COMPETITIVE TENSION:
THE AWARENESS-MOTIVATION-CAPABILITY PERSPECTIVE

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Abstract

This paper investigates competitive tension, or the strain between a focal firm and a given rival that precipitates the firm to take action against the rival. We argue that perceived tension is socially constructed and has a significant impact on competitive action. Drawing on the awareness-motivation-capability perspective, we show how relative scale, rival’s attack volume, and resource similarity influence perceived tension. Our findings contribute to competitor analysis and bridge cognitive competitive mapping and competitive dynamics research.
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In science, there is a steady state in which opposing forces hold each other in check until the build-up of
tension turns the static relationship into dynamic interplay—the point at which the steel cable snaps, the
steam chamber’s pressure valve opens, or one psychological force overwhelms the other. In business
practice, a similar phenomenon exists: tension that one opponent imposes on the other triggers rivalrous
actions.

Competitor analysis is central to strategy and organization research (Porter, 1980; Hitt,
Ireland, & Hoskisson, 2005). The literature has explored a number of important issues, including
conjecture variation (Amit, Domowitz, & Freshtman, 1988), competitor conceptualization (Porac
& Thomas, 1990), and blind spots (Zajac & Bazerman, 1991), and has made advances in areas
such as the theoretical integration of competitor analysis and interfirm rivalry (Chen, 1996).
Some fundamental questions—such as who a focal firm’s competitors are, and how much
competition the firm faces with each competitor—have been implicitly or explicitly addressed by
two parallel research streams: competitive dynamics (e.g., Smith, Ferrier, & Ndofor, 2001) and
cognitive competitive mapping (e.g., Reger & Huff, 1993; Porac, Thomas, Wilson, Paton, &
Kanfer, 1995). However, the concept of competitive tension and related ideas, such as intensity
(Barnett, 1997), threat (Michell, 1989), and pressure (Sinha & Noble, 1997), have been used
interchangeably in the literature without systematic conceptualizations or operationalizations.

Competitive dynamics, which takes individual competitive action as the focal point of
analysis, has examined predictors and effects of interfirm rivalry (Chen & MacMillan, 1992;
Ferrier, 2001). This research has produced a diverse set of organizational and strategic variables
centered on awareness, motivation, and capability—three key drivers of interfirm rivalry.
However, researchers have relied almost exclusively on observable market factors or structural
variables, ignoring the perceptual aspect of interfirm rivalry. Cognitive competitive mapping
research (Labianca, Fairbank, Thomas, Gioia, & Umphress, 2001; Hogkinson & Sparrow, 2002)
has filled this hole, providing a perceptual construction of competitor (Porac & Thomas, 1990) and of strategic (Reger & Huff, 1993) and competitive groups (Porac, et al., 1995). Nonetheless, it tends to treat a firm’s competitors as a homogeneous group, and has made almost no effort to examine the varying degrees of “pressure” (Porter, 1980) that a firm experiences from its rivals, let alone the implications for interfirm rivalry, including attack (Ferrier, 2001) and retaliation (Chen & MacMillan, 1992). To address this fundamental concern, this paper proposes a construct that neither of these research streams has yet conceptualized: competitive tension.

Competitive tension is defined here as the strain between a focal firm and a given rival that precipitates the firm to take action against the rival. Although our conceptualization incorporates both objective and perceptual considerations, the empirical focus of this research is on perceived competitive tension. Specifically, we first investigate the extent to which firm-dyad variables (such as relative scale, rival’s attack volume, and resource similarity) derived from the awareness-motivation-capability (AMC) perspective (Chen, 1996) can predict perceived tension. To demonstrate the significance of the proposed construct and its behavioral implications, we then examine the effects of perceived tension on the firm’s consequent competitive actions against this rival.

In so doing, the paper formalizes the AMC perspective for competitor analysis and reinforces its link with interfirm rivalry (Chen, 1996). Through the perceptual consideration of competitive tension and objective treatment of the AMC sources of perceived tension, this research bridges competitive dynamics and cognitive competitive mapping research, an effort initiated by Reger and Huff (1993), and Jayachandran, Gimeno, and Varadarajan (1999).

COMPETITOR ANALYSIS AND INTERFIRM RIVALRY

Every firm has its own conceptualization of competitor (Porac & Thomas, 1990). The
strategy literature has paid significant attention to firm-level competitor analysis, in contrast to the brand-/product-level analysis in marketing (Clark & Montgomery, 1999) or the industry-level analysis of industrial organization economics (Porter, 1980). Although competitive dynamics research and cognitive competitive mapping share a common interest in competitor analysis, each has a different theoretical foundation, and each offers unique contributions.

**Competitive Dynamics**

Research in competitive dynamics, which conceptualizes interfirm rivalry as the exchange of actions and responses, has found that the characteristics of an action (Ferrier, 2001), of the attacker (Chen & MacMillan, 1992) and of the defender (Smith, et al., 1991) are related to the likelihood and speed of a response, and that interfirm rivalry is important to performance (Young, Smith, & Grimm, 1996). It has also made some important conceptual advances. To capture the relational nature of competition, competitor analysis has been carried out in pairs, taking the perspective of a focal firm (Chen, 1996). This dyadic approach acknowledges varying degrees of competition inherent in each relationship and constitutes a fine-grained analysis that complements the conventional structural (Porter, 1980) or group approach (Cool & Schendel, 1987). As Baum and Korn (1999: 251-252) have emphasized, the phenomenon that firms compete with each other is “not an aggregate property of industries, markets or firms; it is a property of the [market] relationship between two firms.”

Research has also shown that the analysis of competitors is especially meaningful if it can be used to predict interfirm rivalry, or the engagement between firms through competitive actions (Chen, 1996). This understanding is essential for establishing a conceptual linkage between competitor analysis (a static consideration of the relationship between firms) and interfirm rivalry (interplay between firms and the behavioral aspects of competition). To this
end, scholars have identified three underlying drivers of rival behavior: awareness of the competitive relationship and/or competitors’ initiatives, motivation to act (or respond), and the capability to do so (Smith et al., 2001). Recent efforts have studied a stream of actions (Ferrier, 2001) and interfirm rivalry in a multimarket context (Baum & Korn 1996; Gimeno 1999). For instance, research found that a simultaneous, sequential attack of many actions carried out over a significant duration of time may overwhelm rivals into a period of inaction (Ferrier, 2001).

