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# Mobility Barriers in the Motor Carrier Industry

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## I. INTRODUCTION

The Motor Carrier Act of 1980 (MCA) substantially reduced regulation in the motor carrier industry. The post-MCA environment gives motor carriers far greater freedom in deciding which markets to enter and what commodities to carry. The purpose of this paper is to investigate a particular class of motor carrier strategic decisions—commodity specialization. With the advent of deregulation, there has been increasing attention directed toward the strategic management literature and its application to trucking strategies.

Organizational strategy deals with major decisions by firms as they attempt to meet the challenges of the marketplace (Hambrick 1980). Dimensions of strategy include pricing policies, customer service, advertising and marketing efforts, financial control measures, and many other management actions. It is generally agreed that a firm's performance is at least partially determined by management decisions regarding approaches to executing the basic functions of the firm.

Research to date on firm strategies in the motor carrier industry (McGee, 1982; Tye, 1983; Walters, 1985) has been largely descriptive, with a focus on interviews and case studies. Both emphasize expansion of existing services and diversification into new services, appropriate reactions to the environmental changes brought by the MCA of 1980. However, there are disagreements among analysts regarding specific motor carrier strategies. For example, Tye (1983) foresees a decrease in selective service as rates on previously unprofitable traffic rise, while McGee (1982) envisions "greater concentration of carriers' assets to meet traffic movements." Such statements reflect a degree of uncertainty over what strategies are being practiced and point to the need for further strategy research.

Two empirical studies of motor carrier strategies have been performed. Booz, Allen, and Hamilton (1984) identified management and operating characteristics of carriers that performed above and below average. They found that successful firms focused more on marketing, customer service, and firm diversification than did their less successful counterparts. The study used discriminant analysis to separate the firms and then analyzed the groups to ascertain the most important differences. Not surprisingly, since firm strategy has been demonstrated to greatly affect performance in many industries, strategic factors such as marketing, service quality, and diversification were found to explain much of the difference in performance between firms.

The second empirical study was performed by Corsi, Grimm, and Smith (1986). The authors used Porter's (1980) framework regarding generic strate-

gic groups to derive and operationalize two key dimensions for motor carrier strategies: low cost and product differentiation. Then, motor carrier annual report data for 1977 and 1984 was presented to test the hypothesis that on average, carriers increased their emphasis on these strategic dimensions with deregulation. Support was found for this hypothesis, with strongest evidence on a greater emphasis on product differentiation in 1984 versus 1977.

These previous studies have provided insight into actual strategic factors employed in the industry. They also support other theoretical and empirical findings that strategy affects performance. However, there has been no analysis of a key motor carrier strategic variable, choice of product focus. Motor carrier firms can choose to carry a variety of commodities: general freight (less-than-truckload), general freight (truckload), household goods, refrigerated products, petroleum products, etc. Given the freedoms granted carriers to change their focus, it is of interest to determine the degree to which firms have shifted commodity focus and the types of shifts which have occurred most frequently. In addition, this paper will examine the performance implications of a change in focus. The investigation will be guided by strategic management and economics literature on mobility barriers and the experience curve. The following section will review this literature and relate it to motor carrier commodity focus. Then, evidence on commodity shifts will be presented and analyzed.

## II. EXPERIENCE CURVE AS A MOBILITY BARRIER

The decision by a motor carrier to switch commodity focus is analogous to a major change in strategy or strategic group. As discussed by Caves and Porter (1977), mobility barriers are elements which deter firms from duplicating another firm's strategy. In the process of strategic interaction, firms attempt to build and maintain mobility barriers. Other firms may try to overcome existing barriers by switching strategies; however, they should anticipate reactions from firms whose strategic territory is threatened.

