Alliance Experience and Service Quality

Zhe Zhang* and Bruce Barringer**

ABSTRACT

Firms' capability of effectively managing alliances has become a key source of sustainable competitive advantages. Extant alliance literature suggests that alliance management capability stems primarily from alliance experience. This paper investigates whether firms with alliance experience are effective in managing complex alliance relationships to deliver quality services.

This paper relied exclusively on the longitudinal quarterly data of nine U.S. major airlines over a 20-year period between 1988 and 2007. Alliance data were collected from the Securities Data Company (SDC) database. Quarterly service quality data were collected from the Air Travel Consumer Report published by the U.S. Department of Transportation (DOT). To detect the temporal effects of alliance participation on service quality, a three-month lag was created between the alliances data and the service quality data.

The results suggest that the effects of alliance experience are more complex than initially proposed such that the moderating effects of alliance experience are conductive to only certain dimensions of service but detrimental to others.

Field of Research: Strategic Management

———

*Dr. Zhe Zhang, Department of management, marketing and administrative communications, Eastern Kentucky University, USA.
Email: zhe.zhang@eku.edu
**Dr. Bruce Barringer, Department of management, Oklahoma State University
USA. Email: bruce.barringer@okstate.edu

1.INTRODUCTION

Alliance participation enables firms to obtain various benefits such as market entry, cost reductions, and increased market competitiveness (Barringer & Harrison, 2000) that are difficult for them to obtain on their own. Yet, the alliance benefits do not materialize if the alliances are not managed properly.

Consider the alliance formed between America West and Continental in 1995. This alliance allowed both airlines to code share. Code sharing is "a commercial agreement between two [or more] airlines under which an airline operating a service allows another airline to offer that service to the traveling public under its own flight designator, even though it does not operate the service" (Rhoades & Lush, 1997, p. 109). Participating in code sharing alliances enabled both airlines to increase revenues through expanded market scope, enhance passenger benefits, and reduce costs through sharing airport facilities.

First, this alliance allowed both airlines to increase revenue through market expansion. Under the code sharing agreement, America West sold a Continental flight under America West's name (i.e., designator code) as if America West operated that flight, and vice versa. Both airlines accessed a broader market without operating their own aircrafts in the extended market. Often cited as an alliance success model, this alliance was said to generate approximately $40 million for Continental and $30 million for America West in revenues each year (McCartney, 1998).

Second, the America West-Continental alliance also enhanced both airlines' revenues because of their enhanced customer benefits, making other airlines competing on the same routes unpopular. The America West-Continental alliance provided at least two important benefits to their customers. First, by taking the allied flights, passengers could have a seamless travel experience, i.e., reaching more destinations with one ticket and without the trouble of re-checking baggage at connections. Second, passengers obtained enhanced frequent flier program benefits by flying the allied routes. America West's frequent fliers could earn miles on Continental's routes (e.g., Europe), where America West did not fly to on its own. As a result, Southwest lost its customers to the America West-Continental alliance and had to reduce its capacity between Phoenix (the base of America West) and Houston (the base of Continental) by 10% in 1996 and 1997 (McCartney, 1998).

Third, this alliance reduced both airlines' costs through sharing activities. Facility sharing is a very common practice of airline alliances because economies of scale can be obtained by sharing economic activities to reduce the production costs per unit. Airline alliances often reduce costs through airport facility sharing, joint advertising and promotion, and joint purchase of products and services. For example, Star alliance (a large airline alliance) began sharing electronic ticketing

services among its 15 airline members in 2005. This service eliminated unnecessary operating procedures between airline alliance partners and reduced ticketing costs up to $7 per ticket (Kleymann & Seristö, 2004). Given the benefits of cost reduction, America West and Continental also shared their activities, such as joint ticketing and baggage handling at many airports.

Alliance participation seems to be an excellent strategy to enhance firm performance. Yet, alliance management is difficult and time consuming (White & Lui, 2005; Ireland et al., 2002) because providing “seamless” travel services requires “seamless” coordination and cooperation between alliance partners. On one hand, alliance partners are independent entities after alliance formation in that there is no hierarchical authority involved between partners and each partner retains its own organizational autonomy. On the other hand, partners are also interdependent because each partner’s cooperation is needed to accomplish the alliance tasks (Inkpen,2001). This interplay of independence and interdependence demands substantial organizational flexibility, managerial time and effort to manage alliances. However, since managers are only boundedly rational (March & Simon, 1958), they are limited in their available time and effort. Despite their best effort, as the alliance activities become more complex, boundedly rational managers may fail to effectively manage alliances.

The America West-Continental alliance backfired because the complexity involved in managing the interdependent alliance tasks performed by independent airlines led to a tremendous drop in service quality (McCartney, 1998). This alliance was intended to provide “seamless” travel experience for passengers so that customers did not need to re-check baggage at connections and could use one ticket to travel on partners’ flight; unfortunately, the expected “seamless” travel experience turned out to be a “bumpy” ride for several reasons. First, airlines are inherently hierarchical organizations with many system constraints and are not structurally flexible enough to change. Gregory Brenneman, Continental's president and chief operating officer, said, "It’s hard to go out and change your system and move employees around that's what creates heartburn and slows implementation down"(McCartney, 1998, p.B.1). Due to the limited availability of gates at each concourse at Phoenix airport, it took quite a while for Continental and America West to be able to operate from the same concourse at that airport. Also, When America West sold tickets to Hawaii on Continental, the two airlines could not operate from the same gate in the same terminal at Los Angeles International Airport. Such structural constraints created enormous confusion at the airports. Passengers checked in at one concourse, but later found that their flight departed from a different concourse on a different airline. Their baggage was handled by a different airline without their prior knowledge, or even worse, their baggage was lost.

Second, the required interfirm coordination may further tax the efforts and limited available time of the already busy airline managers because simply putting each other’s flight numbers on their own flights did not mean that their computer

