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AN EXPLORATORY INVESTIGATION INTO STRATEGIC GROUPS AND STRATEGIC BLOCKS AS AN EXPLANATION FOR PATTERNS OF RIVALRY IN THE INTERNATIONAL AIRLINE INDUSTRY

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An Exploratory Investigation into Strategic Groups and Strategic Blocks as an Explanation for Patterns of Rivalry in the International Airline Industry

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ABSTRACT

Strategic groups and strategic blocks offer alternative approaches to understanding patterns of intraindustry rivalry. Strategic groups have traditionally been conceptualised in terms of scope and resource commitments, whereas strategic block theory clusters firms together on the basis of the density of interorganisational linkages. This paper empirically tests the relative utility of the concepts of strategic groups and strategic blocks in the interpretation of patterns of rivalry across a number of international airline routes, ex-Australia. The findings suggest that both conceptual tools offer insight into the patterns of rivalry evidenced in the industry, however the number of strategic groups present on each route served as the better predictor of the degree of rivalry.

INTRODUCTION

The ready acknowledgment that competition within industries is not homogeneous has prompted considerable research efforts to discern patterns of intraindustry rivalry. One such sphere of this work has been the concept of strategic groups, which signify collections of firms within an industry that have in common resource and scope characteristics (Cool & Schendel, 1987). This analytical construct has been utilised to investigate a variety of firm and industry specific concerns, including rivalry.

To date, much of the research concerning the strategic group – rivalry relationship has been the empirical examination of the hypothesis posed by Caves and Porter (1977), that rivalry will be greater between firms from different strategic groups as opposed to firms within the same group. Despite the relative longevity of this proposition, it remains a contentious issue in the strategic group literature, due in large to the inability of research to develop conclusive evidence either in support or disagreement of the hypothesised relationship between strategic groups and rivalry. The lack of consistent results is most likely the result of a variety of different approaches being used to construct strategic groups¹ and the fact that intraindustry patterns of competition vary greatly, making the existence of groups relatively inconsequential in certain industries. Whilst more studies have found support for the Caves-Porter hypothesis regarding patterns of rivalry and strategic groups than have refuted it or been non-committal, the effectiveness of strategic groups in explaining patterns of rivalry is certainly not perfect and therefore this study seeks to pit the strategic groups concept against an alternative intraindustry clustering tool, strategic blocks, in a test of their relative utility.

Whereas strategic groups have traditionally been conceptualised according to scope and resource commitments (Cool & Schendel, 1987), a more recent approach to the study of interfirm dynamics within an industry has emerged in the form of strategic blocks. Strategic blocks are recognised as sets of firms that exhibit denser strategic linkages amongst themselves than other firms within the same industry (Garcia-Pont, 1992). The underlying idea behind the strategic blocks concept is that firms that engage in alliances with other firms within an industry will take into account these alliances in terms of their competitive strategy. The result is that where a group of firms are closely linked through a dense network of alliances, they are unlikely to behave in the same way competitively as they would if these

¹ The problems associated with strategic group formation are well illustrated in the paper by Nath and Gruca (1997) whereby the authors, in an attempt to validate the strategic group concept, use three different group construction methods in an attempt to demonstrate that strategic groups are more than just a natural grouping in the data (as suggested may often be the case by Barney and Hoskisson (1990)).

alliances did not exist. The idea that a network of alliances within a cluster of firms creates a strategic network has gained acceptance on the basis of work done in the development of network theory (Garcia-Pont & Nohria, 2002; Gulati, Nohria & Zaheer, 2000). And given the proliferation of these strategic networks in recent decades, it is entirely plausible that through appreciation of these strategic blocks, patterns of rivalry may be better understood. However, as yet, no research has effectively utilised the strategic block approach in the study of intraindustry rivalry.

In testing the utility of the strategic group and strategic block concepts in explaining patterns of rivalry, we have chosen the international airline industry. The airline industry has been a popular choice for previous strategic group studies (e.g. Peteraf, 1993; Smith, Grimm, Wally & Young, 1997) because it allows for access to timely data in terms of participants and their competitive actions. From a strategic block perspective, the airline industry is also an appropriate industry as airlines can be easily clustered into strategic networks such as the Oneworld alliance, the Star alliance and Sky Team making the establishment of strategic blocks relatively uncomplicated. Rivalry remains a difficult construct to measure and rather than adopt a multi-dimensional measure, for the purposes of this study we have used a uni-dimensional measure relating to the level of price discounting (as the most overt manifestation of rivalry within this industry).