Perhaps the most important mobility barrier is the cost and productivity advantage acquired by firms experienced with a particular strategy. The concept of an experience curve, popularized by the Boston Consulting Group (1972), posits a relationship between costs and accumulated volume of production. As discussed by Hax and Majluf (1982), the concept has been most commonly applied to manufacturing processes such as production of integrated circuits.

air conditioners, or primary magnesium. Empirical studies performed for all of the above products reveal a substantial cost advantage for firms with larger cumulative production over time. The cost advantage derives from factors such as employee learning, specialization and redesign of labor tasks, product and process improvements, and system rationalization. The benefits of experience are often summarized under the label "know-how," which represents a rich knowledge of operational, managerial, and technological factors affecting costs and productivity in the firm.

The concept of the experience curve can be applied to the motor carrier's choice of commodities. It would appear likely that firms switching commodity focus would be at an initial disadvantage versus carriers with significant experience hauling that commodity. Thus, we would expect firms that changed their primary commodity between 1977 and 1985 to have higher costs, lower productivity, and lower profits than firms which carried the same commodity in both 1977 and 1985. Furthermore, we would anticipate firms which shifted commodities may perform worse than those firms which carried the same commodity in 1977 and 1985.

Our purpose then is to investigate the extent of mobility barriers, particularly the experience curve, in the motor carrier industry. We will first investigate the proclivity of strategic change regarding commodity focus and identify the most common commodity alterations. To the extent that strong mobility barriers exist, we would expect few firms to change their commodity strategy between 1977 and 1985. Then, we will examine more carefully the performance impacts of this change. Specifically, 1985 performance of firms changing commodity focus will be compared with firms specializing in the same commodity who did not switch from their 1977 focus. To the extent that the experience curve is applicable, we would expect firms inexperienced with handling a particular commodity to have higher costs, lower productivity, and lower profits. To gain further insight on the ramifications of switching commodity focus, we will compare profitability of firms who changed focus with that of the firms with the same primary commodity in 1977 who did not change.

### III. DATA AND METHODS

The authors obtained 1977 and 1985 data tapes from the American Trucking Associations. These tapes were compiled from the Annual Reports of Class I and II motor carriers filed with the Interstate Commerce Commission (ICC) in those respective years. In its annual report, each carrier denotes its primary commodity. The seventeen commodity classifications, used in the annual reports correspond to the categories in the ICC's commodity classification scheme (See list in Table 1).

Each carrier's primary commodity designation in 1977 was compared to its 1985 designation. The data across segments and time were summarized in tabular form to indicate the following: (a) percentage of firms by segment with the same primary commodity designation in 1977 and 1985 and (b) percentage of firms by segment shifting commodity focus between 1977 and 1985. The data in these tables document the extent to which carriers have changed their commodity focus during the transition from a highly regulated environment to a less regulated one. In addition, the analysis shows which segments in 1985 have the highest percentage of carriers who have entered from other segments between 1977 and 1985.

After documenting the extent to which firms changed their primary commodity during the transition, the paper will focus on investigating the impacts of this major strategic change. Specifically, the annual report data will be used to compare the 1985 costs, productivity, and profits of firms that changed their primary commodity between 1977 and 1985 with those of the firms specializing in the same commodity who made no such change between 1977 and 1985. The difference of means test will be employed by segment to indicate the statistical significance of the observed mean difference in costs, productivity, and profits between the two groups of carriers. The cost measures used are the following: (1) operating expenses per mile (ton-mile); (2) line haul expenses per mile (ton-mile); (3) pick-up and delivery expenses per ton; (4) general and administrative expenses per mile (ton-mile); (5) insurance and safety expenses per mile; (6) traffic and sales expenses per mile; and (7) maintenance expenses per

TABLE 1  
Stability in Commodity Focus  
by Industry Segment, 1977-1985

| Industry Segment             | % of Firms with<br>Same Primary Commodity |            |
|------------------------------|---|------------|
|                              | 1977 and 1985                             | # of Firms |
| General Freight (LTL)        | 94  | 227        |
| General Freight (Truckload)  | 50  | 105        |
| Heavy Machinery              | 75  | 28         |
| Petroleum Products           | 85  | 92         |
| Refrigerated Solids          | 79  | 58         |
| Agricultural Commodities     | 52  | 50         |
| Building Materials           | 79  | 61         |
| "Other" Specialized Carriers | 75  | 316        |
| Overall                      | 77  | 937        |

mile. The productivity measures compared are: (1) vehicles miles per truck and (2) ton-miles per vehicle mile. The profit measures used are: (1) operating ratios and (2) net income/total assets.