Despite progress, competitive dynamics research has mainly examined competition based on observable market variables or structural indicators, leaving unexplored some critical issues concerning the cognitive construction of competition based on perceptions and opinions of corporate executives and industry stakeholders. Two firms facing exactly the same market conditions may evaluate competitors and interfirm relationships differently (Chen, 1996), yet this stream of research implicitly assumes that all firms within an industry view their “market interdependence” equally (Porter, 1980) or classifies competitors broadly as direct or indirect (Peteraf & Bergen, 2003). A few scholars have begun to stress the need to evaluate this assumption and complement the use of objective indicators with a perceptual evaluation of a firm’s competitive environment (Jayachandran, et al., 1999; Ferrier; 2001).

**Cognitive Competitive Mapping**

This research stream holds that managers take actions in accordance with the cognitive map they construct (Please see Hodgkinson & Sparrow, 2002 for a comprehensive review of this research stream and detailed discussion of the relationship between cognitive measures and identification of competitors). As noted by Porac, Thomas, & Baden-Fuller (1989: 398), cognitive mapping “portray[s] human activity as an ongoing input-output cycle in which subjective interpretations of externally situated information become themselves objectified via
behavior.” As a result, “[managerial] cognition and motivations systematically affect the processing of issues and the types of organizational actions taken in response to them” (Dutton & Jackson, 1987: 76). Indeed, scholars taking the cognitive mapping approach have contributed to the conceptualization (Porac, et al., 1995), identification (Clark & Montgomery, 1999), and categorization (Hodgkinson & Johnson, 1994) of competitors and strategic groups (Reger & Huff, 1993). Collectively, these studies have found that cognitive (or perceptual) factors contribute to industry stratification (see review by Labianca, et al., 2001).

Although this line of research has made significant contributions to competitor analysis, it is also characterized by certain constraints. It has focused mostly on managerial perception without taking into account the opinion of a firm’s other stakeholders (such as analysts and consultants) who may influence the firm’s competitive considerations (Chen, Farh, & MacMillan, 1993) and strategic actions (Zuckerman, 1999, 2000). It also considers firms within the same “primary competitive group” (Porac et al., 1989: 414) as homogeneous or classifies them broadly as core or peripheral firms (Porac, et al., 1995). Drawing on the idea of managerial categorization, cognitive competitive mapping research assumes that similar firms, or firms that belong to the same strategic group, will face the same degree of competition and hence compete equally with one another. It ignores the intricacy of differential relationships and possible asymmetry of competitive perceptions and behaviors for each pair of firms (Chen, 1996).

**COMPETITIVE TENSION**

The above review has shown that competitive dynamics and cognitive competitive mapping research look at competition and competitors from different angles, and that each provides insights that complement the other (Porac et al., 1995; Reger & Palmer, 1996). Neither of the two research streams, however, has made a systematic effort to conceptualize and examine
the varying degree of tension a firm experiences from other industry players.

Consistent with competitive dynamics research, competitive tension is a firm-dyad concept; and in line with cognitive competitive mapping research, it incorporates perceptual views of competition. The firm-dyad conceptualization offers a middle ground between firm and group, and this is the level where interfirm rivalry can be meaningfully examined (Chen & MacMillan, 1992). An unexamined construct in competitor analysis, competitive tension provides a conceptual link not only between these two research streams, but also between the static analysis of competitors and the dynamic treatment of interfirm rivalry (Chen, 1996).

For several reasons, we use “tension” as opposed to threat, intensity, or other terms.¹ Most importantly, tension, as it is conceptualized here, describes the state of latent strain that precipitates the “breaking point” when strain becomes manifest through competitive actions. As such, tension defines the forces that pull a static interfirm relationship into dynamic behavioral interplay between rivals. It is like an energy storage agent: once there is enough “build-up” (due to managerial and industry psychology or history of prior battles), competitive tension will “explode” into competitive actions and rivalry.

Tension lends itself to both objective and perceptual considerations. As a term used widely in the natural and social sciences, tension has objective definitional meanings, as in physics, fluid mechanics, and electronics, as well as subjective or perceptual applications, as in psychology and psychiatry (Lewin, 1951). Physics, for example, uses tension to describe

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¹ A few words to clarify the subtle differences among these related terms. Threat is a specific and substantial challenge one firm presents to another; intensity denotes the degree of pressure, threat, or tension that exists between firms. In comparison to threat, pressure is more minor in magnitude and more general in nature. Both threat and pressure can create and perpetuate a state of “tension” between rivals. In other words, by studying competitive tension, we are essentially evaluating the aggregate threats and pressures (both perceived and objective) that a firm experiences in order to predict future competitive actions.
potential as opposed to kinetic energy. In contrast, psychology uses tension to convey feelings of fear and anticipation or expresses the build-up of opposing psychological forces.

Perceived competitive tension denotes the extent to which firm managers and industry stakeholders consider a given rival the focal firm’s primary competitor; objective structural tension relates to the ever-changing industry structure or market conditions in which rivals operate. Different manifestations of objective structural tension have been examined directly or indirectly, including market commonality (Chen, 1996), multimarket contacts (Baum & Korn, 1999), and reciprocal threat (Gimeno, 1999). Hence, although both objective and perceptual considerations are essential, the empirical focus of this paper is on perceived tension.

Perceived tension is consequential because a firm ultimately takes action in accordance with the cognitive map its managers construct (Reger & Huff, 1993) and/or with the perception its key outside stakeholders collectively form (Barley, 1983; Porac, et al., 1995; Zuckerman, 1999, 2000), and research so far has yet to explore the implications of such tension for interfirm rivalry. This paper takes the position that perceived tension, as well as competition per se, is a socially constructed phenomenon (c.f., Berger & Luckmann, 1967; White, 1981) and that it can be assessed by industry stakeholders (Chen, et al., 1993).

