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ORGANIZATIONAL PERFORMANCE IN A REGULATED ENVIRONMENT: THE ROLE OF STRATEGIC ORIENTATION

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This study explores the influence of governmental regulation on organizational strategies and performance outcomes. Drawing on literature in strategic management, we provide a longitudinal empirical analysis of viable strategies in the U.S. domestic airline industry during a 6-year period (1965–70) when it was regulated by the Civil Aeronautics Board. Results indicate that air carriers were indeed able to articulate coherent strategic postures despite regulatory constraints, and were thus able to influence profitability.

The strategic choice perspective (Child, 1972) has spurred numerous investigations of the importance of managerial influence in various organizational and environmental contexts. Although several researchers have argued that the external environment limits the range of viable strategic options (Hambrick and Lei, 1985; Miller, 1987; Venkatraman and Prescott, 1990), recent studies have demonstrated that managers continue to be important arbiters of firm performance (Day and Lord, 1988; Govindarajan, 1989; Thomas, Litschert, and Ramaswamy, 1991). While these efforts have been carried out in a variety of settings, the role of strategic choice in regulated industries has been largely overlooked (Reger, Duhaime, and Stimpert, 1992). The pervasiveness of regulation both in domestic and international contexts demands greater research of its strategic implications. Toward this end, this study investigates the relationship between strategy[1] and performance in a highly regulated environment.

REGULATION, STRATEGY AND PERFORMANCE

Most previous examinations of government regulation have been based either on an economics or policy making perspective. Several economists have addressed critical issues such as the impact of regulation on market structure (e.g., Caves, 1962; Vietor, 1991), the significance of nonprice competition on public services (e.g., De Vany, 1975; Douglas and Miller, 1974; Jordan, 1970;

Key words: Regulation, airlines, strategy, prospectors, defenders, performance

[1] In this paper we use the terms strategy, strategic orientation and strategic posture interchangeably.

Kahn, 1970b), and the role of governmental control in fulfilling social objectives (e.g., Breyer, 1982; Kahn, 1970a). While these studies provide important insights into the evolution of industries during prolonged periods of regulation, they do not facilitate an understanding of firm specific strategies and outcomes in such contexts. As Vietor rightly observes, *'neither economic nor policy explanations take into account the strategic conduct of the firm or its surprising effects . . .'* (1991: 20). Given the dominance of industry level phenomena in most prior economic research, very little is known about how individual firms react to centrally administered environments and how they compete to achieve superior profitability. Thus, with a few notable exceptions the influence that regulation exerts on firm level behavior and performance is largely uncharted territory (see Keeler, 1972; Spiller, 1983).

Contrary to the approach of economists, strategic management researchers have begun examining the impact of regulation on organizational adaptation and performance, emphasizing the individual firm as the unit of analysis. Since this stream of inquiry is still in its infancy, a middle-range theory of regulation and its influence on organizations is yet to emerge. Snow and Hrebiniak (1980) were among the first to examine the influence of regulation on strategic conduct. Their study of the air transport industry indicated that while the majority of firms (approximately 69 percent) adopted focused strategies even during regulation, organizations without any clearly identifiable strategy tended to achieve better performance. Although the study was carried out over a decade ago, very few researchers have sought to build on these results. Instead, some studies have theorized that the articulation of strategies in regulated industries is difficult if not impossible (e.g., Mahon and Murray, 1980; 1981) while others have focused mostly on the process by which firms respond to environmental turbulence that accompanies deregulation (e.g., McDaniel and Kolari, 1987; Smith and Grimm, 1987; Zajac and Shortell, 1989). Thus, we do not have an adequate understanding of the manner in which regulated organizations make strategic choices that drive performance outcomes. We argue that this issue warrants further empirical examination as it is an important determinant of the range and variety of future efforts which study regulation and its impact.

This empirical examination builds on Snow and Hrebiniak (1980), alleviating many shortcomings of the original effort. We suggest that the findings of Snow and Hrebiniak (1980) should be interpreted with caution for several reasons. First, the examination of the impact of regulation was only a peripheral issue in their study. Second, the time frame (1975–76) could have biased the findings because most carriers were aware of impending deregulation by 1975 and were actively preparing for the anticipated turbulence (Bailey, Graham and Kaplan, 1985; Spiller, 1983; Vietor, 1991). This period of flux could have prompted some managers to report their organizations' intended strategy rather than the realized strategy. Further, the study measured performance only for one year using a single indicator. In combination, these factors limit the generalizability of findings reported. In the following sections we explore the relationship between strategy and performance in the regulated airline industry. By choosing a longitudinal time frame and multiple objective measures of strategy and performance, this study seeks to directly address the following question:

Is there a significant relationship between strategy and performance in regulated settings?