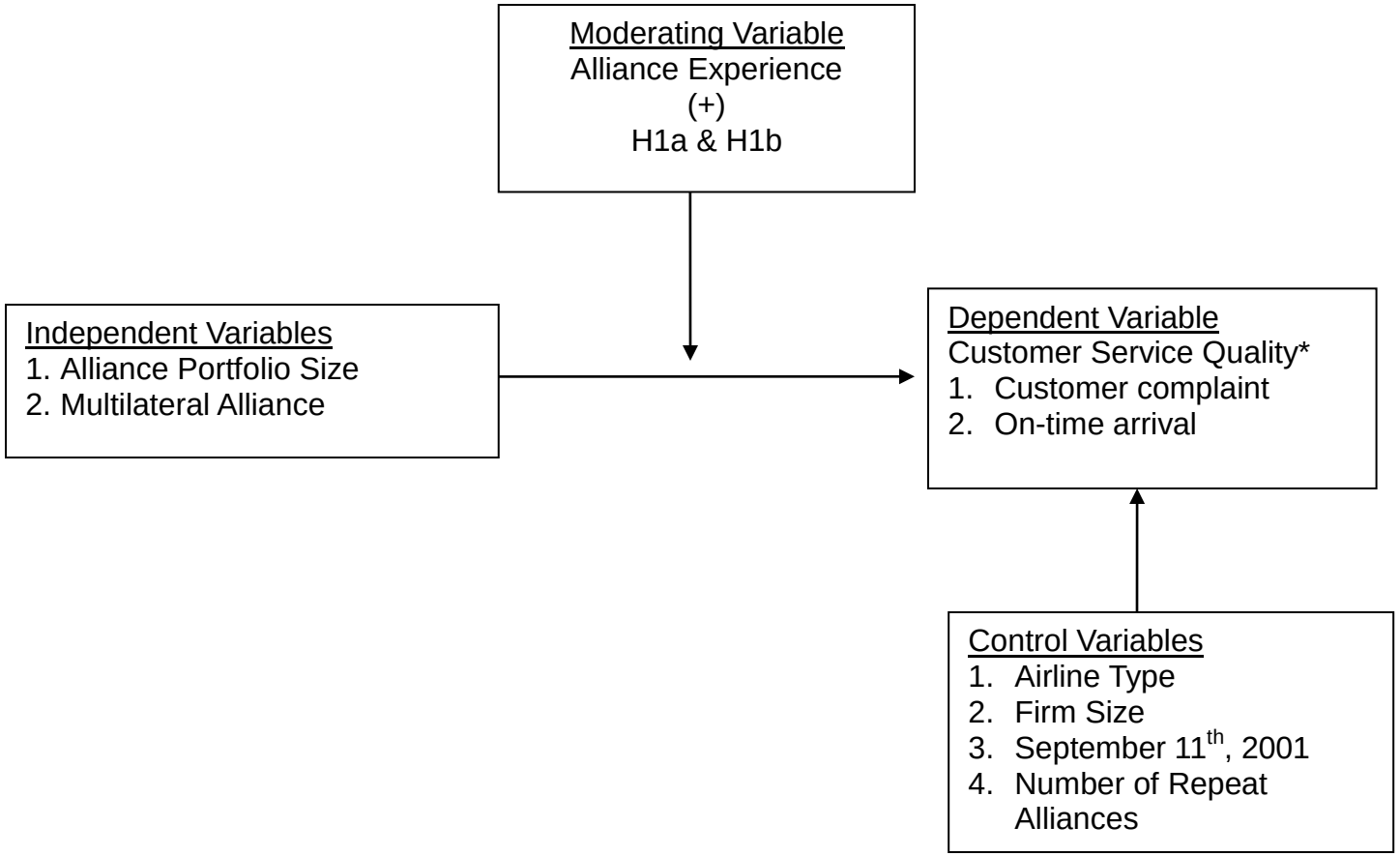
systems would readily coordinate. Third, unlike R & D alliances in high-tech industries, airline alliances are unique in that they involve the entire organization to jointly produce the service experience, rather than just one group of employees. Regrettably, there is a general lack of cooperation by the employees at both airlines. In Houston, Continental ground workers often gave their flights preferential treatment over those of America West. In return, America West's treated Continental's flight with similar attitude in Phoenix. Consequently, the number of flight delays, late arrivals, flight cancellations and consumer complaints of both airlines soared (McCartney, 1998). Despite the financial benefits to both airlines and potential customer benefits, the alliance was terminated because the alliance benefits did not outweigh the problems incurred. This America West-Continental alliance failure shows the paramount importance of effective alliance management.

The purpose of this paper is to enhance our knowledge of alliance management. Drawing on the recent research on alliance management capability (Hoang and Rothaermel, 2005, Rothaermel and Deeds, 2006), a conceptual model is presented in Figure 1 to examine whether firms with more alliance experience are more capable of managing the effects of alliance portfolio size and multilateral alliances on service quality.

This paper makes the following important contributions. First, this paper contributes to alliance management capability literature by investigating service quality as outcome variable. Previous alliance management capability research has not examined whether alliance experience matters in terms of customer service quality. This paper fills this knowledge gap.

Second, this paper also contributes to services quality literature by bringing alliance variables into the mix. To explore the antecedents of service quality, researchers have examined the various antecedents pertaining to customer characteristics, employee management, and firm characteristics. Unfortunately, only limited attention has been paid to alliance effects on service quality. Yet, several recent studies suggest that alliances are an important source to understand the variances in service quality of firms (e.g., Bourdeau, Cronin, & Voorhees, 2007; Weber & Sparks, 2004; Tsantoulis & Palmer, 2008). This paper fills the knowledge gap pertaining to the alliance effects on service quality, which is important but have not received empirical investigation.

Figure 1: Conceptual Model



*Each dimension is tested independently

Third, in contrast to the perceptual measures of service quality, which most of prior research has used, we relied on longitudinal archival data. The most widely accepted definition of service quality (SERVQUAL) is provided by Parasuraman, Zeithaml and Berry in 1988. Believing quality is in the eyes of the customers, they defined quality as “the consumer's judgment about an entity's overall excellence or superiority…[service quality] results from a comparison of expectations with perceptions of performance” (Parasuraman, Zeithaml & Berry, 1988, p. 15). The SERVQUAL approach is cross-sectional in nature and provides only limited information on causal inference between independent and dependent variables. Little research has used objective, longitudinal archival data to study service quality. In a review of service quality literature, Zeithaml (2000) called for longitudinal studies and said that “virtually all of the research looking at the associations have been cross-sectional studies spanning companies and industries… Longitudinal approaches that involve satisfaction and financial performance data in individual firms are a needed approach…” (p. 73). Employing longitudinal archival data allows researchers to test temporal precedence, which is critical to detect causality (Cook & Campbell, 1979).

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

For clarity, definitions of alliances, multilateral alliances, alliance networks and alliance portfolios are warranted, because these terms are closely related but distinct constructs. Alliances refer to “cooperative arrangements between two or more firms to improve their competitive position and performance by sharing resources” (Ireland, Hitt & Vaidyanath, 2002, p. 413). Alliances encompass a broad range of interfirm collaborations such as joint ventures, licensing agreements, research and development projects, joint purchasing, and manufacturing activities (Barringer & Harrison, 2000).