The primary contribution of this paper is to offer a comparative assessment of the relative utility of the strategic group and strategic block rationale in explaining patterns of rivalry at a theoretical and empirical level. To do this, we first introduce a theoretical review and comparison of the strategic group and strategic block concepts. Drawing upon this material, we develop our central research question and present our research methods. The final major section of the paper provides the results of the research and our discussion concerning these results.

THEORETICAL BACKGROUND

Whilst much of the research today in strategy, and indeed much of the focus by practitioners, may effectively occur within the resource based view (RBV) of the firm perspective, there continues to be an implied focus on 'fit' whereby strategy formulation includes the deployment of resources and capabilities in a manner that can lead to a competitive advantage given the external environment facing the firm. Understanding this external environment therefore becomes a critical element within strategy formulation, and this includes an understanding of the different sub-sets of firms and the way that they compete

within a particular industry. To this effect, an appreciation of the different strategic groups/strategic blocks that operate within an industry and their effect upon competitive behaviours, including rivalry, is a legitimate goal for researchers and practitioners alike.

Strategic Groups and Rivalry

Developed from the implicit understanding that competition within an industry is not homogeneous, the concept of strategic groups was initially identified by Hunt in 1972. Since this time, an economic perspective has largely dominated research and discourse, with the focus of empirical studies predominantly geared towards an analytical approach to strategic group determination, performance variations between firms, group and competitive dynamics (Cool & Schendel, 1988; Fiegenbaum & Thomas, 1993; Mascarenhas, 1989). As this study is concerned primarily with rivalry, the scope of this paper allows for a review of only the most prominent and relatively few works in this particular area, as opposed to a more generalist coverage of the development of the strategic group concept. For broader, critical reviews of the strategic group concept, see McGee (1985), McGee and Thomas (1986) or Thomas and Venkatramen (1988).

Considerable interest in the strategic groups concept has emanated from the theoretical link between group membership and profitability (Caves & Porter, 1977; Porter, 1979). Central to this link is the premise that firms cannot easily switch between strategic groups due to mobility barriers, making members of certain groups persistently more profitable than those of other groups (Porter, 1979). Implicit in the concept of mobility barriers is the notion that rivalry differs within and between groups, with Caves and Porter (1977) hypothesising that rivalrous behaviour between firms within different strategic groups is greater than the rivalry witnessed between firms within the same group. Similarities in competitive posture and strategy are expected within each strategic group, with distinct differences in firm-specific attributes and strategy evidenced between groups. Therefore, 'structural similarities among firms predisposes them to respond in similar ways to disturbances from inside or outside the group' (Peteraf, 1993: 520). It is these similarities amongst firms that encourage tacit coordination mechanisms to develop. Cool & Dierickx (1993) support this view, suggesting that similar competitive behaviours of firms within a strategic group emanate from firms' recognition of their mutual dependence within an industry.

Whilst the expectation of rivalry being higher between groups, as opposed to within groups has been the normal jumping off point for studies looking at the link between rivalry and strategic group membership, the reverse argument has also been made (Smith et al, 1997). In essence, differences in terms of resources and interpretation of the competitive

environment can make it difficult to predict and coordinate actions with rivals across a strategic group (Porter, 1980). Furthermore, coordination can break down under a number of conditions, most notably when there are a large number of competitors within a single group (Scherer & Ross, 1990). Porter (1979) also suggests that the greater the market interdependence (the degree to which firms within a group target the same set of customers) the greater the rivalry.

To study these alternatives regarding the link between strategic group membership and rivalry, there have been a limited number of empirical studies. In the first of these, Peteraf (1993) segmented the US domestic airline industry into those that existed prior to the deregulation of the industry and those that constituted new entrants. The Caves-Porter hypothesis was partially supported with prices being 9 percent above a standardised level when there were only carriers from a single strategic group operating on a route, versus 7.5 percent below this level for routes with competitors from different strategic groups.

The other significant strategic group oriented study of the airline industry saw Smith et al (1997) assess rivalry from a multi-dimensional perspective whereby rivalry was determined by a range of variables including competitive activity, degree of rivalry instigation, proclivity toward price cutting, speed of response and tit-for-tat imitation. Strategic groups were determined through a multi-variable cluster analysis technique. Smith et al (1997) found that while competitive actions of firms may be predicted on the basis of strategic group membership, there was no evidence of differences in rivalry between groups versus within groups.