SAMPLE AND SETTING

The sample for the study included 20 certified air carriers made up of all 10 domestic trunk airlines and 10 large regionals (as defined by the Civil Aeronautics Board) operating within and between the 50 states of the United States. Their domain primarily encompassed medium and large communities over routes that had relatively high traffic volume accounting for close to 88 percent of passenger revenues during the period (Taneja, 1976; Wyckoff and Maister, 1977). Carriers serving intrastate routes (e.g., PSA, Southwest) were excluded since they were not subject to CAB control.

The time frame chosen for the study spanned six years from 1965 to 1970. This period was deliberately selected as it represented a particularly stable era in the industry. Stability was an important prerequisite because nonrandom environmental variations could bias findings. His-

torical and statistical analyses of the industry during this period validate our choice. The Chronologies of Air Transport Events reported that the regulations enforced by the Civil Aeronautics Board (CAB) remained relatively unchanged during this period. The CAB imposed a 'route moratorium' and refused to authorize significant route expansion during that time. Only 10 percent of all new route applications by existing carriers, mostly for marginal route expansion, were granted (Breyer, 1982). Thus, from a regulatory standpoint, the industry environment remained fairly static during the 6-year period (1965–70).

While the regulatory context remained calm, the economic landscape began to change significantly in 1970. At a time when most of the airline companies had completed the transition to jet fleets, growth in demand for air transport began to drop, declining from an average of 18 percent (1965–69) to 4 percent between 1970–75 (Vietor, 1991) triggering a Domestic Passenger Fare Investigation in 1970. Further, load factors (an indicator of capacity utilization in the airline industry) dropped to an all time low of 48 percent in 1971 (CAB, 1975; Vietor, 1991). The early 1970s also witnessed significant increases in fuel prices due to the oil embargo driving the industry to seek alternative ways to combat the resulting increases in operating costs. However, since most of these economic shocks occurred either in 1970 or the years that immediately followed, we had reason to believe that our choice of time frame (1965–70) would not unduly influence the findings.

This conclusion is supported by the fact that there were no statistically significant variations in ROI (Return on investment), operating costs and load factors during the 1965–70 period (see Bailey *et al.*, 1985; CAB, 1975). The stability of the time frame was also validated empirically through a test of equality of successive variance–covariance matrices (Cool and Schendel, 1988). Taken together, the anecdotal and statistical evidence indicated that findings would not be biased by extraneous influences that might have prevailed during the period.

MEASURES

Since the objective of the study was to capture actual, realized strategies, objective secondary data were used to define strategy and its outcomes. All the data were obtained from the Handbook of Airline Statistics published by the CAB. The standardized reporting procedures adopted by this regulatory agency ensured the reliability of data and also facilitated comparability across firms over time.

Strategic-orientation

The Miles and Snow (1978) typology is a framework that provides a rich description of organizational behavior comprising key elements of strategy, structure and process. This typology has also been the subject of extensive theoretical and empirical examination over the last decade (e.g., Hambrick, 1983; McDaniel and Kolari, 1987; Shortell and Zajac, 1990). In an evaluation of its reliability and validity, Shortell and Zajac concluded that 'researchers can use the typology with increased confidence in future work on organizations and their strategies' (1990: 830). Since it was also used by Snow and Hrebiniak (1980) to assess the relationship between strategy and performance, the Miles and Snow typology was a particularly appropriate framework for the conceptualization of strategy.

Miles and Snow identify three viable strategies, Prospectors, Analyzers and Defenders. While Prospectors and Defenders are maximally different forms, Analyzers are essentially hybrid strategies that exhibit some features of both. Prospectors are externally oriented organizations that compete by developing new products and services. Therefore, they focus primarily on external, market factors such as advertising and sales promotion to build sustainable competitive advantage. In contrast, Defenders are internally oriented and emphasize penetration of existing markets through improvements in operational efficiency. Consequently, a tight control over costs, and achieving high levels of capacity utilization are critical features of this strategy.