The social construction view considers competitive tension a collectively negotiated reality involving managerial as well as market expectations. Such a reality explains the complexity of socially shared, interpretive structures of competition (Barley, 1983), affects the pattern of rivalry among firms (Porac, et al., 1995), and influences managerial actions and shapes market outcomes (Zuckerman, 1999, 2000). Indeed, a firm will take actions to engage its rivals to satisfy the expectations of internal and external stakeholders; hence, the construction of perceived tension involves both informed insiders and outsiders of a firm.
The Awareness-Motivation-Capability (AMC) Perspective

Given the vital role of perceived tension in competitor analysis, an important question becomes the identification of its key antecedents. The AMC perspective postulates that three behavioral drivers influence a firm’s decision to take competitive action (or respond): awareness, motivation, and capability (Chen, 1996). Awareness refers to a firm’s cognizance of its rivals and its relationships with each of them. Motivation captures the incentives that drive the firm to engage in rivalry with a competitor. Capability describes the firm’s resource deployment and the decision-making processes that support its ability to engage with rivals. The roots of the AMC perspective are found in the literature of organizational cognition (Dutton & Jackson, 1987), strategic interdependence (Porter, 1980), and the resource-based view of the firm (Barney, 1991).

Individual AMC components have been used in competitive dynamics research (Smith, et al., 2001), and they manifest in a range of variables, including action visibility and firm size (Chen & Miller, 1994) for awareness; territorial interests in different markets (Gimeno, 1999) for motivation; and execution difficulty and information processing (Smith, Grimm, Gannon, & Chen, 1991) for capability. Some other variables, such as TMT characteristics (Ferrier, 2001), correspond to more than one component. Although the AMC perspective has been formalized for the investigation of interfirm rivalry (Chen, 1996), it has yet to be used for the study of pre-battle competitor analysis, and for our purpose, the perceived relationship between rivals.

The current research sets out to reinforce the conceptual link between competitor analysis and interfirm rivalry. As such, it applies the AMC perspective to investigate a selective set of antecedents of perceived tension: relative scale, rival’s attack volume, and resource similarity. We identify these three firm-dyad constructs, among a number of alternatives, because of their conceptual significance in each of the three AMC components. Relative scale, or a competitor’s
operating capacity compared with a focal firm’s (Baum & Korn, 1999), points to the awareness aspect of the AMC perspective. Rival’s attack volume (Ferrier, 2001), or the extent to which the focal firm’s markets are under attack by a given rival’s actions, is used here to capture the motivational effects. Resource similarity (Chen, 1996), or the extent to which a given rival possesses strategic endowments comparable to those of the focal firm, corresponds to capability.

**HYPOTHESES**

This section first applies the AMC perspective to examine how relative scale, rival’s attack volume, and resource similarity influence perceived competitive tension. To show the significance of perceived competitive tension, it then investigates the impact of this construct on the ensuing rivalry between firms. This two-part research model is summarized in Figure 1.

**AMC Antecedents of Competitive Tension**

**Relative scale.** Size, and specifically the scale of an organization’s operation, has long been considered one of the most important contingent variables affecting a firm’s strategy and structure (Hambrick, et al., 1982). Large scale is often associated with market power (Hambrick et al., 1982), and visibility (Smith, et al., 1991). Competitive dynamics research has shown that large firms, or those with great scale or operating capacity, are more recognizable in the industry than smaller firms, and that they differ from their smaller rivals in terms of competitive behavior attributes (Chen & Hambrick, 1995). Larger scale firms, for instance, are more likely to initiate massive attacks on their rivals and are committed to protecting their reputation when attacked.

Conventional strategy wisdom holds that scale (or size in general) is a major source of competitive concern (Baum & Korn, 1999). Relative scale between a rival and a focal firm contributes to the firm’s awareness of the competitive tension imposed by the rival (Chen & Miller, 1994); as a result, relative scale is likely to associate positively with perceived tension.
Hypothesis 1: The greater the scale of a given rival relative to a focal firm, the greater the perceived competitive tension.

**Rival’s attack volume.** The relationship between firms in the marketplace is the most significant factor affecting conjectural variations and sphere of influence (Gimeno, 1999). Porter (1980: 88) noted the significance of market interdependence: “A main characteristic of competition is that firms are mutually dependent: firms feel the effects of each other’s moves and are prone to react to them.” Two firms are head-on opponents and will be motivated to act against each other if they compete directly in many markets (Baum & Korn, 1996; Gimeno, 1999), and, more importantly, they engage each other with moves and countermoves that have direct implications for their shares and success in the marketplace (Chen & Miller, 1994).

Any competitive actions initiated by a rival to attack a firm’s markets (such as entries into new ones or expansion in existing ones) would be considered a direct challenge to the firm (Ferrier, 2001). Tapping into the motivational component of competitive tension, a rival’s attack on a focal firm’s markets, especially those valued by the firm, precipitates the firm’s managers and its outside stakeholders to view this rival as the one which imposes the greatest tension, and forces the firm to act (or react) in defending its turf (Chen & MacMillan, 1992). Baum and Korn’s (1999) finding that rivals with high multimarket contacts are less likely to exit each other’s markets (showing their commitment to staying in the race) provides additional evidence.

Research has identified different characteristics of attack, such as volume and duration (Ferrier, 2001); our study focuses on attack volume, as indicated by the number of actions. A firm will be most motivated—and sensitive to the tension created by its opponent—if the opponent has recently launched a significant number of attacks on its markets. The high volume of rival attacks on a firm’s markets leads to strong perceived tension.
Hypothesis 2: The greater the volume of a given rival’s attacks on a focal firm’s markets, the greater the perceived competitive tension.

**Resource similarity.** Sustained competitive advantage is rooted in the firm’s internal resources and capabilities (Barney, 1991; Peteraf, 1993). Each firm is endowed with different types of strategic resources, and ideally, a firm takes initiatives that fully utilize its resource-based advantages or its “heterogeneous asset bases” (Rumelt, 1984). Firms with similar resources are likely to have comparable capabilities and competitive stances, and thus are likely to target similar sets of customers (Miller & Shamsie, 1996). Heil and Robertson (1991) showed that rivals with similar strategies and structures impose great tension on each other. Though conceptually important, resource similarity (Chen, 1996), which stresses the comparability of types of resources between rivals, has not been subjected to empirical examination.