An alliance can be further classified as a bilateral or a multilateral alliance based on the number of partners involved in an alliance. A bilateral alliance is characterized with dyadic interfirm collaborations between two partners. In contrast, a multilateral alliance involves at least three alliance partners. Some scholars also use multiparty alliances (Zeng & Chen, 2003), multifirm alliances (Hwang & Burgers, 1997), and alliance constellations (Das & Teng, 2002; Lazzarini, 2007) to refer to multilateral alliances. This distinction between bilateral and multilateral alliances is important, because bilateral and multilateral alliances differ substantially with respect to alliance management complexities such as governance complexity, coordination costs, transaction uncertainty, degree of opportunism, and payoff structures (Hwang & Burgers, 1997; Das & Teng, 2002; Zeng & Chen, 2003).

Recently, academic attention has shifted from single alliance management to alliance portfolio management. Hoffman (2007) argued that the effects of a firm's alliance strategy do not simply depend on the success or failure of managing one or two alliances but on the success of failure of its bundle of alliances. While both bilateral and multilateral alliances describe single alliances, scholars use 'alliance network' and 'alliance portfolio' to describe multiple alliances. An alliance network is a set of alliances connected by a focal firm (Jarrilo, 1988). Since network ties and tie strengths are not the focus of this paper, we use 'alliance portfolio,' which is similar to the concept of egocentric alliance network, to refer to all the existing alliances the focal firm has (Hoffman, 2007).

Alliances are difficult to manage because of the various risks inherent in the interfirm relationships. Barringer and Harrison (2000) provided a list of the various alliance risks, which include loss of technological knowhow, management complexity, interfirm cultural clash, and partial loss of decision autonomy. Das and Teng (2001) categorized the various alliance risks into two major types of alliance risks. The first risk is relational risk that refers to the extent to which partners are willing to cooperate. Due to bounded rationality and environmental uncertainty, managers can never draft complete contracts that anticipate all the possible problematic scenarios in the process of cooperation. This contractual incompleteness gives rise to a variety of opportunistic behaviors that may lead an opportunistic partner to focus on its own private benefits rather than the common benefits to all participating firms. The relational risk management focuses on curbing opportunistic behaviors.

Scholars have extensively examined the effects of interfirm trust and contractual mechanism on opportunistic behaviors. Trust is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intention or behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998, p. 395). Many scholars have suggested that trust is an indispensible element for successful interfirm relationships (Ireland et al., 2002). Since trust is defined as the willingness to be vulnerable to others' behaviors, selecting trustworthy partners, effective communications, and interfirm adaptation are necessary to generate trust (Das & Teng, 1998).

In brief, to reduce the relational risks that stem from partners' opportunistic behaviors, the literature suggests that interfirm trust and contractual governance are effective and complementary mechanisms. This underscores the importance of careful partner selection, crafting comprehensive, flexible, and customized contracts before alliance formation, and effective interfirm communication and adaptation after alliance formation. However, given the effectiveness of these approaches to avoid opportunism, it requires much of

the managers' time and effort to apply these approaches to minimize relational risks.

The second risk is performance risk, which refers to "the probability and consequences that a firm's strategic objectives are not achieved, despite full cooperation" (Das & Teng, 2001, p. 8). Alliance management complexity grows as the alliance task scope, alliance task depth or the partner diversity increases (White & Lui, 2005). Alliance task scope refers to the area of the alliance task interface between the partners, and it increases as the range of joint tasks covers broader geographic, hierarchical, market, or technological scope of the joint task increases. Alliance task depth refer to "the intensity of interaction between the partners and could be measured, for example, by the man-hours that each devote to a common task" (White & Lui, 2005, p. 916). As the alliance task scope or alliance task depth increases, the coordination needs require greater amount of managerial time and effort to coordinate the alliance tasks. Partner diversity refers to the extent to which the partners' profiles differ. Even though resource and capability complementarities are motivators to participate in alliances, the partner diversity may also be related to coordination difficulties, because differences in national culture, organizational culture and operating routines make an alliance difficult to manage.

Alliance portfolio size and multilateral alliance under investigation in this paper are associated with alliance management complexity. Alliance portfolio size is the number of alliances an airline simultaneously manages. Participating in a large number of alliances potentially enables firms to access valuable resources, technological expertise, and information. As alliance portfolio size increases, so does either the alliance task scope or depth. Multilateral alliances differ from bilateral alliances in both alliance task scope and alliance task depth. A multilateral alliance involves at least two partners. Participating in multilateral alliances allows firms to access broader market scope. However, multilateral alliances require greater degree of interfirm coordination and mutual adjustments to accommodate the needs of multiple partners than do bilateral alliances.

In the context of U.S. airline industry, the fierce competition puts airlines' survival often at stake. Since the U.S. airline deregulation in 1978, due to the partial loss of market protection of their markets, airlines have faced fierce market competition. Between 1979 and 1989, 14 airlines exited the U.S. airline industry (Williams, 2001), and 5 out of 11 U.S. major airlines (i.e., ATA airlines, Delta, Northwest, United Airlines, and US Airways) simultaneously filed for bankruptcy in 2005. Airline managers constantly face pressures to contain costs and enhance revenues merely to secure organizational survival. However, there are regulatory constraints that make going it alone unpopular. For example, market expansion is severely constrained by regulations, limited availability of airport infrastructure, and high acquisition costs of aircrafts.

Some regulations stipulate that an airline needs government approval to fly a desired route and that a majority of an airline's equity be held by a domestic organization. The limited availability of infrastructure (e.g., available terminal space and slots) is another important barrier for an airline to access some markets on its own. Moreover, market expansion through merger and acquisition incurs considerably higher costs such as purchase of new aircrafts to accommodate the increased passenger volume. Alliance participation helps airlines circumvent the above-mentioned constraints. For instance, a code sharing alliance allows airlines to access the markets of their partners that have been already approved by the government and to use their partners' airport infrastructure (Kleymann & Seristö, 2004).

Allying per se does not automatically lead to alliance benefits because the relational and performance risks may dampen the anticipated alliance benefits. Managing these risks is a difficult organizational activity due to the inherent complexities and uncertainties. Firms differ systematically in their capabilities of managing alliances (Rothaermel & Deeds, 2006). Therefore, alliance management capability, defined as "a firm's ability to effectively manage multiple alliances" (Rothaermel & Deeds, 2006, p. 403), is a key source of competitive advantage.

Most of the work on alliance management capability focuses on alliance experiences as a key source of alliance management capability. Drawing primarily from organizational learning and dynamic capability arguments, this line of research suggests that alliance management capability is a path-dependent capability accumulated from a firm's previous alliance experience (Rothaermel & Deeds, 2006). The notion of alliance experience is that firms may learn to effectively manage alliances. Learning theory suggests that the absorptive capability of the firm depends on its existing stock of knowledge (Anand & Khanna, 2000). Cohen and Levinthal (1990, p. 128) suggested that "prior related knowledge confers an ability to recognize the value of new information, assimilate it, and apply it to commercial ends. These abilities collectively constitute what we call a firm's absorptive capability." Rothaermel and Deeds (2006) argued that firms with more alliance experience have higher absorptive capability in learning to manage alliances, because firms learn to effectively manage relational risks and performance risks by building interfirm trust, becoming more informed about the operational models of the alliances, and setting up routines to solve conflicts.