In addition, the 1985 profits of the carriers who shifted their primary commodity between 1977 and 1985 will be compared to the 1985 profits of firms with the same primary commodity in 1977 who did not make such a strategic change. Again, observed differences between the two groups will be tested for statistically significant differences through the use of a difference of means test.

A few comments regarding data limitations are in order. The Annual Report data used in this study is limited by the extent to which carriers failed to file reports in either 1977 and 1985. However, the large sample size (937) ensures a rich representation of motor carrier behavior. Moreover, for the purposes of this analysis the failure by a limited number of firms to report does not bias study results unless under-reporting is significantly different for carriers who shifted commodity focus as opposed to those who made no such shifts. However, there is no basis for such a bias.

Secondly, a more complete study of commodity behavior is precluded in that only the primary commodity is indicated on the annual reports. To the extent that carriers are newly handling traffic in other segments without changing their primary focus, some of a firm's commodity diversification activities are masked. The paper then is limited to analysis of the major strategic change of altering one's primary commodity.

The remaining sections of this paper summarize the extent to which firms made major strategic changes by shifting their commodity focus during the transition years, evaluate the impact of this type of major change, provide insights into the existence of mobility barriers in the industry, and assess the implications of the empirical results for the industry managers.

#### IV. SHIFTS IN COMMODITY FOCUS

Table 1 substantiates by industry segment the extent to which there was stability among motor car-

riers in their primary commodity focus between 1977 and 1985. The data in Table 1 are based upon the primary commodity identification supplied by 937 Class I and II motor carriers in both 1977 and 1985.

Overall 77 percent of the firms made no change in their primary commodity focus during the study period. However, the overall indication averages a substantial variation in shifts among the individual industry segments. Those with the highest levels of strategic shifts in commodity focus are: the general freight (truckload) and agricultural commodity segments. Those with very low levels of strategic shifts are: the petroleum products and general freight (LTL) carriers.

Among the 105 firms with a general freight (truckload) focus in 1977, only 50 percent had that same designation in 1985. Of the 53 firms who changed their commodity focus, 34 shifted into the general freight (LTL) designation, while 13 moved into the "other" specialized commodity category. Among the 50 firms with agricultural commodities as a primary focus in 1977, only 52 percent kept that focus during the transition period. Of the 24 firms who shifted their commodity designation, 8 moved to the refrigerated solids segment, 7 switched to "other" specialized commodities, and 5 went to the general freight (truckload) segment.

In sharp contrast, 85 percent of the 92 petroleum products carriers in 1977 also had the same commodity focus in 1985. Similarly, 94 percent of the 227 general freight (LTL) carriers in 1977 also had the same commodity focus in 1985.

The remaining four industry segments (heavy machinery, refrigerated solids, building materials, and "other" specialized carriers) all had between 70 and 79 percent of the firms in 1977 keep the same commodity focus throughout the study period. Among the 78 "other" specialized carriers who shifted their commodity focus between 1977 and 1985, 50 moved into the general freight (truckload) segment.

