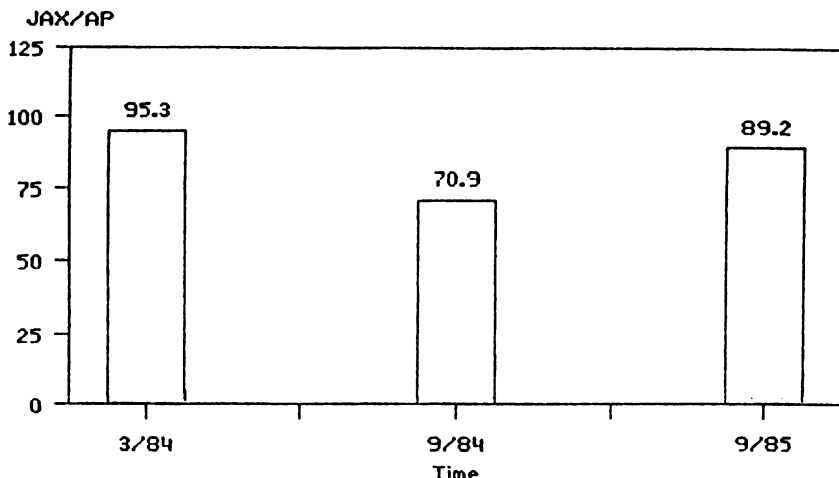
also cut more than rates out of North Atlantic ports. There was, in contrast, no systematic pattern of rate cuts on tanker containers or on motor vehicles, neither of which were important to AmCar. However, on AmCar's most important traffic, packinghouse products, rates were cut 43%.<sup>52</sup>

Third, the rate cuts were costly to the predators and lethal to the prey: By November, 1984, real rates (deflated by the liner cost index) had been reduced an average of 23.3% (weighted by contribution to AmCar's revenue) below their level when AmCar entered.<sup>53</sup> The direct cost of predation to TMT was \$17.2 million; to S/L, \$6.4 million.<sup>54</sup> The Insiders' cut their rates in important instances, below their reasonably expected cost; for example, they cut rates on important reefer cargoes to less than the pre-AmCar rates on several dry commodities. By the author's calculation, the cuts cost AmCar at least 17.47% of its gross revenues.

Fourth, the rate cuts against AmCar not only matched its rates but often undercut them. There were two categories of undercuts, "Catco" and "Obvious". The first refers to a special AmCar Tariff Section, 6A, which



DIAGRAM 3  
Geographic Targeting  
(Jacksonville vs. All-Port Rates)



provided for deep discounts in exchange for a shipper's shipping 3,000 vans of specified dry and refrigerated commodities per year. The single shipper who used that tariff was an affiliated middleman, "Catco", which planned to charge the ultimate shipper only a modest discount off the regular tariff rates. This maneuver was designed to deny the Incumbents knowledge of rates actually charged the shipping public. The Incumbents responded by publishing any-quantity rates which, while nominally equal to AmCar's volume discounts, in fact, grossly undercut them. In addition, while AmCar's Section 6A rates were available only to the minute minority of shippers who consigned enormous volumes of traffic, the Incumbents' rates were available to all shippers. The "obvious" cuts applied to 10 of the 21 commodities analyzed on which rates were reduced even below AmCar's any-quantity rates. These commodities whose rates were undercut accounted for 40.5% of total AmCar revenues.

Fifth, Incumbents' short-run profits were reduced. It seems obvious that cutting rates 25% to eliminate a threat to 3% of the market would not maximize short-run profits. In fact, subtracting TMT's annualized short-run profit at the predatory level from that which it would have realized at pre-AmCar rates shows a reduction in profit of \$12.9 million. Revenues were estimated allowing for maximum reasonable expansion of output by other carriers; short-run profit was calculated by subtracting variable cost, as estimated by

Defense's financial expert, from revenues, in both the predation and the monopoly cases.<sup>66</sup>

A final, conclusive fact: After AmCar exited, the Incumbents more than recovered the cost of predation. First, through recovery of AmCar's south-bound traffic (annualized, a gross revenue of \$14.85 million), TMT made an estimated rate of return of 43% on its \$13.8 million investment in predatory pricing. Second, by late 1985, average real rates were above their predatory level in 1984 and were within 2% of the level of June, 1984, when AmCar was profitable.<sup>66</sup> They continued to rise, and, in October 1989, were 8% above that level.

#### POLICY IMPLICATIONS

The District Court found that there was predatory pricing as well as monopoly and collusion in the Puerto Rico trade. Those findings and the evidence summarized above indicate that, contrary to a substantial body of economic and legal opinion, predatory pricing is, in fact, a real phenomenon that can restrain trade by impairing competition. They also reinforce economic criticisms of the Jones Act. The Jones Act makes the cost of entry virtually infinite for all foreign and for the vast majority of American ships and liner companies.