In studying the moderating effects of alliance experience on the relationship between alliance portfolio attributes and customer service quality, we focus on the general alliance experience that refers to a firm's cumulative experience with alliances (Rothaermal & Deeds, 2006). Zollo, Reuer and Singh (2002) found that relation-specific alliance experience has positive effects on alliance performance because it helps partners routinize the alliance coordination. However, Hoang and Rothaermel (2005) found that the general alliance experience of the biotechnology partners is positively related to alliance project performance, and relation-specific experience has a negative effect on alliance project performance. Consequently, this paper focuses on general alliance

experience rather than relation-specific experience.

Recent research suggests that alliance experience has significant positive effects on alliance performance. Zollo and Winter (2002) found that alliance experience with the same partner over time positively impacted the alliance performance of subsequent alliance between these two partners. Rothaermel and Deeds (2006) found that a firm's alliance experience improves its product innovations. Reuer, Zollo and Singh (2002) reported that firms with alliance experiences in similar technological fields are less likely to engage in post formation governance changes in a subsequent alliance. Anand and Khanna (2000) found that firms with greater prior alliance experience have significantly higher stock market returns from alliance announcements than firms without alliance experience. Simonin (1997) found that firms with greater alliance experience have higher abilities to effectively select alliance partners and manage alliance conflicts.

In particular, in the context of the U.S. airline industry, airlines may benefit from their previous alliance experience. For example, Continental expected that its upcoming alliance with Northwest would be smooth because of the learning from its previous alliance experience with America West. In an interview about Continental's upcoming alliance formation with Northwest, Mr. Gregory Brenneman, the Continental's president and chief operating officer, said "when we started with America West, we were earning our bachelor's degrees…Today, we have our Ph.D.s" (McCartney, 1998, p. B.1).

In sum, we believe that firms with more general alliance experience have higher alliance management capabilities and are thus more effective in managing complex alliance relationships to deliver quality services. Specifically, in this paper, we examine the moderating effects of alliance experience on the relationship between alliance portfolio size and customer service quality and the relationship between multilateral alliance ratio and customer service quality. Thus, we further hypothesize

H1a: as alliance experience increases, the relationship between alliance portfolio size and customer service quality becomes more positive (or less negative).

H1b: as alliance experience increases, the relationship between multilateral alliance ratio and customer service quality becomes more positive (or less negative).

3. RESEARCH METHOD

Data Collection

Sample

Using longitudinal data over a 20-year period between 1988 and 2007, this paper relied on a sample of nine U.S. major airlines, which include American Airlines, America West, Alaska, Continental, Delta, Southwest, Northwest, United Airlines and U.S. Airways. According to DOT's definition, an airline is classified as major if it has at least one percent of total U.S. domestic passenger revenues. These nine major airlines were selected because their data are most continuously available throughout the 20-year period under investigation except for America West that was acquired by U.S. Airways in 2006. Also, other researchers have used these nine airlines in their longitudinal studies related to customer service (e.g., Lapre & Tsikriktsis, 2006; Luo, 2007).

The alliance data were collected from Securities Data Company (SDC) database. To test the temporal effects of alliance formation on service quality, the service quality data were collected with a three-month lag after the alliance data from reports published by the U.S. Department of Transportation (DOT).

The U.S. airline industry provides a natural setting for this study for several important reasons. First, airlines have enthusiastically sought an impressive number of and different forms of alliances, which differ greatly along the value chain, such as alliances with hotels, car rental companies and other airlines. Second, the U.S. airline industry provides rich archival longitudinal data sources that make this study possible. Third, since the major U.S. airlines are at least dominant-business firms (Rumelt, 1974), the confounding effects of diversified corporate effects on the customer service quality are less likely to be a concern because an airline's revenues come primarily from the passenger transportation business (Chen & Hambrick, 1995).

The timeframe between 1988 and 2007 was chosen for two reasons. First, only after 1988 the data pertaining to the two dimensions of customer service quality are consistently available from DOT's air travel consumer reports. Beginning October, 1987, DOT required major airlines to report their monthly statistics of on-time arrival and consumer complaints. Second, the SDC database, the source from which the alliance data were collected, provides consistent and reliable alliance formation information only after 1988 (Sampson, 2007).

Measures

Dependent variable

On-time arrival and consumer complaints are two widely used service quality

dimensions to study airline services. For example, the popular Airline Quality Ratings (AQR) created by Brent Bowen and Dean Headley in 1991 also uses the two dimensions as part of their measure of airline customer service quality. Bowen and Headley (1991) argued that different from the SERVQUAL approach that relies on customers' subjective evaluation of the airline services, these two dimensions of airline customer service quality provide consistent, comparable and objective data, thus, offering advantages over "soft" survey data in conducting longitudinal analyses.

To study the temporal effects, quarterly service data were collected with a three-month lag after alliance data. The three-month lag was chosen because recently Lapre and Tsikriktsis (2006) used a three-month lag to study how the U.S. airlines improve customer satisfaction, also using the data published in the DOT air travel consumer reports.

Consumer complaints

This statistic is the quarterly average number of complaints per 100,000 passengers. Passengers could file complaints directly with DOT by mail, phone, or in person. The DOT consumer complaint report covers a wide range of service quality issues in 12 categories, including flight problems (such as cancellations, delays), oversales, reservations, ticketing, boarding, fares, refunds, baggage, customer service, disability, advertising, discrimination, animals and others. Where quarterly data were not available, the quarterly average was calculated based on monthly data.

On-time arrival

This statistic is the percentage of flights that arrive on time. According to DOT, a flight is "on time" if it arrives less than 15 minutes after the scheduled time shown in the carriers' Computerized Reservations Systems (CRS). In fulfilling DOT's data reporting requirements, the reporting airlines are required to use automated and/or manual systems for collecting flight data. The data of quarterly rate of on-time arrivals were available and collected.

Bowen and Headley (1991) noted that these two dimensions are a valid proxy measure of the latent customer service quality construct, but differ in their relationships to customer service quality. The number of customer complaints per 100,000 passengers is negatively related to service quality, while on-time arrival rate is positively related to service quality.