In examination of strategic groups and rivalry outside of the airline industry, Cool and Dierickx (1993) sought to determine the nature of within and between group rivalry, and looked at how strategic group dynamics may affect firm profitability. In analysis of the US pharmaceutical industry (1963-1982), the authors determined strategic groups using a mix of variables including profitability, concentration, segment interdependence and strategic distance. The findings of this longitudinal study observed rivalry shifting from within group rivalry to between group rivalry.

It is reasonable to surmise that the results to date of investigations into the strategic group – rivalry relationship are relatively inconclusive, though they do offer the foundation upon which further empirical investigation is warranted. Certainly those questioning the existence of strategic groups would seem to be in the minority as the value of strategic groups in understanding industry effects has been demonstrated numerous times (e.g. Dranove,

Peteraf & Shanley, 1998; Gonzalez-Fidalgo & Ventura-Victoria, 2002). However, all future studies must be mindful of both the way strategic groups are determined and the measures used to determine rivalry as the lack of consistent approaches in these areas have been highly problematic for the field. A number of studies have sought to address the continual criticism made of strategic group research, how does one define strategic groups (e.g. Nath & Gruca, 1997) but there is still little consensus in the area. Thus, with strategic groups unable to adequately explain intraindustry patterns of rivalry, it may be necessary to review other intraindustry clustering tools such as strategic blocks.

Strategic Blocks and Rivalry

In contrast to the substantial research heritage of the strategic group concept, the strategic block rationale is still in its infancy. Strategic blocks are recognised as sets of firms in an industry that exhibit denser strategic linkages among themselves than other firms within the same industry (Garcia-Pont, 1992). Such strategic linkages may adopt multiple forms, including joint venture agreements, strategic alliances, mergers, acquisitions, technology licensing and development arrangements, equity partnerships, and manufacturing, marketing and distribution collaborations (Nohria & Garcia-Pont, 1991). The concept of strategic blocks was first anticipated by Harrigan who termed these formations of strategic linkages as 'constellations' (Harrigan, 1985). Prior theoretical and empirical research into the realm of interorganisational strategic linkages (regardless of form), had, until this time, focused almost exclusively on the pre-conditions, formation, management, performance implications and economic impact that these strategic linkages had on the industry environment.

The conceptual and empirical value of network theory in discerning the competitive dynamics of industrial environments is considered a relatively new addition to strategic management research (Thomas & Pollock, 1999). Prior theoretical and empirical enterprise in network theory has largely focussed upon the micro perspective of application in respect to organisations and strategy (Madhavan, Koka & Prescott, 1998). Derived in large from the social sciences, network theory additionally allows for the macro examination of the opportunities and constraints inherent in a structure of interorganisational relationships, establishing a relational approach upon which the conduct and performance of firms can be more fully understood (Gulati, Nohria, & Zaheer, 2000; Madhavan, 1996).

Thus far, there have been only two significant empirical studies into the existence and operation of strategic blocks. The first of these by Garcia-Pont as part of his doctoral research (see Garcia-Pont, 1992; Garcia-Pont & Nohria, 2002; Nohria & Garcia-Pont, 1991) was largely directed toward determining the *structure* of networks of strategic linkages in

selected industries. This empirical study of strategic blocks in the worldwide automotive and European banking industries argues that strategic linkages are formed in response to market imperfections for particular resources (Garcia-Pont, 1992). Garcia-Pont (1992) postulates that strategic blocks are an outcome of an individual organisation's need for access to strategic resources required for industry survival, but not held by the single firm. Rather, the collective strategic block represents an accumulation of those scarce and highly valued resources and capabilities which are accessible at both an individual and group level and which serve to tie individual firms in an industry into a much larger system of exchange (Garcia-Pont, 1992). Strategic blocks can therefore be understood in terms of the resource endowments and strategic capabilities of firms, and the nature of competitive interaction within the context of the industry environment. Garcia-Pont's research did not directly address the issue of rivalry, however, by implication, those firms that are tied to each other through an alliance structure within a larger system will tend to coordinate their behaviours to a greater extent than those outside of the system. No empirical data was collected to test this proposition.