There were several other factors, some of which may apply to the U. S.-foreign trades as well. The mere availability of technically

critical assets—vessels in this case or aircraft in aviation—did not provide adequate potential competition. Exclusive contracts were prevalent. There was no governmental antitrust enforcement. Regulation provided means of raising entry costs and of collusive communication. Collusion facilitated monopolization.

These facts suggest important implications for the evaluation of the Jones Act. Once again there is evidence that it raises costs and prices through its enormous barriers. Indirectly, by permitting only very high-cost vessels, whose only realistic alternative employment is in other domestic trades, the Act also raises sunk costs, further impairing contestability. Similarly, by reducing the number of market participants, it facilitates collusion and tends to contribute to high levels of concentration. If, as seems reasonable, the Jones Act increased the cost of transportation in the PR trade by as little as 25%, it brought about a dead weight loss of at least \$125 million, annually, during the 1980's.

In effect, the litigation in the Puerto Rico trade can serve as a natural experiment in evaluating the contestability of the domestic liner trades. The experiment shows that they are not necessarily contestable and that, in the absence of antitrust enforcement, rates can be maintained above the competitive level, and both uneconomic rate discrimination and predatory elimination of potential competitors are possible.

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ENDNOTES

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2. The source of all rate data in this and the other Diagrams and in Tables 2-5 is the tariffs of the participants in the PR trade. The source for Table 1 is AmCar's traffic records.
3. Zapata Gulf Marine Corporation, Etc. versus Puerto Rico Maritime Shipping Authority, et al, Civil Action No. 86-2911.

4. The form of some citations reflects this fact. "PL # . . ." means Plaintiff's Exhibit.
5. U.S. MARAD, (1984), 17, 18-20, 23.
6. For the significance of financial reserves in predation see Telser; Areeda and Turner (1978b), Chapter 7c, 711; and Areeda and Hovenkamp, at 711.2, 403 ff.
7. Sea-Land, *Annual Report 1985*, 17 and 18, on file at the Securities and Exchange Commission.
8. Concerning participation in more than one market, see Easley; Masson and Reynolds; Milgrom and Roberts.
9. It earned just over 2% of the 1984 south-bound revenues in eight and one-half months, Table 2.
10. GRLs were often accompanied by increases in accessorial charges; they roughly offset the flag-outs. In addition, changes in rules, e.g., reduced trailer sizes for specific rates, sometimes raised effective rates.
11. Nineteen of the 21 rates analyzed in detail rose almost exactly in step with the 1983 and 1984 GRLs.
12. Liner rate indexes are costly and scarce. The FRG index is reported in Janssen and Schneerson, Ch 3. Those for "World Container Trades" and "Transpacific Container Trades" were published by J. G. Reeve, an expert for the Defense, and M. L. Sciar, both of Temple, Barker and Sloane. The liner cost index for the PR trade was prepared by the author. During this period, the CPI rose by 5.3%.
13. No rates on grocery store items were increased. In addition, neither TMT nor S/L increased rates on flour out of New Prague and S/L reduced rates on vegetable oil out of Medley, Florida.
14. Additional effective increases resulted from such actions as deleting discounts for particular inland points and eliminating some rates or reducing the size of containers to which rates applied. (See, for example, TMT's Tariff 2018, p. 45, revision 2.)
15. Both Plaintiff's, Dr. Stephen Jizmagian, and Defendant's, Dr. Frederick C. Dunbar, financial experts found that AmCar earned accounting profits in that period.