Independent and moderating variables

The data pertaining to alliance variables were collected from Securities Data Company (SDC) database, a database widely used in alliance research (e.g., Oxley & Sampson, 2004; Reuer & Ragozzino, 2006; Sampson, 2007) and is one of the most comprehensive sources of information on alliances (Anand & Khanna, 2000). SDC collects the alliance formation announcements and updates the alliance status daily based on popular media publications such as

SEC filings, trade publications, and newswire sources. SDC provides comprehensive alliance details, such as contract type, nationality of the partner, SIC code of the alliance partners, name of each partners, description of the industry of the partners, synopsis of the alliance activities, and alliance status (i.e., terminated, renegotiated, extended, expired, completed). Also, Anand and Khanna (2000) noted that the SDC alliance information is highly reliable and consistent with other sources. For example, they found that SDC's alliance SIC codes accurate and consistent with LexisNexis database. Although there have been some concerns about SDC's accuracy of announcement dates, Anand and Khanna (2000) found that in most cases, the discrepancy of SDC reported dates is within a few days, or at most one or two months, after they verified SDC announcement dates with various news sources, (e.g., news and wire reports, newspapers, magazines and trade journals). Since this study examines the quarterly alliance effects instead of monthly, the date discrepancy is not a serious issue for this paper.

Alliance portfolio size

The alliance portfolio size variable was operationalized as the logarithm of the cumulative number of alliances each airline has each quarter. When an alliance formation announcement is made and its alliance status is "completed and signed," the alliance was added to the alliance portfolio. When the alliance status indicates subsequently "expired or terminated," that alliance was counted off the airline's alliance portfolio size accordingly. For example, when British Airways and American Airlines terminated their alliance in November 1998, that alliance was subtracted from American Airlines' alliance portfolio size in the fourth quarter of 1998.

Multilateral alliance

Following Gulati and Singh (1998), an alliance was coded as a multilateral alliance if the alliance involves more than two partners. An alliance was coded as a bilateral alliance if it involves only two partners. Multilateral alliance ratio was calculated as the number of existing multilateral alliances divided by alliance portfolio size.

Alliance experience

Some researchers have used the number count of prior alliance relationships to measure alliance experience (e.g., Hoang & Rothaermel, 2005; Zollo et al., 2002). Yet, that approach overlooks the learning effects of alliance duration of each alliance. Therefore, we followed Rothaermel and Deeds (2006) to measure general alliance experience as an airline's cumulative durations of each alliance and calculated the alliance experience variable on an annual basis. For example, if an airline has two alliances up to the year of analysis, among which two alliances have lasted 2 years, one 10 years, and another 12 years, then the alliance experience score is calculated as 2*2+1*10+1*12=26.

Moderating variables

Alliance portfolio size*alliance experience and multilateral alliance ratio* alliance experience are the interaction terms to examine the hypothesized moderation effects of alliance experience. Following recommendations by

Cohen, Cohen, West and Aiken (2003), each independent variable was mean centered before they were entered into the models. To check multicollinearity, we conducted post regression analyses and found that all VIFs were below 10, suggesting that multicollinearity was not a severe problem for these interaction terms (Hair, Anderson, Tatham, & Hair 1998).

Control variables

To control for the alternative explanations of the variances in the dependent variables, this study includes two control variables that are firm size, airline type, temporal control for September 11th, 2001, and repeat alliances.

Firm size

Since larger airlines may have higher management complexity (Lapre & Tsikriktsis, 2006) and form more alliances, we used the logarithm of quarterly average number of employees as the proxy for firm size. Quarterly employee data from 1990 to 2007 were obtained directly from the DOT office. Because only annual employee data between 1988 and 1989 were available from DOT's Airline Employment Data reports, quarterly data were interpolated for these two years.

Airline type

Airlines can be classified into either focused or full-service airlines. Lapre and Tsikriktsis (2006) argued that focused airlines may learn faster than full-service airlines to achieve higher level of customer satisfaction, because focused airlines have a simplified operation, thus facilitating their coordination. Following Lapre and Tsikriktsis (2006), Alaska, America West, and Southwest were coded focused airlines because they focus on operations in North America only. American Airlines, Continental, Delta, Northwest, United Airlines and US Airways were coded full-service airlines because they operate both continental and intercontinental routes.

Terrorist attack on September 11th, 2001

The third control is a dummy variable that controls for the effects of the terrorist attack on September 11th, 2001. Rhoades and Waguespack (2004) compared the U.S. airline service quality between 1987 and 2002, and found that airline service quality improved in terms of on-time arrival, and reduced both and customer complaints after the terrorist attack in 2001. They explained this improvement due to decreased passenger volume and consumers' lower propensity to complain as a result of their heightened concern over safety issues.

Repeat alliance

We also control for repeat alliances, because alliance with the same partner may suggest lower alliance management risks due to higher interfirm trust and more effective relation-specific routines of coordinating resources (Sampson,

2007). This variable was measured as the number of existing alliances in an alliance portfolio that involves at least one previous partner.

A total of 351 alliance announcements were obtained from SDC databases. To match the service quality data with the alliance data, we applied the three-month data lag as described earlier. Six hundred one observations (firm-quarter data entries) were coded for the nine airlines over the 20-year period. Table 1 provides the summary statistics and variable correlations. we conducted the Variance Inflation Factor (VIF) analyses of all the independent and moderating variables and found all the VIF values were below 10. This suggests that multicollinearity is not a severe issue in this study (Hair et al., 1998).

Hypotheses Testing

To test the hypotheses, we used random effects panel data regression (also known as random effects cross-sectional time series regressions) in Stata 10 (xtreg procedure). Random effects regressions relax the assumption that firm specific effects are correlated with the predictors in the model (Greene, 2003). We chose this analysis procedure because the Hausman's test results of the models did not suggest that fixed effects regressions are more efficient (Greene, 2003; Wooldridge, 2002).

Table 1 provides descriptive statistics of all the variables. Tables 2-3 provide test results of the hypotheses. Each hypothesis was separately tested on customer complaints and on-time arrival in a hierarchical regression. First, models 1 and 3 are the baseline models with the control variables only. In models 2 and 4, the interaction terms were entered to test the hypotheses.

Hypothesis 1a: Interaction between alliance portfolio size and alliance experience

H1a predicted that alliance experience moderates the effects of alliance portfolio size on service quality such that as alliance experience increases, the relationship between alliance portfolio size and service quality becomes less negative or more positive. Table 2 presents the analyses to test hypothesis 1a.