The second study by Vanhaverbeke and Noorderhaven (2001) examined the development and manufacture of RISC microprocessors in relation to technical standard wars between participant organisations. Defining blocks according to horizontally aligned alliance relationships, Vanhaverbeke and Noorderhaven suggest that such competitive arrangements represent a new form of rivalry, where firm-to-firm competition is superseded by group-to-group rivalry. The authors propose that 'analysis on the level of the individual players or dyads will fail to produce an understanding of the nature of competition shaping the industry', instead proposing that competitive advantage must be understood as 'not only the result of company-based characteristics but also features of the *alliance block* to which the firm belongs' (Vanhaverbeke & Noorderhaven, 2001: 1-2, italics added). Concerned with governance mechanisms, boundaries, composition and internal structure of alliance blocks, the authors determine 'blocks' based on the density of strategic alliance relationships between firms in the period 1980-1989. The findings generated from this research, which did not directly measure rivalry, indicate the presence of competitive configurations of organisations structured around technical standards (Vanhaverbeke & Noorderhaven, 2001). Again, whilst there is no empirical data to support any rivalry and strategic blocks relationship, the implication within the paper is that firms that are extensively linked (in this case because of technical standards within products) coordinate their behaviour, leading to lower levels of rivalry between firms within the same alliance block.

Thus, unlike the fundamental difficulties associated with strategic group research in terms of group determination, strategic block research potentially provides a simplistic approach to understanding patterns of rivalry within industries. This research is therefore concerned with the comparative assessment of the strategic group and strategic block concept in deciphering patterns of intraindustry rivalry. To this effect, we set out to answer the following research question:

Are strategic groups or strategic blocks a better predictor of rivalry in the international airline industry?

In essence, the strategic group literature would suggest that the level of rivalry will increase as the number of strategic groups increase (independently of the number of competitors). Within a single strategic group, implicit coordination mechanisms are likely to develop as the resource endowments of firms are relatively similar across the critical strategic dimensions. As additional groups enter a market, rivalry will increase as there are no coordination mechanisms in existence with firms from other groups, and in the case of the airline industry, we predicted that the differing resource bases of firms from strategic groups would lead to increased competition, whereby this competition reverts to the lowest common denominator – price. Thus, the increase of rivalry can be explained on the basis of differing resource endowments across firms.

In comparison, the implication of the two studies completed in the area of strategic blocks is that rivalry within a single strategic block will be low due to the interrelationships that exist on the basis of the various strategic alliances. The mutual interdependence of firms in a strategic block limits opportunistic behaviour and encourages tacit coordination. However, when there is more than one strategic block within a market, rivalry at a network level is likely to occur where one block (network) seeks to compete in a relatively unified manner against the other blocks. In the case of RISC microprocessors Vanhaverbeke and Noorderhaven (2001) found that the competition occurred at the block level in relation to technical standards. In the airline industry we predicted that blocks such as the Oneworld or Star alliances would compete in a relatively unified manner as they sought to attract customers into their alliance block. Therefore, whilst increased rivalry at the strategic group level can be explained in relation to differing resource endowments, in the case of strategic blocks the increase in rivalry can potentially be explained in terms of alliances creating a level of mutual interdependence amongst firms within a strategic block.

METHODS

The airline industry was chosen for this study on the basis of several considerations. As Peteraf (1993) and Smith et al (1997) attest, participants can be easily identified, with subsequent groupings robust to re-examination. For the creation of strategic blocks there are well established and easily identified alliance groupings. In addition, the competitive environment is well recognised (Smith et al, 1997) and there is ready access to accurate and timely data through published fares.

Subjects and procedure

Data from 11 competitive airline routes (ex-Australia) collected over a six month period in 1998 were included in the study. Every five days information was collected on the price of all airfares on each route, number of carriers, number of strategic groups, and number of strategic blocks operating on the route.

Measures

Rivalry. Rivalry between strategic groups can manifest itself in a number of ways. Smith et al (1997) recognised this and used multiple measures of rivalry that moved beyond the price focus of Peteraf (1993). However, to cover the full gambit of rivalry manifestations contemporary studies would need to consider additional variables such as the offering of double frequent flyer points on certain routes, combining hotel and other specials with airfares, varying ticket conditions at the same price point, and the lobbying of governments by firms to negotiate access rights to foreign ports. Rather than try to study the multi-dimensional construct of rivalry, this study restricts itself to considering how price behaviour varies according to the number of strategic groups/blocks operating on a set route. Specifically, we set out to measure the level of price discounting as the most overt form of rivalry in the industry. Price discounting was calculated by dividing the lowest available fare for the route by the highest available economy fare. The result is a ratio that indicates the percentage of fare discounting in operation for the route. Based on this figure, the lower the percentage, the heavier the discounting. Discussions with airline staff have suggested that the full economy fare (as the highest economy fare) is approximately a multiple of the true cost of offering a seat on a particular route (accounting for distance, aircraft type, staffing costs etc). The lowest fare therefore represents the extent to which airlines discount below the true cost (including both fixed and variable costs) of a seat on a route, and this ensures that the level of price discounting can effectively be compared across routes as a measure of (price oriented) rivalry.