In the following section the measures developed to capture the dimensions of strategy in the regulated airline industry are described. The discussion encompasses two distinct sets of measures, those that were managerially controlled and others that were controlled by the CAB. The managerially controlled indicators define the characteristics used to distinguish Prospector and Defender orientations. The CAB controlled measures are intended to capture the extent of

regulatory control exerted by this federal agency over significant dimensions of competition in the airline industry.

Indicators of a defender orientation

Direct maintenance expenditure (DMTEX). Maintenance expenditures were significant determinants of airline efficiency as they were directly related to fleet utilization. Managers were able to enhance utilized capacity by investing in maintenance beyond mandatory safety requirements to ensure that their fleets were fully functional at all times. This also decreased overall operating costs since it reduced aircraft downtime. A ratio of direct maintenance expenditure per revenue ton mile (DMTEX) was used as an indicator of an organization's emphasis on efficiency through fleet maintenance.

Aircraft service expenditure (ACSERV). Aircraft service expenditures included the costs of airport ticket counter operations, baggage handling, flight check-in, landing and parking fees, etc. Managers could increase the efficiency of operations by controlling and streamlining these expenditures. Thus, aircraft service expenditures per revenue ton mile was used as an indicator of a Defender orientation.

Schedule completion rate (SCRT). Airline companies that either had older fleets or poor maintenance facilities invariably tended to have lower schedule completion rates (Douglas and Miller, 1974). Since managers had complete discretion over the replacement of aircraft and the proportion of resources devoted to fleet maintenance, they could increase schedule completion rates by improving the quality of their fleet. Hence, this was used as a managerially controlled indicator of a Defender orientation.

Total revenue load factor (TRLF). Even during regulation, managers had complete control over flight frequency and scheduling. Thus they were able to manipulate these critical variables to recover fixed costs such as hangar fees and hull insurance more efficiently (Taneja, 1976). Total revenue load factor (a ratio of available seat miles to utilized seat miles) was used as an indicator of managements' ability to increase

capacity utilization through optimal flight scheduling.

Flight operation expenditure (FOPEX). Flight operation expenditures typically include costs associated with the operation of the aircraft such as hull insurance, wages and benefits for the flight crew and fuel. Managers could control flight operations expenditure by investing resources in automated ground support equipment, fuel efficient fleets, and limiting costs associated with the ground crew. Therefore, a ratio of flight operation expenditure per revenue ton mile was used to capture the competence of top managers in promoting efficiency and cost control in aircraft operations.

Capital expenditures—fleet equipment (CAPEX). Managers had substantial control over capital expenditures to acquire new aircraft and related flight equipment (Bailey *et al.*, 1985; Breyer, 1982; Kahn, 1970b). During 1965–70 several air carriers such as American, Delta and United invested in large jet aircraft with greater seating capacities and lower operating costs per hour (see Fradenburg, 1980; Vietor, 1991; Wyckoff and Maister, 1977). The decreases in operating costs averaged 17 percent (see Taneja, 1976) making it lucrative for companies that emphasized efficiency as an avenue to competitive advantage. Hence, a ratio of incremental investment in fleet and related equipment per revenue ton mile was used to measure an organization's ability to maximize efficiency through optimal capital expenditure decisions.

Indicators of a prospector orientation

Passenger service expenditure (PASERV). Despite the web of regulatory influence, air carriers were able to distinguish their services by offering different combinations of seating arrangement (first class vs. coach), and other on-board extras such as gourmet meals, liquor and in-flight movies. Therefore, a ratio of total passenger service expenditure per revenue passenger mile was used as a measure of service differentiation.

First class service (FCRPM). The proportion of first class revenue passenger miles to total passenger miles flown was used as an indicator of

differentiation through an emphasis on premium service. Although the CAB certified an air carrier's route structure, the proportion of first class and coach seating was entirely under the control of top managers. While some airlines (e.g., Allegheny, Frontier) had a large first class section on their long haul flights, others (e.g., Delta, Piedmont) focused on drawing cost conscious travellers by increasing coach class seating.