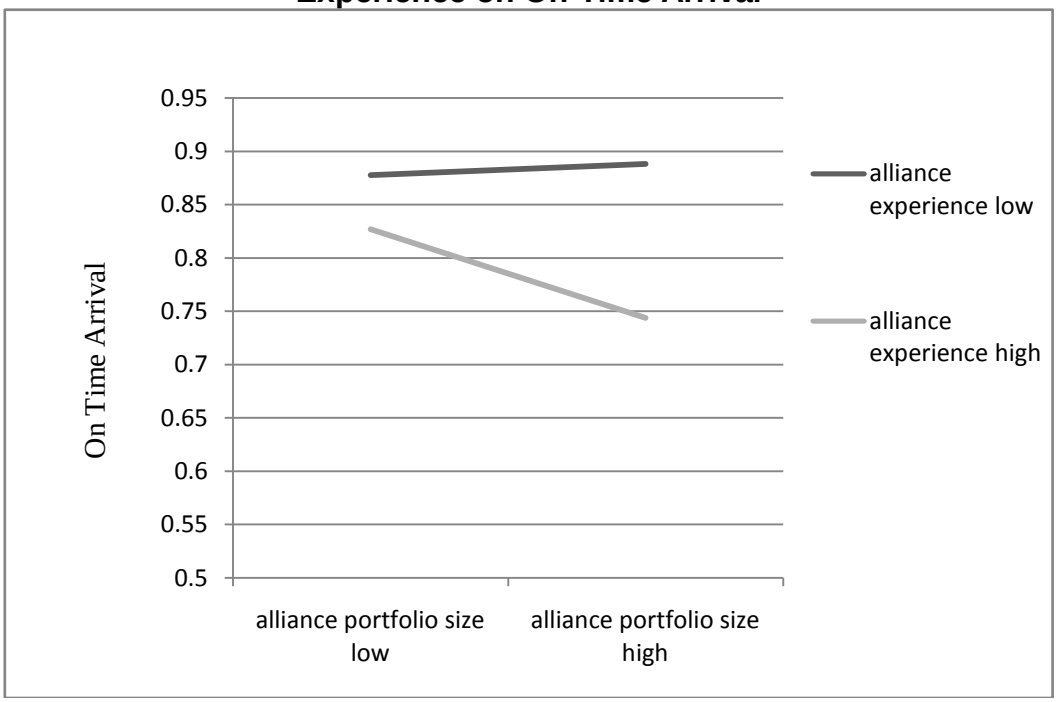
Table 1: Variable Means, Standard Deviations, and Intercorrelations													
		Mean	**SD**	1	2	3	4	5	6	7	8	9	10
1	Customer complaint $_{it1}$	1.272	1.087										
2	On-time arrival$_{it1}$	0.78	0.055	-0.386***									
3	Alliance portfolio size $_{it0}$ (log)	2.469	1.183	0.115***	-0.155*								
4	Multilateral alliance ratio $_{it0}$	0.175	0.163	-0.084**	-0.008	0.035							
5	Alliance experience $_{it0}$	111.085	142.572	0.018	-0.146*	0.768***	0.079*						
6	Alliance portfolio size $_{it0}$ (log)* Alliance experience $_{it0}$	96.358	135.065	-0.111***	0.0282	-0.063	0.279*	0.431***					
7	Multilateral alliance ratio $_{it0}$* Alliance experience $_{it0}$	-0.915	17.636	0.044	-0.0657	0.132***	-0.678***	-.000	-0.301***				
8	Firm size$_{it1}$ (log)	10.578	0.716	0.049	0.108*	0.364*	0.117***	0.277***	0.284***	-0.004			
9	Airline type	0.739	0.44	0.094**	0.041	0.378***	0.226***	0.335***	0.339***	-0.036	0.820***		
10	Repeat alliance$_{it0}$	4.656	6.498	0.023	-0.097*	0.731***	0.133***	0.866***	0.286***	-0.031	0.342***	0.341***	
11	September 11th, 2001	0.338	0.474	-0.220***	0.023	0.509***	0.004	0.644***	0.236***	0.020	-0.123***	-0.081*	0.438***

Table 2: Hypothesis 1a, DVs-Customer Complaint and Mishandled Baggage

	Model 1 Customer complaint$_{it1}$	Model 2 Customer complaint$_{it1}$	Model 3 On-time arrival$_{it1}$	Model 4 On-time arrival$_{it1}$
Control variables				
Airline type	0.135	-0.212	-0.059**	-0.019
	(0.224)	(0.285)	(0.025)	(0.029)
Firm size $_{it1}$ (log)	-0.288**	-0.190	0.073***	0.064***
	(0.140)	(0.172)	(0.012)	(0.014)
September 11th, 2001	-0.992***	-1.189***	0.045***	0.073***
	(0.113)	(0.142)	(0.006)	(0.008)
No. of repeat alliance$_{it1}$	0.011	0.008	-0.001	0.001
	(0.011)	(0.019)	(0.001)	(0.001)
Independent variables			-0.022***	-0.037***
Alliance portfolio size $_{it0}$ (log)	0.322***	0.415***	(0.003)	(0.006)
	(0.0571)	(0.104)		
Alliance experience $_{it0}$		0.000		-0.000
		(0.001)		(0.000)
Alliance portfolio size $_{it0}$ (log)* Alliance experience $_{it0}$		0.001		-0.000***
		(0.001)		(0.000)
Constant	3.705***	2.661	0.092	0.198
	(1.345)	(1.629)	(0.12)	(0.13)
Overall R^2	0.145	0.1309	0.126	0.134
Chi square	88.80***	90.88***	122.31***	135.84***
F-value for change in R^2		-9.279		5.682**

*** p < 0.01, ** p < 0.05, * p < 0.1
Standard errors in parentheses
No. of observations = 601

Figure 2: Interaction Effect of Alliance Portfolio Size and Alliance Experience on On-Time Arrival



Customer complaint

The results of model 2 indicate that both the overall model (R^2 = 0.145, Chi square = 88.80, p > 0.01) and the incremental change in R square (F = 14.569, p < 0. 01) were significant after the alliance portfolio size*alliance experience was entered. Yet, the interaction term, alliance portfolio size* alliance experience (beta = -0.001, p > 0.10), was not significantly related to customer complaint, lending no support to H1a.

On-time arrival

The results of model 4 indicate the overall model (R^2 = 0.134, Chi square = 135.84, p < 0.01) and the incremental change in R square (F = 5.682, p < 0.05) were significant after alliance portfolio size *alliance experience was entered. The interaction term, alliance portfolio size *alliance experience (beta = -0.000, p < 0.01) was significantly negatively related to on-time arrival. Figure 3 plots the interaction and suggests that when alliance experience is low, the larger an airline's alliance portfolio size, the higher on-time arrival. But when alliance experience is high, increases in alliance portfolio size are associated with lower on-time arrival rate. This is inconsistent with H1a prediction.