There are a number of potential problems with using the level of fare discounting as a measure of rivalry. Firstly, while the product of an economy airline seat may seem to be relatively homogenous (suggesting that the market is relatively homogeneous), the product is actually made up of a number of hedonic characteristics. The full economy fare includes the attribute of complete flexibility regarding changing the ticket or receiving a refund, whereas the lowest discount economy fare contains numerous conditions and therefore suits a different market segment. The result may be that a large difference between high and low fares may simply reflect the fact that airlines on a route have carefully differentiated between these different markets and have structured their prices accordingly. However, as a full economy fare is a rough proxy for the true cost of a seat on a route, the question becomes why do airlines have to vigorously discount on some routes relative to others to gain custom? We suggest that this level of discounting is at least partially a function of the competitive dynamics featured on a route which in turn is likely to be affected by the absolute number of competitors, the number of strategic groups and the number of strategic blocks.

The second criticism of using the lowest fare over the highest fare ratio is that it allows us to only measure rivalry across one segment of the market. As the lowest fare contains numerous conditions including the fact that it cannot be changed without substantial penalty once issued, it is only suitable for certain travellers that can commit to particular dates at least one month in advance. Such customers tend to be holiday makers and business travellers undertaking specific tasks such as attending conferences and completing training courses where the dates are set well in advance. Thus it is possible that airlines may compete vigorously in this market in terms of offering some fares that are set at a very low proportion of the true cost of a seat on that route (i.e. they cover little more than the marginal cost of one additional customer). In comparison, there may be far less rivalry in a different market segment (such as the equivalent of a seven day advance fare with less onerous conditions) on one route relative to others. Thus, when we discuss rivalry in this study we are really referring to the price based rivalry that occurs in just the most price conscious market segment.

Number of Strategic Groups. For the purposes of this study, Porter's classification of strategic groups as 'a group of firms in an industry following the same or similar strategy along the strategic dimensions' (1980: 129) was employed. To operationalise this definition, airlines were studied according to two dimensions – extent of route structure and ownership (private or majority government). The aim was to capture the differences in the general size of airlines to differentiate between the mega-carriers (such as British Airways and United) and the mid-sized airlines (such as Malaysian Airlines and Qantas). For the other dimension,

ownership was seen as being important as some airlines are run by governments at a loss simply to ensure that the more important tourist income is maximised. In comparison, privately owned carriers are more likely to feel the full weight of economic realities and act accordingly (i.e. withdraw from a route or simply not engage in tit-for-tat price rivalry). Thus ownership has a significant effect upon competitive behaviour of an airline, thereby affecting the level of rivalry. We plotted each airline in the sample and found there to be three clear clusters (privately owned mega-carriers, privately owned mid-sized carriers and government owned smaller carriers).

Whilst the trend for determining strategic groups has been through the use of cluster analysis and other multi-dimensional approaches (e.g. Fiegenbaum, Thomas & Tang, 2001; Houthoofd & Heene, 1997; Smith et al, 1997) we believe that such complex approaches suffer on two counts. First, the inclusion of numerous (and possibly contradictory) variables has the potential to confound any relationships that may exist. In our eyes, the classic example of this was the fact that the relatively simple approach used by Peteraf (1993) to classifying groups (pre and post deregulation in the US) and rivalry (price based rivalry) produced significant results. In comparison, the much more complex study (both in terms of rivalry and group formation) by Smith et al (1997) in the same industry failed to support or refute the Caves-Porter (1977) hypothesis. Further simple studies, such as that by Nair and Kotha (2001) where strategic groups in the Japanese steel industry were simply determined on the basis of two types of production technology also produced significant results. The second problem with complex multidimensional approaches to group formation is that if managers are to gain any benefit from the strategic group notion, then the concept must be able to be applied in a relatively 'rough and ready' way. We can explain performance or behavioural differences retrospectively using these complex grouping techniques, however if managers are to ever use strategic groups in a predictive way as part of their strategy formulation process, then relatively simple strategic group determination techniques will be required.

Number of Strategic Blocks. Strategic blocks were determined according to whether airlines were a central part (or somehow affiliated with) either the Oneworld group of airlines or the Star Alliance (no airlines in the sample were part of the Sky Team). Those carriers that were not part of either of these two alliances were considered to be part of a third group – the non-aligned carriers.