Indeed, strategic resources are generally rare and scarce within an industry (Barney, 1991); consequently, two firms with similar resource needs are likely to be considered, in the eyes of their managers and industry stakeholders, as direct competitors. As Porac and Thomas (1990: 225) noted: “Two organizations are similar if they share important attributes and hence tap the same resources in the task environment. Because critical resources are usually scarce, similar organizations are usually competitively interdependent.”

These arguments are in line with Gimeno and Woo’s (1996) finding of a positive relationship between the strategic similarity of firms and the degree of their rivalry. Moreover, the more similar such a rival is to the focal firm, the more easily that rival will understand and anticipate the focal firm’s intentions and movements, thereby posing a greater potential challenge (Chen, 1996). The rivals with which the focal firm has the same types of resource endowments are usually considered the most capable competitors and the ones with which the focal firm’s managers and outside stakeholders perceive the greatest competitive tension.
**Hypothesis 3**: The greater a given rival's resource similarity with a focal firm, the greater the perceived competitive tension.

**Competitive Tension and the Implications for Action**

Competitive action has been a vital concern in competitive dynamics research. Scholars have found that a firm tends to act aggressively toward other firms that are visibly present or that threaten its vital markets (Smith, et al., 1991), and have discussed the implications of multimarket rivalry for actions such as market entry (Baum & Korn, 1996) and pricing (Gimeno, 1999). Research has also found that managers and outside stakeholders make similar competitive assessments (Chen, et al., 1993) and that such assessments can predict rival actions taken in the industry (Chen & MacMillan, 1992).

The firm-dyad, perceptual consideration of competitive tension advanced here is consequential. If a firm is perceived by both managers and industry stakeholders to have high tension with a rival, it is likely that the firm will attack the rival’s markets to gain (or re-gain) its relative advantages and to reduce the tension imposed by the rival (Chen & MacMillan, 1992). Thus, perceived competitive tension can lead to ongoing competitive rivalry and should have long-term implications for industry stability (Porter, 1980).

Strong perceived tension increases the volume of attacks on a rival’s markets. However, to gauge precisely the effects of perceived competitive tension on consequent competitive actions, it is important to consider (and, from an empirical viewpoint, to control for) objective structural tension or the dynamics of market structure. Reger & Palmer (1996: 22, emphasis original) note aptly that “managers must be *mindful* to incorporate new information proactively from many sources and to actively disregard old, automatic maps in order to develop reliable maps for changing environment.”
Hypothesis 4: The greater the perceived competitive tension, the greater the volume of firm attacks on the rival’s markets (controlling for objective structural tension).

METHODS

Sample and Data Collection

Our sample includes 13 major airlines competing against each other in the top 10,000 city-pair markets (or routes) during the period of 1989 – 1992. This period was chosen because it is characterized by the rapid entry of new airlines and by the expansion of existing airlines into new routes, followed by an industry consolidation through mergers and acquisitions. The turbulence of this period produced large variations for our investigation of competitive tension and interfirm rivalry (for the history of the US airline industry, see Morrison & Winston, 1995). The US airline industry is an ideal research context because of the acknowledged competitive relationships among the major players, rich sources of public information, well-defined markets, and identifiable strategic resources (Smith, et al., 1991; Gimeno, 1999).

We used both archival and survey data for our research. To identify specific markets each airline served, we obtained data from the Department of Transportation’s Origin-Destination (OandD) Survey of Airline Passenger Traffic. To assess the perceived competitive tension a given airline experienced from each of the other sample airlines, we used a questionnaire mailed in 1991 to informed airline executives and industry stakeholders, including 44 “insiders” (senior executives) and 72 “outsiders” (16 security analysts, 36 consultants, and 20 travel agents). These individuals had participated in a previous airline study that evaluated various competitive moves taken by airlines (Chen & MacMillan, 1992; Chen, et al., 1993). The list of potential informants for the original sample was compiled from several sources, mainly the Winter 1989 edition of the World Aviation Directory. The inside executives were all senior
vice presidents or holders of higher titles (excluding chief executive officers) of the sample airlines. The sample outsiders were selected from various sources: 1) all security analysts who followed the industry and were listed in the 1989 edition of *Nelson Directory of Investment Research*; 2) all consultants listed in the *World Aviation Directory*; 3) top 65 travel agencies (in terms of sales revenues) in the United States.

The questionnaire was pre-tested and professionally produced and distributed, and included two follow-up mailings. The response rates were 39% (n = 16, representing nine airlines) for insiders and 47% (n = 34) for outsiders. Whereas the number of insider respondents per firm ranged from 1 to 4, the number of outsider respondents per firm ranged from 26 to 33. A comparison of respondents and non-respondents suggested they did not differ in their observable characteristics, e.g., firm size and industry and company experience; about 70% of respondents had more than 20 years of industry experience.

**Measures**

**Perceived competitive tension.** We relied on informed insiders and outsiders in our survey to assess perceived competitive tension, and specifically, to evaluate the extent to which a given sample airline can be considered a focal airline’s primary competitor. The informants were asked to identify and rank, from each airline’s viewpoint, its top five rivals from a list of all 12 other competitors. In the scoring scheme, the airline rated as the top-ranked rival of a focal airline received a score of 5; second, a score of 4; etc. Those not included in the ranking

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2 Our pilot study and interviews with airline executives and industry experts suggested that we not survey CEOs, because they generally do not respond to mail surveys.

3 Following an established network methodology, we used a “roster” format in our questionnaire design that provides a comprehensive list of all possible actors for respondents to rank (Waserman & Faust, 1994). An alternative is a “free call” format that asks respondents to generate their own list of actors first and then rank those actors. Although a free recall format tends to be less intrusive, it may reflect a recency effect because respondents may not accurately recall all relevant actors and related information (please see Bernard, Kilworth, Kronenfeld, & Sailer, 1984 for a detailed discussion on informant accuracy and its implications for questionnaire design).
received a score of 0. Scores were then averaged across all responses; thus, each score reflected the degree of competitive tension a focal airline experienced from a given competitor in the eyes of managers and industry stakeholders. We distinguished between insiders (airline executives assessed their own companies) and outsiders (analysts, consultants, and travel agencies) when analyzing the survey responses and constructing our perceived competitive tension measures.