Table 3: Hypothesis 1b, DVs-Customer Complaint and On-Time Arrival

	Model 1 Customer complaint$_{it1}$	Model 2 Customer complaint$_{it1}$	Model 3 On-time arrival$_{it1}$	Model 4 On-time arrival$_{it1}$
Control variables				
Airline type	-0.233	-0.535*	0.077***	0.097***
	(0.249)	(0.280)	(0.014)	(0.016)
Firm size $_{it1}$ (log)	0.083	0.155	0.002	-0.002
	(0.120)	(0.123)	(0.007)	(0.007)
September 11th, 2001	-0.868***	-0.857***	0.048***	0.047***
	(0.141)	(0.140)	(0.008)	(0.008)
No. of repeat alliance$_{it1}$	-0.036***	-0.041***	0.003***	0.003***
	(0.012)	(0.013)	(0.001)	(0.001)
Independent variables				
Alliance portfolio size $_{it0}$ (log)	0.197***	0.229***	-0.007**	-0.010***
	(0.056)	(0.058)	(0.003)	(0.003)
Alliance experience $_{it0}$	0.002***	0.002***	-0.000***	-0.000***
	(0.001)	(0.001)	(0.000)	(0.000)
Multilateral alliance ratio $_{it0}$	-0.524*	-1.441***	0.043***	0.104***
	(0.268)	(0.481)	(0.015)	(0.027)
Multilateral alliance ratio $_{it0}$* Alliance experience $_{it0}$		-0.009**		0.001***
		(0.003)		(0.000)
Constant	0.402	0.019	0.693***	0.719***
	(1.103)	(1.111)	(0.063)	(0.063)
Overall R^2	0.129	0.138	0.183	0.195
Chi square	72.13***	78.03***	108.92***	117.52***
F-value for change in R^2		5.245**		7.182***

*** p < 0.01, ** p < 0.05, * p < 0.1
Standard errors in parentheses
No. of observations = 495

Figure 3: Interaction Effect of Multilateral Alliance Ratio and Alliance Experience on Customer Complaint

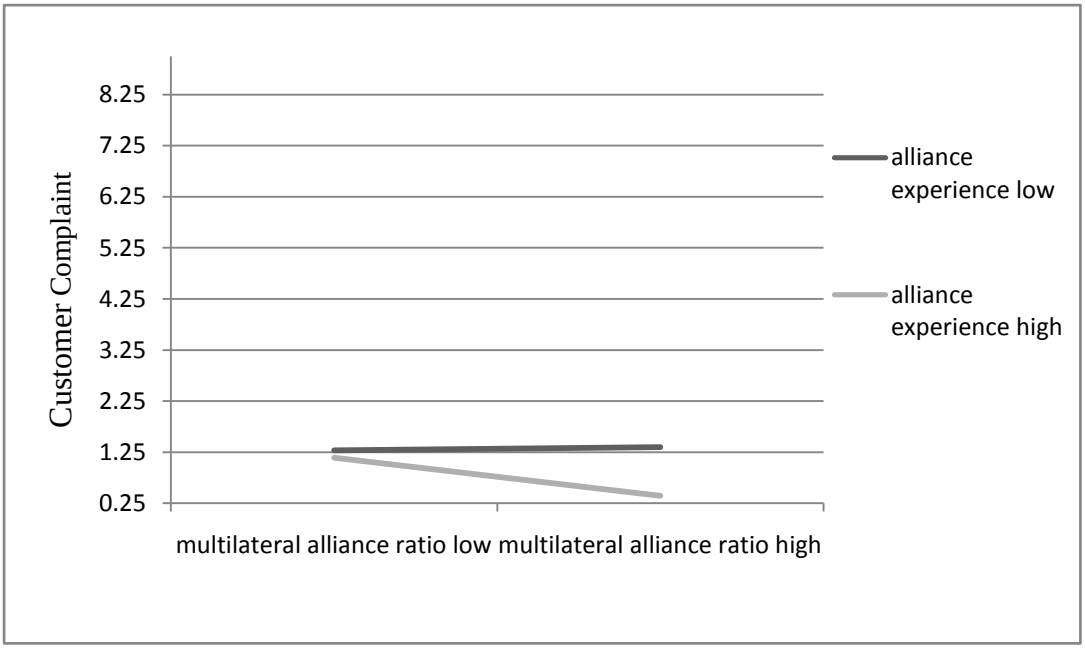
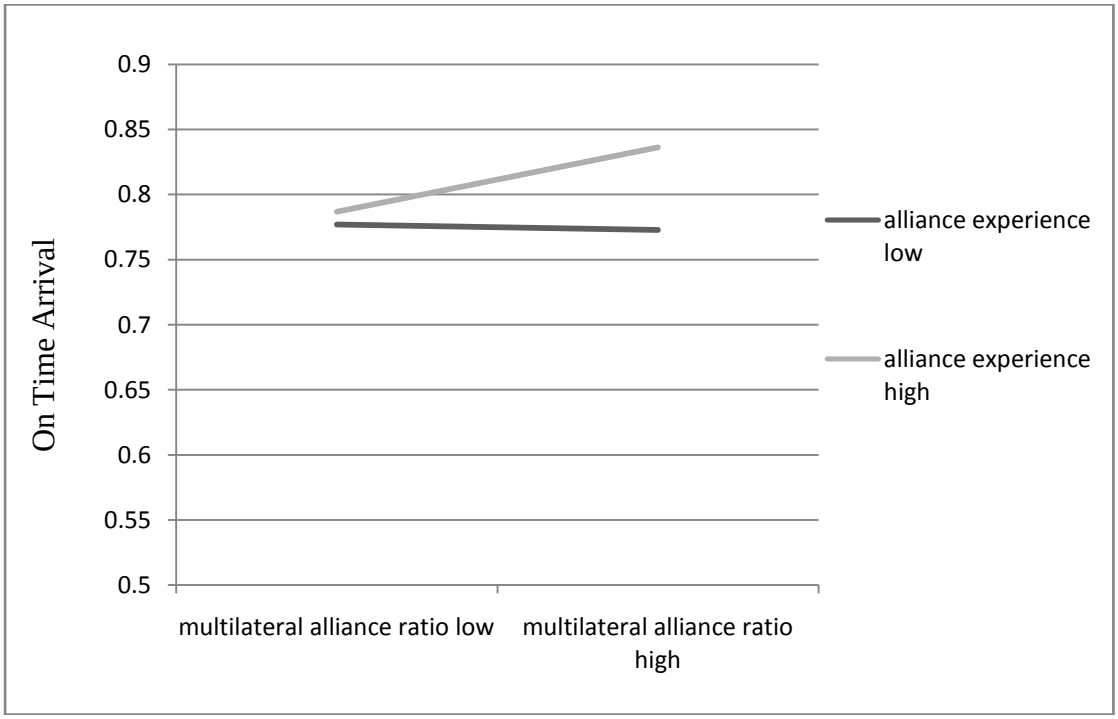


Figure 4: Interaction Effect of Multilateral Alliance Ratio and Alliance Experience on On-Time Arrival



Hypothesis 1b: Interaction between multilateral alliance ratio and alliance experience

H1b predicted that alliance experience enhances the relationship between multilateral alliance ratio and customer service quality. America West and Southwest were removed from the sample because these two airlines were not reported to have any multilateral alliances. The resultant number of observations is 495. Tables 3 present the analyses to test hypothesis 1b.