Service emphasis (SEMP). Since regulation ensured uniform price structures, airline companies were prohibited from fare competition. Therefore they attempted to broaden their customer base by advertising their commitment to superior service. For example, Delta claimed to be the most professional airline in the business while TWA touted its cabin service. Other carriers such as Northwest reflected their service orientation by offering a variety of distribution channels and reservations systems for ticket purchases. Emphasis on service was therefore measured as a ratio of advertising, sales promotion, ground and in-flight passenger service expenditures per revenue passenger mile.

Promotion expenditures (PROEXP). Although the CAB set upper limits (approximately 10 percent to 11 percent of sales) on sales promotion, companies had complete control over the actual expenditures within this range. For example, firms like TWA spent heavily on promotion (11.3 percent of sales) while others such as Piedmont were relatively more conservative (7.5 percent of sales). Managers were also free to choose between alternative media to maximize exposure per unit of expenditure. Thus, while some like Delta spent a large proportion of their already meager promotion budget on newspaper and radio advertising, typified by higher exposure levels per dollar, others like Northwest invested considerable amounts in television advertising, a media that was considered expensive even at that time. A ratio of promotion expenditure per revenue passenger mile was used to measure a carrier's focus on promotion activities.

Indicators of CAB control

Yield (YIELD). In the domestic airline industry, the CAB played a significant role in influencing fares. All carriers were required to file complete details about their rates, fares, and charges for air transportation. The CAB was empowered to reject tariffs that were not consistent with the Board's requirement. Combined with the regulatory agency's control over maximum profit levels, this practice predetermined the effective yield any carrier could achieve (Taneja, 1976). Since the applications to the CAB for changes in fare structures were routinely published, all the carriers in the industry became aware of impending changes and reacted accordingly. As a result, fares on a particular route were invariably uniform across carriers. A ratio of revenue generation per complete ton mile was used to capture the scope of regulatory control over prices.

Length of Haul (ROUTE). Since the CAB was responsible for awarding the 'certificate of public convenience' which was necessary for an air carrier to commence operations on a new route, it effectively set limits on the average length of haul for each carrier in the industry. Overall flight stage length (i.e., average route distance flown), was used to measure the extent of CAB control over route decisions.[2] This indicator was a proxy that characterized differences in route structures (long haul vs. short haul).

Subsidy (SUBSI). The CAB provided airline companies strong incentives to service inherently unprofitable routes by awarding federal subsidies. Subsidies were computed by forecasting the funds needed to operate the route and included a 'reasonable' rate of return and income taxes (Taneja, 1976). Thus, carriers did not have to achieve significant efficiency in operating subsidized routes. This aspect of regulatory control was measured through a ratio of federal subsidies per completed aircraft mile.

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[2] While this indicator effectively captures the distinction between air carriers flying long haul routes and others serving short haul routes, it does not account for factors such as differences in traffic densities between routes. In order to account for such differences, the analysis would have to be performed at the level of individual city pairs, an approach that dramatically reduces sample size and eliminates the possibility of drawing meaningful statistical conclusions.

Performance

Financial performance was measured in terms of two indicators, Return on Assets (ROA) and Return on Total Capitalization (ROTC). Accounting measures of performance are often criticized as they are vulnerable to differences in accounting practices and tax laws. These problems were not a significant factor in the airline industry prior to deregulation as uniform reporting practices were enforced by the CAB. It must be noted that the use of financial measures such as ROI could accentuate short run performance rather than measure long term financial health. However, since the study included a 6-year period, it was believed that any undue bias in favor of short-run performance would be minimized.

ANALYSIS

Step 1: Explaining variance in performance

In order to establish the presence or absence of a strategy–performance linkage, it was first necessary to evaluate the relative importance of managerial control (strategic choice) and regulatory control. Five indicators of managerial discretion (DMTEX, SCRT, PASERV, FCRPM and CAPEX) and three indicators of CAB control (YIELD, ROUTE, and SUBSI) were regressed against the two performance measures (ROA and ROTC). To eliminate the order effect, a stepwise multiple linear regression methodology was adopted.