Number of Carriers. For each route, the number of carriers flying at each particular point in time was counted. The number of carriers was seen as being a potentially significantly

mediating variable. It was expected that as the number of carriers on a route increased, so too would the level of rivalry and thus this variable needed to be controlled for in our study.

RESULTS

Descriptive statistics and intercorrelations among study variables are shown in Table 1. The results indicated that all study variables were significantly intercorrelated with each other. Number of Carriers displayed a consistently high interrelationship with all of the other variables. This finding supports the argument that Number of Carriers may act as a potential confound to the study of Rivalry (level of price discounting). It should be noted that the standard deviations for all study variables were noted to be relatively small.

TABLE 1
Correlations between study variables

Variable	Mean (Std)	1.	2.	3.
1. Rivalry (fare discounting)	0.53 (.11)			
2. No. Strategic Groups	2.00 (.63)	-.79**		
3. No. Strategic Blocks	3.02 (1.34)	-.46**	.63**	
4. No. Carriers	2.20 (.75)	-.70**	.81**	.72**

Note - * $p < 0.05$, ** $p < 0.01$.

The research question set out to examine the relationships between the independent variables – the number of strategic groups and the number of strategic blocks - and the level of rivalry. In order to test the relationship, two hierarchical multiple regressions were conducted, each with the independent variables entered in a different order. The regression analyses were conducted with variables being entered over 3 steps. The Number of Carriers variable was entered at step 1 in order to control for differences in numbers of airlines associated with each route. Step 2 involved entering number of Strategic Groups for the first regression and number of Strategic Blocks for the second regression. Step 3 involved the entry of the independent variable not entered at Step 2.

Checking the data against the assumptions of hierarchical regression revealed non-normal distributions. The data was transformed to resolve the issue. Comparison between transformed and non-transformed solutions revealed no major differences so the non-transformed results are presented here. All other statistical assumptions were passed.

Overall, the number of Strategic Groups and Strategic Blocks significantly predicted degree of (price based) Rivalry [$F(3,356) = 216.74, p < 0.001$] (See Table 2 or Table 3). The results showed that all study variables accounted for approximately 65% of variance in the Rivalry variable. Of this variance approximately 50% was explained using the control variable (Number of Carriers) leaving the remaining variance to be explained by the independent variables. As hypothesised, the level of prediction for the independent variables was not equal with number of Strategic Blocks accounting for approximately 2% (see Step 3 in Table 2) [$F(1,356) = 14.69, p < 0.001$] and number of Strategic Groups accounting for approximately 15% (see Step 3 in Table 3) [$F(1,356) = 145.97, p < 0.001$]. Given the small degree of variance noted in the study variables and the smaller percentage identified after the control variable was entered it can be assumed that, although significant, the independent variables were associated with relatively small changes in the level of Rivalry. The predictive ability of the independent variables were found to differ as hypothesized with number of Strategic Groups being a better predictor (Beta = -.66) of Rivalry than number of Strategic Blocks (Beta = .18).

TABLE 2
Hierarchical Multiple Regression investigating the unique contribution of Strategic Blocks (Step 3)

Variables	Step 1	Step 2	Step 3
Number of Carriers	-0.70**	-0.19**	-0.30**
Number of Strategic Groups		-0.63**	-0.66**
Number of Strategic Blocks			0.18**
R Square	.495	.631	.646
Adjusted R Square	.494	.629	.643
Change in R Square	.495	.136	.015
Change in F	352.07**	131.80**	14.69**
F	352.07**	306.07**	216.74**

Note - * $p < 0.05$, ** $p < 0.01$, Dependent Variable = Rivalry (fare discounting)

TABLE 3
Hierarchical Multiple Regression investigating the unique contribution of Strategic Groups (Step 3)

Variables	Step 1	Step 2	Step 3
Number of Carriers	-0.70**	-0.78**	-0.30**
Number of Strategic Blocks		0.10*	0.18**
Number of Strategic Groups			-0.66**
R Square	.495	.501	.646
Adjusted R Square	.494	.498	.643
Change in R Square	.495	.006	.145
Change in F	352.07**	3.95*	145.97**
F	352.07**	179.46**	216.74**

Note - * $p < 0.05$, ** $p < 0.01$, Dependent Variable = Rivalry (fare discounting)