16. Ferguson, J. M., 10 and Areeda and Hovenkamp, 410.
17. Cf PL #133 for detailed explanation of restrictions. In addition to the three Incumbents, PRMSA's Executive Director stated that only two major operators, Matson and TOTE had vessels that might conceivably be allocated to the trade.
18. PL #38, and see page 14 below.
19. ICC Docket No. 39800, *Annual Volume Rates, Florida to Puerto Rico, American Caribe Lines*.
20. *Short Notice Effectiveness for Independently Filed Single-Factor Motor-Water Rates*, Interstate Commerce Commission, Ex Parte No. MC-170 (Sub No. 1), Decided April 15, 1987, 719.
21. Janson and Schneerson, 40; see also McGee, J. G. in Ferguson, et al: *The Economic Value of the United States Merchant Marine*, 376-381 and 384-5.
22. PL #28, #72, #98, #99.
23. Milgrom and Roberts (1982), 281; Joskow and Klevorick, 231; Saloner, pp. 180, 182; and Yamey, pp. 131, 140, 142. A TMT manager, argued that quick attacks "... would cause future competitors to have second thoughts." PL #29.
24. That was not an entirely *de novo* entry, since TMT was a bankrupt carrier that had been serving the trade.
25. Jaskow, and Klevorick, 222-234; Shepherd (1986), 7, 13; Williamson (1984), 482; and Scherer (1980), 276-285.
26. Cf Scherer, (1990), 449-50.
27. The Defense's expert asserted that the Incumbents' market share was only 23%. That estimate was based on their share of all capacity in the domestic trades plus all the known technically suitable U.S.-flag tug-barge fleet. That concept of the relevant market seemed inappropriate in that, *inter alia*, it ignored problems of reallocating capacity and creating new ocean liner firms. It is not discussed further here.
28. DOJ Guidelines, 26823-837.
29. Although they differed on the magnitude of the profit realized by AmCar, both the Plaintiff's and the Defendant's financial experts stated that AmCar was profitable in June, 1984. (Testimony, March 1, 1990, vol. 56, pl and Testimony, March 2, 1990, vol. 57, p 11.)
30. Further AmCar had intended to enter at the rates in effect prior to the 1984 GRI.
31. Presumably, the managers of the Majors believed that the interlopers could earn at least the market rate of return at their cut rates, for they incurred millions of dollars in costs in driving the entrants out. Driving out AmCar also required an investment of tens of millions of dollars.
32. Scherer (1980), 415.
33. Estimates vary from about \$200 to \$800 per unit, but there is no dispute about the fact transporting reefers costs more because of their greater capital cost, energy requirement and time sensitivity of their cargoes.
34. Incumbents' tariffs.
35. Gross Product data were provided by Banco Publico de Puerto Rico.
36. For a more detailed, general discussion of factors contributing to collusion, cf Vaska, 510; Scherer (1980), 199-227; Hay and Kelley 13, 14-17.
37. Rates could be filed on less than statutory notice after approval of a request by the relevant Commission. Under the FMC, rate reductions could be filed on one-day's notice. The notice period required by the ICC has been shortened since 1984.
38. SL's 3% increase in Fall 1982 was an increase in intermodal rates which include the cost of inland transportation. The 3% change is approximately equivalent to a 5% change in terminal-to-terminal rates.
39. In one of many examples, PRMSA published increases on 60 days' notice "... to give our competition 60 days to react" (PL, #66) and on 90 days notice "... to give Sea-Land and TMT an opportunity to match our action." (PL #34)
40. Ex Parte No. MC-170 (Sub No. 1), 714-28.
41. Hollett Testimony, February 5, 1990, vol. 33, pp 28-41.
42. Valencia deposition in Testimony, vol. 32, 128-130: Plaintiff Attorney: "So if

- you knew which customers AmCar was serving, you would share that information as well?" Mr. Valencia: "As they would with us." (p. 130)
43. Areeda and Hovenkamp, 395-397; Baumol, (1979a), 236, and (1979b), 1; Dirlam, 812-13; Fudenberg and Tirole (1986), 366-67; Joskow and Klevorick, 219-20; Kahn (1978), 4-5; Ordovery, and Willig, 9-10.
  44. Ordovery and Willig, 9.
  45. Cf the author's forthcoming article, "The Predatory Loss".
  46. AML advertisement, *Journal of Commerce*, 1-20-83.
  47. These reductions were the only "general rate decreases" since, at least, 1975. PL #38.
  48. For example, PL #57, 58 and 66. PRMSA memoranda which show that rates were cut against AML and raised, again, after its exit.
  49. "Since SeaBulk is no longer operating . . . revert back to open rate . . . . A notice of 90 days required to allow competition to follow." (PL #35) Other examples in PL #60, #61, #74.
  50. PL #57 and #58 and PL #38 (Ex I.I.C, #2).
  51. ". . . our objective of making deep cuts at (sic) AmCar is effective and active." (PL #104) Another example, PL #105, states, in part, "We [TMT] definitely were having significant negative impact on AMCAR . . ."
  52. Calculated from Incumbents' tariffs.
  53. Based on the lowest rates in effect by any of the Incumbents. Data were not available for weighting rates by contribution to the Incumbents' revenues.
  54. The cost figure includes \$3.4 million in losses from predatory acquisition of assets by TMT, an action that figured prominently in the trial but that is not discussed in this article.
  55. The short-run loss was greater, using Plaintiff's financial expert's AVC. Expansion by S/L was not included because, at the time the calculation was made, it was one of the Defendants. The analysis showed that S/L also incurred short-run losses.
  56. Incumbents' tariffs.