Annual firm level data for the period 1965–70 were aggregated for the analysis. Although pooling data could violate some of the assumptions underlying least squares regression, the approach is defensible in this study because, (a) any individual firm accounted for less than 5 percent of the total observations used in the analysis, and (b) tests of auto-correlation confirmed that the errors were uncorrelated. Similar approaches have been previously used for the analysis of strategy data (see Eisenhardt and Schoonhoven, 1990; Hatten, Schendel, and Cooper, 1978). As can be seen from Table 1, the critical aspects of competition controlled by top managers explained 33 percent and 38 percent of variance in ROA and ROTC respectively. While all the managerially controlled factors

were significantly related to performance, none of the CAB controlled factors were significant. The effect size estimates further underscore the important role of managers during regulation. Managerially controlled factors had an effect size (0.61–0.64) that was roughly three times greater than that of CAB controlled factors (0.13–0.16). In combination these results suggest that despite the extensive controls exerted by the CAB, managers were still able to juggle competitive factors to increase their profitability.

The lack of any detectable CAB influence on firm profitability is significant.[3] Several economists have debated whether the CAB's route award policy enabled some larger carriers (with 'grandfathered routes') to take advantage of lower operating costs resulting from longer flight distances that could translate into higher profitability (see Douglas and Miller, 1974; Jordan, 1970; Kahn, 1970b). Others have suggested that large carriers were able to cross-subsidize their short haul routes using the abnormal returns they obtained from flying longer routes (see Bailey, Graham, and Kaplan, 1985; Breyer, 1982; Vietor, 1991). The results however do not provide any evidence that CAB control over price or route structure influenced organizational profitability in any way. Perhaps, as Taneja observes 'not enough is known about costs and cost allocation techniques within the industry to set fares appropriate to recover costs on a route-by-route basis' (1976: 41). Further, since it was a clear objective of the CAB to homogenize profitability among carriers at the industry level, its influence on individual firm performance might not be readily apparent.[4] However, it would be erroneous to conclude that the CAB was a powerless regulatory agency. Its influence on individual firms, albeit less visible, was a key determinant of the success and failure of alternative strategic postures.

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[3] These results support Stigler and Friedland (1962) who contended that regulation does not have any discernible effect on individual firms that operate in the industry. In their study of regulated public utilities they found that state regulatory commissions had no measurable effect on the utility companies.

[4] We are grateful to an anonymous SMJ reviewer for pointing this out.

Table 1. Regression analysis explaining variance in performance[a]

Measure	ROA	ROTC
Managerially controlled factors		
DMTEX	1.4372***	3.8923***
SCRT	0.8354**	1.7370*
PASERV	−4.1818***	−12.9847***
FCRPM	0.0510*	−0.2012*
CAPEX	0.0072	0.0156
CAB controlled factors		
YIELD	0.1220	0.3344
ROUTE	0.0153	0.0192
SUBSI	−0.1032	−0.4601
F	11.274***	9.565***
R^2	0.38	0.33
η (Manager Controlled Factors)	0.64	0.61
η (CAB Controlled Factors)	0.13	0.16

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] $N = 120$ observations

Step 2: Evaluating the strategy–performance linkage

Classifying organizational strategies: Cluster analysis

Having established a linkage between strategy and performance even under conditions of regulation, the next step in the analysis examined the relative effectiveness of alternative strategic postures. Toward this end cluster analysis was used to determine the strategic orientation of the air carriers in the sample. A criterion set comprising five measures of Prospector and Defender strategies (DMTEX, SCRT, PASERV, FCRPM and CAPEX) was used to derive the clusters. The centroid method recommended by Harrigan (1985) was used to develop the cluster solution. Determination of the optimal number of clusters was based on sharp variations in fusion coefficients (Everitt, 1980), visual inspection of dendrograms, and increases in variance explained at successive stages of clustering (Morrison and Roth, 1992). The process was repeated using two other algorithms, complete linkage and average linkage, both of which produced configurations similar to the centroid method. Such convergence of results can therefore be interpreted as an indication of the structural stability of the groupings (Klastorin, 1980). A stable three cluster solution was thus derived. One of the clusters made up of only three regional carriers was dropped because the small cell size precluded meaningful statistical analysis. Subjective analysis of this group indicated that the firms could be classified as Reactors or Analyzers. However, a definitive classification was not possible given the inability to employ statistical methods. We did not believe that dropping these firms would significantly alter our findings because our objective was to limit the empirical analysis to the maximally different forms of strategic orientation, Prospectors and Defenders.

A second group of variables (TRLF, ACSERV, PROEXP, SEMP) also representing the Prospector and Defender orientation was used to confirm the validity of the cluster solution. Analysis of variance was used to identify significant mean differences in strategy attributes of the two clusters. This process helped identify a Prospector group ($n = 8$) which exhibited greater attention to attributes such as service and promotion and a Defender group ($n = 9$) characterized by a focus on capacity utilization and efficiency.