Because the perceptual measures were aggregated for each pair of firms, there was concern about the extent to which the average score for a given pair across all the raters represented a firm’s perception toward each of its competitors. To check for the internal consistency of the raters’ evaluations, we followed the procedure suggested by Shrout and Fleiss (1979) to examine the intraclass correlation coefficients (ICCs) for each of the 13 airlines. The average ICC (1) value of .26 indicated that individual ratings of an airline, evaluated from each of its 12 sample airlines’ viewpoint, are reasonably consistent across all the raters (James, 1982); the average ICC(2) value of .77 suggested that the group means for the competitors’ ratings were stable (Bliese, 2000). Hence, aggregations for each pair of firms were supported.4

**Attack volume.** Whereas the volume of a rival’s attack is an antecedent of perceived tension, the volume of the firm’s attack on a rival is a consequence of the perceived tension in our model. The volume of a rival’s attack is operationalized as the number of entries by the rival into the firm’s routes from 1989 to 1990. The volume of the firm’s attack on a rival’s markets is operationalized as the number of entries, among the 10,000 sample routes, by the firm into the rival’s routes from 1991 to 1992. We consider an airline an incumbent if it had at least a 1% share of a route (Baum & Korn, 1999).

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4 James (1982) reported that ICC (1) values generally ranged between 0 and 0.5, with a median of .12. Our ICC (2) score is comparable with those found in some of the well-cited psychometric research such as Kirkman, Rosen, Tesluk, & Gibson (2004) (with a range between .68 and .79). ICC (1) in their study ranged between .10 and .13.
Relative scale. We operationalize relative scale as a rival airline’s scale divided by the focal airline’s scale during the same period, where scale is available seat miles—a common measure for airline capacity (Bailey, et al., 1985; Taneja, 1985).

Resource similarity. To measure resource similarity we used one of the most vital strategic resources in the airline industry, fleet structure (Taneja, 1989). Acquisition of various types of aircraft and development of fleet structure are the most critical strategic decisions facing airline executives. Thirty-one major types of aircraft were used in this study, conventionally classified on the basis of such parameters as “stage length” (or flight distance) and number of passengers carried (Taneja, 1989). Resource similarity (as proposed by Chen, 1996) for a given pair of airlines can be calculated as follows:

\[
R_{ij} = \sum_{m=1}^{31} \left[ \left( \frac{A_{im}}{A_i} \right) \times \left( \frac{A_{jm}}{A_m} \right) \right]
\]

(2)

where 
- \( R_{ij} \) = Resource similarity that airline j has with the focal airline i
- \( A_{im} \) = Total number of type m aircraft operated by airline i
- \( A_i \) = Total number of aircraft operated by airline i overall
- \( A_{jm} \) = Total number of type m aircraft operated by airline j
- \( A_m \) = Total number of type m aircraft operated by all airlines
- \( m \) = A type of aircraft operated by both airline i and airline j

In calculating \( R_{ij} \), the first term \( \left( \frac{A_{im}}{A_i} \right) \) captures the strategic importance of a given type of aircraft to the focal firm (i). The second term \( \left( \frac{A_{jm}}{A_m} \right) \) reflects the share of a given competitor (j) in this type of aircraft.

We obtained aircraft information from “TPFS” Turbine Airliner Fleet Survey (1990). We “normalized” the results so that the sum of the similarity indices for all of a given firm’s competitors was equal to 1.

Control variables. We included several control variables to rule out possible alternative explanations (cf. Baum & Korn, 1996, 1999). Age, scale, and past performance served as
controls when predicting perceived tension (Hypotheses 1 to 3). To measure age, we counted the number of years since the year of an airline’s founding; to measure scale, we used the natural log of the total available seat miles flown by the airline in the prior year; and to measure past performance, we calculated an airline’s passenger load factor in the prior year. In addition to these firm level characteristics, we also controlled for slack resources given that more slack resources imply more potential for competitive activities (Ferrier, 2001) and may thus influence the perception of competitive tension. We used current ratio to measure slack resources.

Objective structural tension is a critical control variable in examining the effects of perceived tension on ensuing rival action (Hypothesis 4). It captures the extent to which a rival increases its presence in a focal firm’s markets, and it is likely to influence the volume of the focal firm’s attack on the rival. To measure objective structural tension, we adapted Chen’s (1996) formula of market commonality (see Appendix). We also controlled for several important firm-route level characteristics in our analysis. Because a firm’s market entry decision is likely to be affected by conditions of markets served in the prior year, we controlled for the capacity (the natural log of average number of passengers) and route density (average number of incumbents) in routes served by the focal airline in 1991. A firm’s market entry decision may also depend on the number of rivals’ routes not currently served by the focal airline, and the capacity and route density in these routes. In addition, following Baum and Korn (1996, 1999), we included a set of firm-level characteristics, including age, scale, and past performance.

Data Analyses

To model our first dependent variable, perceived tension, at the dyadic level of analysis, we used Multiple Regression Quadratic Assignment Procedure (MRQAP), a regression analytical technique specifically designed for dealing with autocorrelation in dyadic data (see
Krackhardt, 1988, for a detailed explanation of this technique and Tsai, 2002, for a recent application of this technique in examining the pattern of competition). To check the robustness of our results, we performed additional analyses using GLS random effects regression as well as fixed-effects regression (also known as the Least Squares Dummy Variable model). The pattern of results of these additional analyses is the same as those shown in our MRPQAP analysis.

Because our second dependent variable, the volume of the firm’s attack on the rival’s markets, is a count variable, we considered two modeling strategies specially designed for count outcomes: Poisson regression and negative binomial regression models. Given that the Poisson model often underestimates the amount of dispersion in the outcome variable, the negative binomial regression model is adopted to correct for the overdispersion problems. We performed a test for the null hypothesis that the overdispersion parameter ($\alpha$) equals zero for our model (Greene 2003; Long & Freese, 2003). The test statistics ($G^2$) are all very significant and provide strong evidence of overdispersion, suggesting that the negative binomial regression model is preferred to the Poisson regression model. Again following Baum and Korn (1999), we also controlled for important firm-level characteristics to overcome the problems of analyzing relational data (Lincoln, 1984). Since the error terms may be correlated across firms, we estimated all models using robust standard errors.