Investigating the mean level of fare discounting by number of Strategic Groups and number of Strategic Blocks demonstrates a linear relationship for Strategic Groups and a non-linear relationship for Strategic Blocks. These results may explain the low beta for Strategic Groups in the regression analyses. A Multivariate ANOVA was also run to evaluate the relationship between the independent variables (Strategic Blocks and Strategic Groups) and the dependent variable (Rivalry). Given that there were three levels of each independent variable MANOVA was most suitable for a non-normal distributions. Results indicated a significant interaction, $F(1,356) = 6.56$, $p < .05$, $\eta^2 = 0.02$, $r^2 = 0.77$. Comparing the interaction with the main effects for Strategic Groups, $F(2, 355) = 242.35$, $p < .001$, $\eta^2 = 0.58$, and Strategic Blocks, $F(2,355) = 67.46$, $p < .001$, $\eta^2 = 0.28$, suggested greater differences for levels of Strategic Groups in level of the rivalry. Post hoc analyses indicated that all levels of Strategic Groups and Strategic Blocks variable were significantly different from each other.

In summary, these results suggest that each increment of Strategic Blocks and Strategic Groups results in a significant change in Rivalry. Although each increment in Strategic Groups has resulted in increases in Rivalry a similar trend was not found for Strategic Blocks where the two block condition was associated with the least level of rivalry. In relation to the level of rivalry that could be explained by the Strategic Groups and the Strategic Blocks

concept, it was found that Strategic Groups was able to explain a far greater proportion of the Rivalry variable than was the case with Strategic Blocks.

DISCUSSION AND CONCLUSIONS

The results supported the argument that the level of price based rivalry was predicted by both strategic groups and strategic blocks, with the former accounting for proportionally more of the variance. These results were identified after the effect for the number of carriers was controlled. Considering the moderately limited period of data collection, the results would suggest that the data is relatively robust. However, the potential for other factors to confound the results is significant. Whereas Porter (1979) suggests that rivalry will increase as the number of competitors increases (which was controlled for) the level of rivalry may also be affected by the capacity of the route and the passenger mix (i.e. business versus leisure travellers). We were unable to control for these variables due to our inability to obtain this data and thus our findings are limited by this fact. However, the span of the data did control for seasonal effects as the data collection process was started in what was the low season for most routes ex-Australia, moved through the shoulder season into high and then back into shoulder. While the level of discounting varied across these seasons, the general trend of those routes with higher numbers of strategic groups witnessing greater levels of price discounting remained.

As anticipated, the results showed both strategic groups and strategic blocks to affect the level of price discounting present on a route. Rivalry is therefore affected by more than simply the number of carriers on a route. The finding that strategic groups was a better predictor of rivalry was perhaps a little unexpected. Our expectation was that the various cooperative measures that come with being part of an alliance block would limit competition within a block. Airlines within a strategic block engage in code-sharing, they allow for redemption of frequent flyer points on each others' flights, they share executive lounges and they inter-line their services. Thus it was thought that if a single strategic block operated on a route then the benefits of vigorous competition would be minimal and therefore the level of price discounting required to gain custom would be relatively limited. Furthermore, the strength of the two major alliance blocks is similar and thus the potential for one block to outperform the other alliance block was limited. Financially, neither block is about to be knocked out of the industry and thus we expected fairly strong tacit cooperation where only one block operated, limited tacit cooperation where the two alliance blocks operated and strong competition when all three strategic blocks were found on the route.

The explanation for strategic blocks having relatively limited effect upon the level of rivalry may exist in the strength of the alliances. Both the Oneworld and the Star Alliance are relatively fluid in terms of their membership. With the exception of around four key players each, the alliances have continually accepted new members at around the same rate that other airlines have withdrawn from the alliances. Thus while Vanhaverbeke and Noorderhaven (2001) found that firms within alliance blocks closely related to others within the block on the basis of a common technological standard, it would seem that airlines in the major blocks engage in alliances out of necessity (to offer more services and route options at lower cost) at a very minimal level and never truly identify with the alliance as a coherent group. It was observed that the alliances were used more as a last resort where one airline did not fly into a particular location, but wherever possible, airlines made decisions that would benefit themselves and generally did not account for the effect that their decision may have upon another alliance member. For example, Qantas and Cathay Pacific are both members of the Oneworld alliance. They both cover a number of routes between Australia and Hong Kong, however, almost none of their flights between these two locations include code-share arrangements. Passengers flying with Cathay Pacific from Hong Kong that need to fly to other parts of Australia from their initial landing point will use Qantas in much the same way that passengers from Australia flying into other parts of China will use Cathay Pacific. However, the level of cooperation seems to be minimal, except where one airline can use the other to offer further services. The exception to this minimal level of engagement seemed to occur where one airline had a significant equity stake in another. Thus Qantas and British Airways truly do interline their services and undertake numerous code-share flights. Similarly, Ansett's route expansion never included routes that were already covered by Air New Zealand (who held a 49 percent stake in the Australian carrier).