Table 2 analyzes the extent of commodity shifting by industry segment. It shows that overall 23 percent of the motor carriers in 1985 shifted their commodity focus between 1977 and 1985. Again, this overall average masks some important variations in

TABLE 2  
Extent of Commodity Shifting  
by Industry Segment, 1977-1985

| Industry Segment             | % of Firms who<br>Shifted into the Segment<br>between 1977-1985 |            |
|------------------------------|---|------------|
|                              |   | # of Firms |
| General Freight (LTL)        | 15  | 251        |
| General Freight (Truckload)  | 62  | 136        |
| Heavy Machinery              | 32  | 31         |
| Petroleum Products           | 6   | 83         |
| Refrigerated Solids          | 22  | 59         |
| Agricultural Commodities     | 19  | 32         |
| Building Materials           | 19  | 59         |
| "Other" Specialized Carriers | 17  | 286        |
| Overall                      | 23  | 937        |

shifting patterns among the industry segments. For example, among the 136 general freight (truckload) carriers in 1985, 62 percent shifted into this segment between 1977 and 1985 from another segment. Among the 31 heavy machinery carriers in 1985, 32 percent changed their commodity focus between 1977 and 1985. In contrast, among the 83 petroleum products carriers in 1985, only 6 percent moved into this segment between 1977 and 1985.

As posited earlier, existence of strong mobility barriers in the motor carrier industry would be substantiated by the finding of little shifting in commodity focus by the firms between 1977 and 1985. Results in Tables 1 and 2 substantiate that some of the industry's segments have much higher mobility barriers than do others.

Some segments, such as general freight (LTL) and petroleum products carriers, appear to have characteristics which makes shifting into another segment or out of the segment difficult. The general freight (LTL) carriers have extensive terminal networks or a heavy capital investment compared to carriers in other industry segments. Furthermore, such carriers require extensive customer support systems and marketing expertise that transcend the requirements in other industry segments. The petroleum products carriers have highly specialized, expensive trailers requiring high maintenance. Furthermore, these assets are not transferable to other industry segments. Thus, in these two segments the required infrastructure development and equipment specialization would increase the likelihood that firms could gain significant cost and productivity advantages through experience. Hence, this preliminary evidence points to the existence of existence mobility barriers in these two industry segments.

In contrast, other segments, such as general freight (truckload), have a much lower percentage of their firms staying in the same segment between 1977 and 1985. Furthermore, a high percentage of firms in these segments in 1985 have shifted into that segment between 1977 and 1985. The general freight (truckload) segment does not have specialized equipment needs nor does it require extensive capital expenditures for terminals. Certainly, evidence in this segment points to a less complicated operating environment, fewer advantages to be gained from experience, and less likelihood of mobility barriers.

Having documented the extent of strategic shifts in product focus and discussed the implications regarding the existence of mobility barriers in the industry, it is critical to examine the performance of the carriers who shifted their commodity focus with those who made no shifts as a way of confirming the strength of mobility barriers in the industry. It is obviously important to focus the performance evaluation on some of the industry segments (general freight—LTL) identified in a preliminary way as either having mobility barriers or not (general freight—truckload).

## V. PERFORMANCE IMPACTS OF SHIFTS IN COMMODITY FOCUS

The objective of this section is to explore the existence of mobility barriers due to experience advantages by examining the performance impacts of a shift in commodity focus. To the extent that experi-

ence advantages exist in the industry, we anticipate that firms who changed their commodity focus between 1977 and 1985 would have higher costs, lower productivity, and lower profits than would firms who did not switch during the study period. Further insight on the impact of shifting commodity focus is gained by examining the profitability of firms who changed focus with that of the firms with the same primary commodity in 1977 who did not change.

There are three commodity groups with sufficient number of firms changing to their focus to allow for formal statistical comparisons. The performance impacts of these shifts in commodity focus are displayed in Table 3. First, carriers who switched their focus between 1977 and 1985 to the "other" specialized commodity segment outperformed "other" specialized carriers who held that focus throughout the study period. The firms for which this focus was new had statistically significantly lower costs (operating expenses per mile/ton-mile; line haul expenses per mile/ton-mile; and general and administrative expenses per mile/ton-mile), higher productivity (ton-miles/vehicle miles), and lower operating ratio and higher profits (net income/total assets). Thus, in the "other" specialized commodity sector, there appear to be no significant experience curve advantages. On the contrary, the firms with shifting focus are able to significantly outperform the stable firms across a wide range of key dimensions.