*Validating organizational strategies: Content
analysis and anecdotal evidence*

As a confirmatory test, content analysis, was
performed to validate the cluster groupings. Two
strategic management researchers were asked to
review air carrier case studies (Fradenburg,
1980), and news clippings collected from journals
such as *Fortune* and *Business Week* during the
1965–70 period. They were asked to classify the
firms in the sample based on the descriptions of
the strategies adopted by these firms as discussed
in the business press. The analysts who were
familiar with the Miles and Snow (1978) typology
assigned each of the firms ($n = 17$) a dominant
strategy. While it is not feasible to discuss
detailed anecdotal evidence in support of the
strategy classification obtained for every single
firm, a few examples are provided below.

TWA (classified as a Prospector) had numerous
'firsts' to its credit. It was the first major airline
to completely switch to jet aircraft, first to offer
transatlantic all-cargo flights, first to order
supersonic jets, and first to install its own over-
ocean computerized flight planning. It
implemented an aggressive promotion campaign,
'Up, up, and away with TWA' to usher in its
new jet fleet. It was among the few carriers that
pioneered the concept of lounges aboard wide-
bodied jets meant to provide a premium service
for first class passengers. Its emphasis on customer
service was further exemplified by an automatic
ticketing system that was considered to be
the best in the industry (Fradenburg, 1980).
Continental is another airline that fits the
description of a Prospector. Its introduction of
a 'Director of Passenger Service' mirrors its
dedication to customer service, a defining feature
of Prospectors. The designated director traveled
on board all Continental flights and was author-
ized to sell tickets, collect excess baggage
payments, arrange for hotel and rental car
reservations in-flight, and call ahead to make
any special arrangements that passengers desired
(Continental Annual Report, 1971). This reduced
the long waiting times that customers encountered
at the check-in counters and provided them with
unmatched flexibility in making their travel plans.
The proactive behavior of TWA in being first,
and Continental's attention to customer service
are completely consistent with a Prospector
strategy as defined by Miles and Snow (1978).

The content analysis revealed patterns of
Defender behavior as well. Delta (classified as a
Defender) emphasized its focus on cost efficiency
by avoiding the costly frills of air travel such as
in-flight movies, cocktail lounges and extravagant
gourmet meals. Its wide-bodied jets were con-
figured to seat 370 passengers while its competi-
tors were using 305 seats. This significantly
increased its profit margins per flight. Further,
its labor costs were significantly lower than the
competition because most of its workforce was
nonunionized. Even its executives were paid
much lower salaries than their counterparts in
other companies. It compensated for these frugal
policies by offering job security and implementing
a 'promotion from within' approach to fill
managerial positions. These actions are typical
of Defender firms. Another example of such cost
consciousness is provided by Piedmont. This air
carrier made a significant decision to standardize
its aircraft engines, purchasing Nihon YS-11
aircraft, considered by industry experts to be the
cheapest to maintain and operate. This choice
also had the additional advantage of very
inexpensive financing alternatives. While most
other firms were leasing their fleets at tremendous
expense, Piedmont decided to finance its fleet
acquisitions through low interest debt. Since the
company continued to operate its fleet long after
the debt was retired, it provided significant cost
savings in terms of depreciation and interest.
Taken together, the efficiency oriented behavior
of both Delta and Piedmont characterize the
Defender strategy.

*Measuring convergence: Cluster groupings and
content analysis results*

In order to obtain an objective estimate of the
degree of convergence between the strategy types
obtained through content analysis and those
classified by the clustering procedure, we corre-
lated the results of the two methods. There was
significant agreement evidenced by a fairly high
correlation ($r = 0.87$, $p < 0.0001$). In 14 of the
17 cases analyzed, the results were exactly the
same. There was one case of disagreement and
two others where the content analysts felt that
they did not have sufficient information to classify
the firms' strategies. Thus, we were able to
identify distinctive strategy groups, validating
the classification through multiple nonrelated

methods. The strategy classification obtained did not indicate any bias toward larger firms. Both domestic trunks and large regionals were divided almost evenly between the Prospector and Defender groups. While the Prospector group had four domestic trunks and four large regionals, the Defender group had six trunks and three regionals (see Table 2). Thus it can be concluded that the route structure of the carrier (long haul trunks vs. short haul regionals) did not have any significant observable influence over organizational strategy.