RESULTS

Table 1 reports means, standard deviations, and correlations for all the independent and dependent variables in this study. As shown in Table 1, the perceived competitive tension measure based on insiders’ responses is highly correlated with the same measure based on
outsiders’ responses (correlation coefficient=0.88, p<0.01), providing some evidence supporting the validity of our perceived competitive tension construct.

-Insert Table 1 about here-

Table 2 presents the regression results showing the effects of the antecedents of perceived competitive tension. Several models were estimated, with models 1 and 2 predicting insiders’ perception, models 3 and 4 predicting outsiders’ perception, and models 5 and 6 predicting the combined perception. These models test our Hypotheses 1 to 3.5

-Insert Table 2 about here-

Hypothesis 1 states that the greater the scale of a given rival relative to the focal firm, the greater the perceived tension. As shown in Table 2, the coefficient for relative scale is positive and statistically significant for insiders’ (p<0.05), outsiders’ (p<0.05), and combined (p<0.01) perceptions. Thus, Hypothesis 1 is confirmed. Hypothesis 2 states that the greater the volume of a given rival’s attack on the focal firm’s markets, the greater the perceived tension. The coefficient for rival’s attack volume is positive and statistically significant for insiders’ (p<0.05), outsiders’ (p<0.05), and combined (p<0.05) perceptions. Hypothesis 3 is clearly confirmed. Hypothesis 3 suggests that the greater a given rival’s resource similarity with the focal firm, the greater the perceived tension. The coefficient for resource similarity is positive and marginally significant for insiders’ perception (p<0.10), and is positive and statistically significant for outsiders’ (p<0.05), and combined (p<0.05) perceptions. Overall, Hypothesis 3 is supported.

Table 3 presents the results of negative binomial regression predicting the volume of a focal firm’s attack on a rival. Several models were estimated to test our Hypothesis 4. Model 1

5 We have 13 sample airlines which result in 156 (or 13x12) pairs of perceived competitive tension observations. The number of observations is 108 (or 9x12) for insiders’ perception because we only have data from executives of nine airlines, each evaluating 12 competitors.
is the baseline model with only the control variables. Model 2 estimates the effect of insiders’ perception of competitive tension. Model 3 estimates the effect of outsiders’ perception of competitive tension. Model 4 combines insiders’ and outsiders’ perceptions into one measure and estimates the effect of this combined measure.

**-Insert Table 3 about here-**

Hypothesis 4 states that perceived tension, controlling for the effect of objective structural tension, increases the volume of a focal firm’s attack on a rival’s markets. As shown in Table 3, the coefficient for insiders’ perceived tension is positive but not statistically significant, suggesting that insiders’ perception does not have a significant impact on the firm’s consequent attack volume. The coefficient for outsiders’ perceived tension is positive and statistically significant (p<0.05), suggesting that outsiders’ perception significantly influences the volume of the firm’s attack. Given the high correlation between insiders’ and outsiders’ perceptions, it is surprising to see that they do not have the same impact on attack volume in our analysis. The non-significant result of insiders’ perception may result from the limited number of insiders’ responses in our study. When combining insiders’ and outsiders’ perceptions into one measure, the coefficient for the combined measure is positive and statistically significant (p<0.05). Overall, Hypothesis 4 is only supported when we use outsiders’ perception or combined perception of competitive tension. Such support was found with the control of objective structural tension, which also yields its own independent positive effect on the firm’s attack volume (p<0.01).

**DISCUSSION**

Anchored in the social construction view of competition, the paper speaks to the perceptions, the level of competitive apprehension or anticipation that decision makers and
industry stakeholders feel as they observe, filter, and enact competitive “information” and what, exactly, a firm should do (strategically or competitively speaking) about it. It conceptualizes competitive tension, a construct intended to close a significant gap in the strategy and competitor analysis literature (Hodgkinson & Sparrow, 2002; Hitt, et al., 2005). The firm-dyad conceptualization of competitive tension contrasts with the prevailing consideration of direct (Peteraf & Bergen, 2003) and core (Porac, et al., 1995) competitors as mostly homogeneous. It provides a refined conceptualization of the competitor by differentiating the varying degrees of tension each of a firm’s rivals imposes on the firm. The significance of the proposed construct is clearly shown by its behavioral outcomes: perceived tension, even controlling for objective structural tension, was found to affect a firm’s consequent actions against a given rival.

The promise of the AMC perspective lies in its integrative consideration of the three antecedents and by the demonstration of their influence on perceived competitive tension. The AMC perspective is a natural outgrowth from findings in competitive dynamics research, and each of its components has been shown to be empirically significant in explaining the behavioral exchange of competitive moves (Smith et al., 2001). This paper extends this theoretical perspective and tests it empirically within the context of competitor analysis. Not only does the perspective have the potential to advance competitor analysis and interfirm rivalry research, it may also illuminate our understanding of interfirm actions and relationships in general. Moreover, it can provide an important bridge between micro and macro organizational literature, as attempted earlier by Dutton and Jackson (1987) and Chen and Miller (1994).

Finally, by treating competitive tension as a perceptual phenomenon anteceded by objective AMC factors, this study forges an important link between competitive dynamics and cognitive competitor mapping research. Efforts of this kind are critical to the advancement of
both research streams. The findings here suggest that in the absence of perceptual assessment of competitors, three theoretically derived objective indicators can be used. Moreover, the paper’s social construction view of competitive tension shows the relevance and significance of industry stakeholders’ perception in competitor analysis and interfirm rivalry—a promising, yet unexplored area in the extant literature.

Taken as a whole, the current research brings to the integrative study of competitor analysis and interfirm rivalry a conceptual and empirical fusion of the contrasting approaches of competitive dynamics and cognitive competitive mapping. As such, it also offers evidence that objective AMC indictors can be used to predict perceived tension between rivals, which in turn influences future observable market behaviors.