Similarly, carriers moving into the general freight (truckload) segment during the transition outperformed those who stayed in that segment throughout on key cost and productivity measures. Specifically, the carriers who did not shift focus had statistically significantly higher averages than did the "shiffters" on numerous cost measures (operating expenses per mile/ton-mile; line haul expenses per mile/ton-mile; general and administrative expenses per mile/ton-mile; traffic and sales expenses per mile). The carriers with a strategic change in focus had statistically significantly higher performance than did the non-shiffters in the following productivity categories: vehicle miles/vehicles and ton-miles/vehicle miles. Interestingly, however, despite the cost and productivity advantages, carriers with the new commodity focus did not have statistically significantly higher profits than did the non-shiffters. The explanation for this finding may lie in the highly competitive rate environment in this particular industry segment. Carriers with the new strategic focus may have passed along cost and productivity gains to shippers in the form of major rate discounts, perhaps, in an effort to establish market presence. Nonetheless, the results clearly substantiate the earlier indication of low mobility barriers in the general freight (truckload) segment. In addition to a high percentage of firms shifting out of and into the segment, the entering carriers have cost and productivity advantages over the non-shiffters.

Finally, turning to the third commodity, Table 3 reveals that there are no statistically significant performance differences between carriers who switched their strategic focus to general freight (LTL) carriers during the transition and those who stayed in this category throughout. These results though not as strong as the findings in the other two segments, also point to an absence of mobility barriers. If there were clear learning curve advantages from experience, the expectation is that the new entrants would have statistically significantly higher costs, lower

TABLE 3  
Performance Impact of Shifts in Commodity Focus

| <u>1985 Measures</u>                            | <u>Industry Segments</u>           |                                       | <u>Sig. of Diff</u> |
|---|------------------------------------|---------------------------------------|---------------------|
|   | <u>New "Other"<br/>Specialized</u> | <u>Stable "Other"<br/>Specialized</u> |                     |
| <u>Cost</u>                                     |                                    |                                       |                     |
| Operating Expense<br>Per Mile/Ton-Mile          |                                    | +                                     | ***                 |
| Line Haul Expense<br>Per Mile/Ton-Mile          |                                    | +                                     | **                  |
| General & Admin. Expense<br>Per Mile/Ton-Mile   |                                    | +                                     | *                   |
| Insurance & Safety Expense<br>Per Mile/Ton-Mile |                                    |                                       |                     |
| Traffic & Sales Expense<br>Per Mile             |                                    |                                       |                     |
| Maintenance Expense<br>Per Mile                 |                                    |                                       |                     |
| <u>Productivity</u>                             |                                    |                                       |                     |
| Miles Per Truck<br>Ton-Miles/Vehicle Miles      | +                                  |                                       | *                   |
| <u>Profit</u>                                   |                                    |                                       |                     |
| Operating Ratio                                 |                                    | +                                     | *                   |
| Net Income/Total Assets                         | +                                  |                                       | **                  |
|   | <u>New GF<br/>(LTL)</u>            | <u>Stable GF<br/>(LTL)</u>            | <u>Sig. of Diff</u> |

Cost  
Operating Expense  
Per Mile/Ton-Mile  
Line Haul Expense  
Per Mile/Ton-Mile  
General & Admin. Expense  
Per Mile/Ton-Mile  
Insurance & Safety Expense  
Per Mile/Ton-Mile  
Traffic & Sales Expense  
Per Mile  
Maintenance Expense  
Per Mile

Productivity  
Miles Per Truck  
Ton-Miles/Vehicle Miles

Profit  
Operating Ratio  
Net Income/Total Assets

\*\*\* Statistically significant difference of means at .01 level of confidence

\*\* Statistically significant difference of means at .05 level of confidence

\* Statistically significant difference of means at .10 level of confidence

The mean values and t-statistics are available on request from the authors.