At a theoretical level, the results would suggest that if strategic blocks are going to have an effect upon the strategic decisions that a firm makes, and in the process affect the level of rivalry, then the alliances must be more than just a loosely affiliated group that do little more than coordinate their activities at the barest possible level. The theoretical underpinnings associated with strategic blocks continue to make logical sense, however, for firms to act in ways that account for their alliance partners, then the alliance must have the potential to affect the performance of the firms in a meaningful way. In the case of airlines this was seen in the way that the behaviours of those airlines that were linked through equity stakes tended to be far more cooperative than those airlines that were simply part of the alliance blocks. Where this was the case, the performance benefits of being part of the alliance were obviously relatively limited (especially for the smaller airlines) and it is for this reason that so

many of them have withdrawn from the alliance blocks over the years. Therefore, the weak ties associated with the strategic blocks in this case probably go a long way to explaining the relatively weak effect that strategic blocks had upon the level of rivalry.

Instead, it would seem that strategic groups can better help understand the patterns of rivalry in this case. The RBV perspective, as the dominant underlying theory for determining strategic groups, sees strategic group formation occurring on the basis of resource endowments and competitive scope (Cool & Schendel, 1987). The RBV suggests that firm strategies will build on (and thus be a reflection) of a firm's resource endowments and this certainly can be seen in the airline industry. The very large carriers that are privately owned try hard to limit the amount of price based competition where possible. They seek the business traveller, offer frequent flyer programs and in general, try to offer superior value to the extent that they are not drawn into price wars. In comparison, airlines with few resources, and thus unable to provide this level of superior service, have few opportunities to compete along any dimension other than price. This is particularly pronounced in the case of airlines that are government owned, as these airlines are generally relatively resource poor and they often have goals that do not include profit maximisation. Consequently, the more strategic groups on a particular route, the more diverse the firms are that compete on that route and thus (due to the high fixed cost nature of the airline industry) the more propensity there is for all airlines to get drawn into heavy price discounting. In essence, our results support the previous theoretical work done by Caves and Porter (1977) in terms of tacit coordination mechanisms developing between firms with similar competitive positioning, and also the work of Cool and Dierickx (1993) who suggest that mutual dependence tends to lead to predictability in terms of rivalrous behaviour among firms within an industry.

However, despite the significance of these results, future research should aim to clarify a range of questions that arise out of these findings. Is a similar effect likely in other industries (or other parts of the airline industry)? Another difficulty in this arena of research is ensuring that the measures of strategic groups and strategic blocks are clearly defined and are clearly independent concepts. We would certainly recommend that the creation of strategic blocks is done on the basis of alliances and other cooperative behaviours that signal true interdependence of alliance members. In relation to strategic groups, the greatest criticism lies in relation to the way that groups are formed. Alternative conceptualisations of strategic groups may need to be considered. Further study into other confounding factors may prove an insightful exercise in addressing the variations in methodology currently seen in the literature. In addition, the current study happened to focus on a period of relative stability in the chosen travel routes, yet future studies may also benefit from the inclusion of larger

variations in numbers of strategic groups and strategic blocks. Such a study may ultimately test the range of association between such entities and the level of competitive pricing. In order to clearly avoid the possibility of interconnecting our measures of strategic groups and strategic blocks we used clear and simple definitions of both terms. Although this may address issues of variable independence (mentioned earlier) it has the effect of reducing some of the generalisability of the findings. On the other hand, we were able to distinguish an important effect that is worthy of further study.

Overall, this study adds to the body of literature regarding intraindustry patterns of competition in two important ways. Firstly, it studies the role of strategic blocks in relation to rivalry. The lack of work done in relation to strategic blocks including the fact that no empirical research has been done in relation to rivalry makes this an important contribution. This contribution is still important even though the strategic blocks were determined on the basis of relatively weak ties, a factor that may have affected our findings. Secondly, the predictive ability of strategic blocks was tested relative to strategic groups in relation to the rivalry construct. Consistent with the expected results and other studies, strategic groups were found to be important (e.g. Dranove, Peteraf & Shanley, 1998), with strategic groups explaining considerably more variance in the level of price based rivalry relative to the concept of strategic blocks.

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