**Implications**

The implications of this research are manifold. First, the firm-dyad conceptualization is critical because significant differences exist even among direct rivals. Each firm experiences a different degree of tension with each rival, and from the firm’s point of view each rival is unique. Our findings show that a high perceived competitive tension between a focal firm and a rival plants the seed for the firm’s encroachment into this rival’s markets. The issues may help advance research in strategic group (Reger & Huff, 1993), multipoint competition (Baum & Korn, 1996; Gimeno, 1999), competitive aggressiveness (Ferrier, 2001), organizational cognition (Labianca, et al., 2001), and interorganizational relationship (Oliver, 1990).

Second, the social perceptual construction of competitive tension and the treatment of the three AMC predictors as objective phenomena point to a fundamental concern in strategy research: the extent to which these two perspectives may correspond. Indeed, these contrasting perspectives have been used to examine key strategy constructs such as environment (Boyd,
Dess, & Rasheed, 1993), strategic group (Reger & Huff, 1993), and market structure (Baum & Korn, 1996). This study provides empirical evidence of their correspondence in competitor research, while extending integrative efforts by researchers in cognitive classification (Reger & Palmer, 1996) and in competitive dynamics (Jayachandran, et al., 1999; Ferrier, 2001).

Third, due to the sensitivity of insider perceptual information it is often difficult for researchers to determine how strategists prioritize their rivals and gauge the tension each imposes. Our findings suggest that absent perceptual competitor information provided by airline managers, outsiders’ perceptions reliably indicate how a firm differentiates among a set of direct rivals. To go a step further, whereas insiders’ perceptions capture a focal firm’s managerial aspirations, outsiders’ perceptions reflect influential industry stakeholders’ views of the firm’s competitive (Chen, et al., 1993) and strategic (Zuckerman, 1999, 2000) reality. How these two perceptions converge or diverge in different settings may provoke a debate on the relative importance of managerial cognition in social construction, and should encourage researchers to revisit, within the context of competitor analysis and interfirm rivalry, the question, “How much do managers matter?” Managers in our study may not have much discretion to act beyond industry stakeholders’ expectations due to the nature of airline competition (cf. Finkelstein & Hambrick, 1990). Our findings echo some anecdotal evidence on the importance of stakeholders’ perceptions for competitive actions in some mature industries (Chen & MacMillan, 1992). However, we have to interpret our findings on insiders’ perceptions with caution, given that only a relatively small number of insiders responded to our survey.

Although the empirical focus of this paper is on perceived tension, our conceptualization of competitive tension includes objective structural tension. The use of objective structural tension as a control variable in the analyses and the finding of its independent impact on
consequent competitive actions lends further support to previous research that has shown, directly or indirectly, its empirical significance (Baum & Korn, 1999; Gimeno, 1999). It should be noted, however, that our conceptualization of objective structural tension considers the dynamics in market structure (specifically, the change in market commonality (Chen, 1996) between a rival and a focal firm), in contrast to previous treatment of it as a static structural variable. Indeed, both the static and dynamic aspects of market structure are important in the conceptualization of objective structural tension.

The current study also has practical implications. First, the AMC perspective is intuitively appealing and easily understood by strategists, who can rely on objective indicators to assess the level of competitive tension imposed by each rival and allocate firm resources accordingly. Also, competitive tension, which has been shown to affect future competitive behaviors, may have implications for organizational performance, and research along this line will help advance the promise of this construct.

**Limitations and Future Directions**

This study takes a significant first step toward the perceptual differentiation of competitors, but may be limited by its focus on existing industry rivals. Future research should consider potential or “unseen” rivals or those outside of the industry (Porter, 1980), “peripheral” competitors (Porac, et al., 1995). Indeed, the role of industry stakeholders may be even more critical in the social perceptual construction of competitive tension, since outsiders are likely to have more differentiated visions of a firm’s competitive outlook.

Because information is relatively public in the airline industry, the correspondence between perceptions and objective reality, as well as insiders’ and outsiders’ opinions, tends to be high—which may not be the case in other industries—and some of our measures can be
improved. The use of a ranking scheme to measure perceived competitive tension, though able to offer respondents a clear frame to compare and prioritize a focal firm’s competitors, does not represent the exact distance between the focal firm and each competitor. In addition, the use of fleet structure to measure resource similarity, though appropriate in the airline context, may not get into the heart of the “sticky” or process aspects of firm resources (Barney, 1991), an area awaiting further investigation. Future research could also perform a longitudinal study of the interrelationships between awareness, motivation, and capability indicators under various industry conditions, and extend this promising perspective with the aim of developing a predictive theory, not only of competitive action, but also of organizational action in general.

Finally, one of the implicit premises of this research is that the competitive relationship between a pair of firms can be asymmetric: the tension that a rival imposes on a focal firm may not be equal to the tension the focal firm imposes on the rival (c.f., Chen, 1996). In the future, it would be useful to examine the extent to which perceived tension between a pair of firms differs, and what the behavioral implications are for perceptual asymmetry.

In sum, this paper examines an important missing element in current competitor research: the idea of competitive tension. Understanding how firms view each other, in the eyes of insiders and outsiders, from the angles of scale or capacity, market action, and resource profile can help reveal their awareness, motivation, and capability for interfirm rivalry.
REFERENCES


Jayachandran, S., Gimeno, J., & Varadarajan, P.R. 1999. Theory of multimarket competition: A


New York: Free Press.


Figure 1. A Model of Competitive Tension

<table>
<thead>
<tr>
<th>Awareness-Motivation-Capability (t₁)</th>
<th>Competitive Tension (t₀)</th>
<th>Outcome (t₁)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Scale</td>
<td>Perceived Competitive Tension - Managerial (Insider) Perception - Industry Stakeholder (Outsider) Perception</td>
<td>Volume of Attack on Rival</td>
</tr>
<tr>
<td>Rival’s Attack Volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource Similarity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective Structural Tension (Control)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