TABLE 3 (continued)  
Performance Impact of Shifts in Commodity Focus

| <u>1985 Measures</u>       | <u>Industry Segments</u>      |                                  |                     |
|----------------------------|-------------------------------|----------------------------------|---------------------|
|                            | <u>New GF<br/>(Truckload)</u> | <u>Stable GF<br/>(Truckload)</u> | <u>Sig. of Diff</u> |
| <u>Cost</u>                |                               |                                  |                     |
| Operating Expense          |                               |                                  |                     |
| Per Mile/Ton-Mile          |                               | +                                | ***                 |
| Line Haul Expense          |                               |                                  |                     |
| Per Mile/Ton-Mile          |                               | +                                | **                  |
| General & Admin. Expense   |                               |                                  |                     |
| Per Mile/Ton-Mile          |                               | +                                | ***                 |
| Insurance & Safety Expense |                               |                                  |                     |
| Per Mile/Ton-Mile          |                               |                                  |                     |
| Traffic & Sales Expense    |                               |                                  |                     |
| Per Mile                   |                               | +                                | ***                 |
| Maintenance Expense        |                               |                                  |                     |
| Per Mile                   |                               |                                  |                     |
| <u>Productivity</u>        |                               |                                  |                     |
| Miles Per Truck            | +                             |                                  | ***                 |
| Ton-Miles/Vehicle Miles    | +                             |                                  | ***                 |
| <u>Profit</u>              |                               |                                  |                     |
| Operating Ratio            |                               |                                  |                     |
| Net Income/Total Assets    |                               |                                  |                     |

\*\*\* Statistically significant difference of means at .01 level of confidence

\*\* Statistically significant difference of means at .05 level of confidence

\* Statistically significant difference of means at .10 level of confidence

The mean values and t-statistics are available on request from the authors.

productivity, and smaller profits. These findings, however, indicate that carriers shifting their focus to the general freight (LTL) designation do not perform differently from the established, non-shifting carriers. Thus, the low levels of shifting out of and into the general freight (LTL) segment suggesting the existence of mobility barriers stemming from learning curve advantages are not substantiated by the performance results.

In summary, a switch in commodity focus does not appear to disadvantage a carrier, contrary to expectations based on the mobility barrier literature. In fact, the carriers who shifted out of the "other" specialized commodity segment between 1977 and 1984 had statistically significantly higher profits than did the carriers who remained in that segment throughout. There were no statistically significant profit differences between the carriers who changed their strategic focus from general freight (LTL) between 77 and 1985 and those who kept the same focus throughout. Likewise, there were no profit differences between the carriers who moved from

the general freight (truckload) segment during the transition and those who made no such change. The Table 4 results are consistent with the findings outlined in the discussion of Table 3, there appear to be no statistically significant cost, productivity, and profit advantages to be gained from experience. In all segments, carriers with a new strategic focus did no worse (and in two segments did significantly better) than did those who remained in the segment. The evidence found in this empirical investigation does not indicate mobility barriers across all segments in the motor carrier industry.

## VI. SUMMARY AND IMPLICATIONS

There do appear to be barriers associated with certain segments, such as petroleum products, as evidenced by the small number of firms moving into or out of this commodity. However, where sufficient movement has occurred to conduct formal statistical tests, the results do not substantiate significant cost,