The mean performance parameters of the two groups of firms pursuing distinctly different strategies were then compared to identify whether one strategy performed better than the other (see Table 3).

As shown in Table 3, the Defender firms performed significantly better on both ROA and ROTC. The air carriers following a Prospector strategy reported relatively lower performance.

DISCUSSION

The results indicate that in regulated contexts, (a) managerially controlled strategic resource deployments explained a significant proportion of variance in performance, and (b) organizations pursuing efficiency oriented strategies outperformed others that did not.

These findings challenge prevailing notions which suggest that organizations functioning in regulated contexts will be unable to achieve sustainable competitive advantage given the extent of regulatory control of competitive

Table 2. Strategic orientation of air carriers

Prospector group	Defender group
Continental (T)	American (T)
National (T)	Eastern (T)
Northwest (T)	United (T)
TWA (T)	Braniff (T)
Alleghany (R)	Delta (T)
Frontier (R)	Western (T)
North Central (R)	Ozark (R)
Southern (R)	Piedmont (R)
	Air West (R)

T: Indicates domestic trunk carrier as defined by the CAB.
R: Indicates large regional carrier as defined by the CAB.

Table 3. Analysis of variance validating cluster configuration[a]

Measure	Defender cluster	Prospector cluster	F-value
Criterion Set[b]			
DMTEX	0.1250	0.1146	5.47**
SCRT	0.9751	0.9464	2.82**
PASERV	0.0495	0.0539	7.75**
FCRPM	0.4049	0.6069	9.58***
CAPEX	1.2279	1.0885	2.04
Validation Set[c]			
TRLF	46.8367	41.7056	29.13***
ACSERV	0.2108	0.1963	4.18**
PROEXP	0.0679	0.0798	13.42**
SEMP	0.3990	0.4600	2.83**
FOPEX	0.1700	0.4151	5.11**
Profitability[d]			
ROA	0.0490	−0.2004	9.33***
ROTC	0.1300	0.0958	2.79**

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] Cluster solutions were obtained using moving averages for each firm over the 1965–70 period.
[b] These were the only measures used to derive the clusters.
[c] These were used only as external validation measures to validate the cluster configuration.
[d] These measures of profitability were not used to derive the clusters. They were used to examine differences in performance between the clusters following their validation.

dimensions (e.g., Mahon and Murray, 1980, 1981; Smith and Grimm, 1987). Even though the CAB exercised significant influence over the air carriers by controlling several key factors such as routes and fares, it appears that the profitability of an air carrier was ultimately determined by organizational leaders. Although top managers in the regulated airline industry did not have recourse to the variety of competitive weapons available to their counterparts in nonregulated contexts, they exercised their strategic choice by manipulating the limited set of weapons in their control.

The superior performance of Defenders provides further insight to the avenues that top managers use to compete in regulated industries. Perhaps, the managers of firms focusing on efficiency and cost control had a wider range of competitive attributes like capacity utilization, scheduling, and fleet maintenance that could be effectively manipulated in reducing overall operation costs. The regulated context might have provided the most suitable environment for

implementing such cost oriented strategies. For example, during the period 1960–69, the cost per seat mile declined by 21 percent due to enhancements in fleet efficiency. However, the fares fell only by 7 percent over the same period (see Bailey *et al.*, 1985) thus providing adequate incentive for firms to hold a tight control over costs. Further, the 'rate-setting lag' in force at the time might have been particularly influential in encouraging efficient production (Bailey and Coleman, 1971; Kahn, 1970a). As Breyer observes, '*If prices set in one year remain in effect for at least three or four years, the firm is able to keep any extra profits earned in the interim. Thus it will lower its costs to generate extra profit*' (1982: 48). It could therefore be argued that the air carriers pursuing a Defender strategy took advantage of these 'rate-setting lags' in order to achieve superior profitability.