H1, H2, H3, H4
### TABLE 1  
Means, Standard Deviations, and Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>1 Volume of attack on rival 1991-1992</td>
<td>81.98</td>
<td>95.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Perceived competitive tension-insiders</td>
<td>1.24</td>
<td>1.65</td>
<td>.37**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Perceived competitive tension-outsiders</td>
<td>1.19</td>
<td>1.33</td>
<td>.56**</td>
<td>.88**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Objective structural tension</td>
<td>0.00</td>
<td>0.02</td>
<td>.28**</td>
<td>.20*</td>
<td>.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Relative scale</td>
<td>2.89</td>
<td>4.90</td>
<td>-.16+</td>
<td>.27**</td>
<td>.33**</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Volume of rival’s attack 1989-1990</td>
<td>82.69</td>
<td>113.50</td>
<td>.58**</td>
<td>.29**</td>
<td>.36**</td>
<td>.11*</td>
<td>-.24**</td>
<td></td>
</tr>
<tr>
<td>7 Resource similarity</td>
<td>0.08</td>
<td>0.07</td>
<td>.52**</td>
<td>.46**</td>
<td>.57**</td>
<td>.10</td>
<td>.29**</td>
<td>.33**</td>
</tr>
</tbody>
</table>

+ p< 0.10; * p< 0.05; ** p<0.01  
N=156, except for volume of attack on rival (132) and perceived competitive tension-insiders (108)
TABLE 2
Effect of AMC on Perceived Competitive Tension

<table>
<thead>
<tr>
<th>Variable</th>
<th>Perceived Competitive Tension</th>
</tr>
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<tr>
<td></td>
<td>Insiders</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Airline i’s age</td>
<td>0.001</td>
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<tr>
<td>Airline i’s past performance</td>
<td>0.157</td>
</tr>
<tr>
<td>Airline i’s slack resources</td>
<td>-0.200 *</td>
</tr>
<tr>
<td>Airline j’s age</td>
<td>0.018</td>
</tr>
<tr>
<td>Airline j’s past performance</td>
<td>1.967</td>
</tr>
<tr>
<td>Airline j’s slack resources</td>
<td>-1.911</td>
</tr>
<tr>
<td>Relative scale</td>
<td>0.069 *</td>
</tr>
<tr>
<td>Rival's attack volume</td>
<td>0.002 *</td>
</tr>
<tr>
<td>Resource similarity</td>
<td>3.544 +</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.177</td>
</tr>
<tr>
<td>N</td>
<td>108</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.093</td>
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</table>

+ p< 0.10; * p< 0.05; ** p<0.01
TABLE 3
Effect of Perceived Competitive Tension on Attack Volume

<table>
<thead>
<tr>
<th>Variable</th>
<th>Models</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Airline i’s age</td>
<td>-0.008</td>
<td>-0.027**</td>
<td>-0.009</td>
<td>-0.009</td>
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<tr>
<td>Airline i’s scale</td>
<td>2.426**</td>
<td>2.748**</td>
<td>2.363**</td>
<td>2.364**</td>
</tr>
<tr>
<td>Airline i’s past performance</td>
<td>-7.154</td>
<td>38.800*</td>
<td>-6.964</td>
<td>-6.996</td>
</tr>
<tr>
<td>Capacity of airline i’s routes</td>
<td>2.182**</td>
<td>-0.022</td>
<td>2.140**</td>
<td>2.144**</td>
</tr>
<tr>
<td>Airline i’s average route density</td>
<td>1.251**</td>
<td>-0.312</td>
<td>1.268**</td>
<td>1.270**</td>
</tr>
<tr>
<td>Airline j’s age</td>
<td>-0.022**</td>
<td>-0.017**</td>
<td>-0.025**</td>
<td>-0.025**</td>
</tr>
<tr>
<td>Airline j’s scale</td>
<td>0.759**</td>
<td>0.602**</td>
<td>0.670**</td>
<td>0.670**</td>
</tr>
<tr>
<td>Airline j’s past performance</td>
<td>0.313</td>
<td>-0.343</td>
<td>2.067</td>
<td>2.072</td>
</tr>
<tr>
<td>Capacity of j’s routes not served by i</td>
<td>0.024</td>
<td>0.315</td>
<td>-0.062</td>
<td>-0.065</td>
</tr>
<tr>
<td>Average route density of j’s routes not served by i</td>
<td>1.184**</td>
<td>1.447**</td>
<td>1.132**</td>
<td>1.132**</td>
</tr>
<tr>
<td>Number of j’s routes not served by i</td>
<td>0.000**</td>
<td>0.000*</td>
<td>0.000**</td>
<td>0.000**</td>
</tr>
<tr>
<td>Objective structural tension</td>
<td>7.447*</td>
<td>11.163**</td>
<td>8.118**</td>
<td>8.039**</td>
</tr>
<tr>
<td>Perceived competitive tension</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Insiders</td>
<td>0.055</td>
<td></td>
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<td></td>
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<tr>
<td>Outsiders</td>
<td>0.150*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All combined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-76.322**</td>
<td>-86.533**</td>
<td>-73.327**</td>
<td>-73.342**</td>
</tr>
</tbody>
</table>

N 132\textsuperscript{a} 108 132 132
Likelihood ratio test 266.11** 243.04** 272.08** 272.18**

\textsuperscript{a} The sample size was reduced from 156 (in Table 2) to 132 due to the loss of 24 observations associated with Pan Am and Midway Airlines which declared bankruptcy in 1991.

\(+ p<0.10; * p<0.05; ** p<0.01\)
APPENDIX: FORMULA USED TO COMPUTE MARKET TENSION

Market Tension = M_{ij, 1991} - M_{ij, 1990}

where $M_{ij}$ is the degree of market commonality that airline $j$ has with the focal airline $i$

$$M_{ij} = \sum_{k=1}^{10,000} \left[ \left( \frac{P_{ik}}{P_i} \right) \times \left( \frac{P_{jk}}{P_k} \right) \right]$$

- $P_{ik}$ = Total number of passengers served by airline $i$ in route $k$
- $P_i$ = Total number of passengers served by airline $i$ across all routes
- $P_{jk}$ = Total number of passengers served by airline $j$ in route $k$
- $P_k$ = Total number of passengers served by all airlines in route $k$
- $k$ = A route jointly served by airline $i$ and airline $j$

In calculating $M_{ij}$, the first term ($P_{ik}/P_i$) captures the strategic importance of a shared market to the focal firm ($i$). The second term ($P_{jk}/P_k$) reflects the market share of a given competitor ($j$) in this shared market.