TABLE 4  
Profitability Impacts of Shifts in Commodity Focus

| <u>1985 Measures</u>    | <u>Industry Segment</u>                      |                                       |                    |
|-------------------------|--|---------------------------------------|--------------------|
|                         | <u>Shifters from<br/>"Other" Specialized</u> | <u>Stable "Other"<br/>Specialized</u> | <u>Sig of Diff</u> |
| Operating Ratio         |  | +                                     | **                 |
| Net Income/Total Assets | +  |                                       | ***                |
|                         | <u>Shifters from<br/>Gen Frt (LTL)</u>       | <u>Stable Gen Frt<br/>(LTL)</u>       | <u>Sig of Diff</u> |
| Operating Ratio         |  |                                       |                    |
| Net Income/Total Assets |  |                                       |                    |
|                         | <u>Shifters from<br/>Gen Frt (Truckload)</u> | <u>Stable Gen Frt<br/>(Truckload)</u> | <u>Sig of Diff</u> |
| Operating Ratio         |  |                                       |                    |
| Net Income/Total Assets |  |                                       |                    |

\*\*\* Statistically significant difference of means at .01 level of confidence  
 \*\* Statistically significant difference of means at .05 level of confidence  
 \* Statistically significant difference of means at .10 level of confidence

The mean values and t-statistics are available on request from the authors.

productivity, and profit advantages to firms based on their accumulated "know how" or experience. In fact, the findings indicate that the decision by carriers to shift their product focus does not disadvantage them in any systematic way. Evidence developed in the paper shows that in several industry segments firms shifting product focus outperform both the carriers who had the same original product focus but did not make a product shift as well as the carriers who already had the product focus that the "shifters" selected in the latter period.

The industry's violative environment may explain why there is no consistent evidence of mobility barriers based on the experience curve in the motor carrier industry. Industry procedures and practices have changed radically in conjunction with the sharp reduction in regulation. It is perhaps not surprising in such an environment that past experience under regulation is not particularly advantageous for the stable motor carriers. The environment seems to

have favored carriers who were bold enough to shift their strategic focus to take advantage of market opportunities in segments where the established carriers failed to alter practices to adapt to the new environment.

This paper has identified the extent to which motor carriers have changed their commodity focus during the transition years and assessed the impacts of such changes. This research could be extended through examination of firms' rationale in switching commodity focus. Also specific decisions that enabled these aggressive firms to outperform carriers who made no changes in product focus should be evaluated.

Furthermore, the authors believe that a change in commodity focus is only one of many major strategic variables that should be evaluated. The authors intend to investigate other major strategic decisions such as geographic scope of operations. We believe a systematic assessment of key strategic variables

will yield much information about strategic management decisions in a dynamic regulatory environment.

#### REFERENCES

- Booz, Allen & Hamilton, "The Motor Carrier Executive Survey Report: Strategies for Success in the Motor Carrier Industry," June, 1984.
- Boston Consulting Group, *Perspectives on Experience*, Boston Consulting Group, Inc., Boston, MA 1972.
- Caves, Richard E., and Porter, Michael, "From Entry Barriers to Mobility Barriers," *Quarterly Journal of Economics*, 91, 1977.
- Corsi, Thomas M., Grimm, Curtis M., and Smith, Raymond D., "Motor Carrier Strategies in a Changing Environment: An Empirical Analysis," *Transportation Research Forum Proceedings*, 1986.
- Hambrick, Donald C., "Operationalizing the Concept of Business Level Strategy in Research," *Academy of Management Review*, 5, 1980, pp. 567-575.
- Hax, Arnoldo C., and Majluf, Nicolas S., "Competitive Cost Dynamics: The Experience Curve," *Interfaces*, Vol. 12, No. 5, October 1982, pp. 50-61.
- McGee, Michael, "Changing Market Structure for the For-Hire Motor Carrier," *Transportation Research Forum Proceedings*, 1980, pp. 12-17.
- Porter, Michael, *Competitive Strategy*, New York, Free Press, 1980.
- Tye, William B. "Fundamental Elements of a Marketing Audit for a More Competitive Motor Carrier Industry," *Transportation Journal*, Spring 1983, pp. 5-22.
- Walters, Timothy C., "Market Oriented Strategic Management for Motor Carriers," *Transportation Research Forum Proceedings*, 1985, pp. 554-558.

#### ENDNOTE

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