The most significant aspect of efficiency oriented competition in the airline industry is reflected in the load factors that carriers were able to achieve. Since a significant proportion of the direct operating costs (e.g., hull insurance, landing fees, hangar fees, fuel costs) are fixed once a flight is scheduled, a carrier that manages to fill the maximum amount of seats will recover better profits. Industry analysts at the time estimated that close to 90 percent of a passenger's ticket price covered costs that would have been incurred even if the passenger did not travel (Wyckoff and Maister, 1977). This underscores the tremendous advantage that could be obtained from increasing load factors (see De Vany, 1975; Spiller, 1983). Some researchers observe that a difference of one percentage point in load factors could lead to a profitability difference as high as five percentage points (Wyckoff and Maister, 1977: lxii). Although the results reported in this study do not indicate such a dramatic profit differential, it must be noted that the Defender group achieved load factors that were roughly 5 percent greater than the Prospector group, translating into significantly better profits (Incremental ROA: 7 percent; ROTC: 4 percent).

In contrast, it appears that their counterparts in organizations pursuing Prospector strategies could not exercise sufficient control over all critical factors such as price and service variety that are important in successful implementation of the strategy. Since they are primarily market oriented and rely on product innovation and domain expansion activities, both largely controlled by the CAB, the articulation of a Prospector strategy in such a setting might have been difficult. For example, Prospector firms in the industry attempted to emphasize their service orientation by offering more comfortable seating on their aircraft and often increased the number of first class seats available on a flight. These offerings were provided at considerably higher cost. As Breyer illustrates, the operating costs per revenue passenger mile incurred in using an 'all coach' configuration were approximately 10 percent lower than mixed seating arrangements which provided first class seating thus reducing the total number of seats flown (1982: 203). The attempt to provide exclusive services such as electronic draw poker machines, magicians, musicians and Polynesian bars (Breyer, 1982; Jordan, 1970; Vietor, 1991) increased the costs of operations considerably. The ineffectiveness of this strategy is reflected by the fact that passengers on unregulated intrastate routes preferred carriers such as PSA that offered much better fares but poorer service quality (Breyer, 1982; Jordan, 1970). It is thus apparent that the use of innovative customer services and promotional techniques did not increase load factors to a level necessary to cover the expenses associated with these activities. Taken together, the regulated environment during this period seems to have provided the efficiency oriented firms a much wider range of opportunities to achieve profitability levels that were greater than the innovative, marketing oriented carriers.

Capital expenditures related to fleet and equipment was the only measure that was not significant both in the regressions as well as the analysis of variance. In keeping with the contention of Miles and Snow (1978), the Defender group had a higher level of capital expenditure than Prospectors, although the difference was not statistically significant. Perhaps this is because both Prospector and Defender firms invested in new fleets although they had entirely different objectives. The Prospector carriers introduced new aircraft to provide the passengers better cabin room and service to attract comfort conscious travellers. Factors such as reduction of engine noise and smoother travel appeared to be important to the passengers that these carriers were attracting (see Breyer, 1982; Douglas and Miller, 1974). Contrarily, Defender airlines

invested in new fleets simply to take advantage of operational efficiencies that jet aircraft provided. They preferred wide bodied jets because they could be configured to carry a large number of coach class travellers, their target market. More importantly, their operating costs per block hour were significantly lower, thus making them a very good choice for the cost conscious Defender firms (see Taneja, 1976; Wyckoff and Maister, 1977). Thus, in the airline industry, distinguishing strategy types based on firm specific capital outlays might have to be complemented by a detailed examination of the reasons behind the investment rather than the volume of such expenditure.

In summary, the results support the contention that firms in the regulated airline industry were indeed able to implement coherent strategies in order to achieve superior profitability and that efficiency oriented Defender organizations seemed to perform better than those pursuing Prospector strategies. It would be beneficial to build on these results to examine the role of intercarrier rivalry in each of the major city-pair markets in determining strategic choice. Firm specific strategic changes following deregulation would be another critical issue warranting further examination especially since the sources of economic rents in the deregulated context were quite different from those prevalent in the regulated era (see Bailey and Williams, 1988).

CONCLUSIONS

This study is among the first few to systematically examine the relationships between strategy and performance in a regulated industry from a strategic management perspective. It provides a platform for future research on the impact of regulation on organizational strategies, processes and outcomes. In building a broadly applicable theory of regulatory control, several key questions must be addressed. For example, it is necessary to examine whether the range of viable strategies is limited by the level of regulatory control exercised, whether the *type* of regulation (social vs. economic) plays a role in determining profit potential, and whether some managers are better equipped to handle the challenges of regulation than others. It is our hope that this study will provide the impetus for such examinations.

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