Customer complaint

The results of model 2 show that both the overall model (R^2 = 0.138, Chi square = 78.03, $p > 0.01$), and the incremental change in R square ($F = 5.245$ $p < 0.05$) were significant after multilateral alliance ratio*alliance experience was entered. Multilateral alliance ratio*alliance experience (beta = -0.009, $p < 0.05$) was negatively related to customer complaint. The interaction plot is presented in Figure 3 and suggests that when alliance experience is high, as multilateral alliance ratio increases, customer complaint ratio decreases, thus lending support to H1b.

On-time arrival

The results of model 4 indicate that both the overall model (R^2 = 0.195, Chi square = 117.52, $p < 0.01$) and the incremental change in R square ($F = 7.182$, $p < 0.01$) were significant after multilateral alliance ratio* alliance experience was entered. Alliance portfolio size * alliance experience (beta = 0.001, $p < 0.01$) was significantly positively related to on-time arrival. The interaction plot presented in Figure 4 suggests that alliance experience positively moderates the relationship between multilateral alliance ratio and on-time arrival such that as multilateral alliance ratio increases, the higher alliance experience, the higher on-time arrival rate. On the other hand, under the low alliance experience condition, as a multilateral alliance ratio increases, on-time arrival is associated with a slight decrease. This finding is consistent with H1b.

4. DISCUSSION

H1a predicted that alliance experience positively improves the relationship between alliance portfolio size and customer service quality. The results did not support H1a on any of the two dimensions. H1b predicted that alliance experience positively moderates the relationship between multilateral alliance ratio and customer service quality. The results show that alliance experience improved the effects of multilateral alliance ratio on customer complaints and on-time arrival. This finding indicates that the benefits of alliance experiences are contingent upon the specific dimension of service quality.

Since H1a was not supported, alliance experience is only a necessary but not a sufficient means to effectively manage alliances. Airline managers should seek other more active means to manage alliances, such as setting up a dedicated function to coordinate alliance activities in order to enhance alliance

performance (Kale, Dyer & Singh, 2002)

There are several limitations of this paper. First, due to data unavailability, we did not control for the effects of dedicated alliance functions. Kale et al. (2002) argued that alliance experience is a crude proxy for alliance management capability. They found that firms with a dedicated alliance function had better performance. Future studies may investigate the effects of a dedicated alliance function on service quality.

Second, researchers may conduct qualitative studies to help understand the findings of this paper. This paper is built on the theoretical premise of managers' bounded rationality (March & Simon, 1958). The bounded rationality argument presupposes that the alliance participation dampens the various alliance benefits. Future research may include qualitative studies such as interviews with airline managers to better understand the inner workings of alliance relationships.

Third, future research may use different regression procedures and time lags to validate the results reported in this paper. This paper used random panel regressions to test the hypotheses. Future research may use difference in difference regressions to detect the differential effects of alliances on service quality to corroborate the results reported in this paper. Also, future research may use different time lags such as 6 months or 12 months to compare the results because it is possible that under certain circumstances, the time lag of 3 months may not be long enough for the alliance effects to show on service quality.

Fourth, since this paper relied on data from a single, unique industry, future research should cross-validate the results of this paper in other industries. For example, using data from ACSI and SDC databases is a viable approach.

5. CONCLUSION

This paper seeks to investigate the moderating effects of alliance experience on enhancing customer service quality. In the context of the U.S. airline industry, managers are constantly pressured to enhance revenues and contain costs. Participating in alliance becomes an attractive strategy because alliances allow airlines to obtain benefits that are hard to obtain on their own. Yet, alliances are a complex organizational form that involves managing independent partners to accomplish interdependent alliance tasks, demanding substantial time and effort of the boundedly rational managers. Alliance experience helps to improve only certain aspects of service quality. Yet, more active measures need to be taken to ensure service quality.

6. REFERENCES

Anand, B. N., & Khanna, T. 2000. “Do firms learn to create value? The case of alliances”. *Strategic Management Journal, 21*(3), 295-315.

Barringer, B. R., & Harrison, J. S. 2000. “Walking a tightrope: Creating value through interorganizational relationships”. *Journal of Management*, *26*(3), 367-403.

Bourdeau, B. L., Cronin, J. J., & Voorhees, C. M. 2007. “Modeling service alliances: An exploratory investigation of spillover effects in service partnerships”. *Strategic Management Journal, 28*(6), 609-622.

Bowen, B. D., & Headley, D. E. 1991. “*Airline quality rating”*. National Institute for Aviation Research Report.

Chen, M. J., & Hambrick, D. C. 1995. Speed, stealth, and selective attack: How small firms differ from large firms in competitive. *Academy of Management Journal*, *38*(2), 453-482.

Cohen, P., Cohen, J., West, S. G., & Aiken, L. S. 2003. *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). New Jersey: Lawrence Erlbaum Associates.

Cohen, W. M., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, *35*(1), 128-152.

Cook, T. D., & Campbell, D. T. 1979. *Quasi-experimentation: Design and analysis issues for field settings*. Boston: Houghton Mifflin.

Das, T. K., & Teng, B. S. 1998. “Between trust and control: Developing confidence in partner cooperation in alliances”. *Academy of Management Review, 23*(3), 491-512.

Das, T. K., & Teng, B. S. 2001. “A risk perception model of alliance structuring”. *Journal of International Management, 7*(1), 1-29.

Das, T. K., & Teng, B. S. 2002. “Alliance constellations: A social exchange perspective”. *Academy of Management review, 27*(3), 445-456.

Greene, W. H. 2003. *Econometric analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. 1998. *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Hoang, H. A., & Rothaermel, F. T. (2005). The effect of general and partner-specific alliance experience on joint R & D project performance. *Academy of Management Journal, 48*(2), 332-345.

Hoffmann, W. H. 2007. “Strategies for managing a portfolio of alliances”. *Strategic Management Journal, 28*(8), 827-856.

Hwang, P., & Burgers, W. P. 1997. “The many faces of multi-firm alliances: Lessons for managers”. *California Management Review, 39*(3), 101-117.

Inkpen, A. C. 2001. “Strategic alliances”. In M. A. Hitt, R. E. Freeman, & J. S. Harrison (Eds.), *The Blackwell handbook of strategic management*. Malden, MA: Blackwell.

Ireland, D., Hitt, M. A., & Vaidyanath, D. 2002.” Alliance management as a source of competitive advantage”. *Journal of Management, 28*(3), 413-446.

Jarrilo, J. C. 1988. “On strategic networks”. *Strategic Management Journal, 9*(1), 31-41.

Kale, P., Dyer, J. H., & Singh, H. 2002. “Alliance capability, stock market

response, and long-term alliance success: The role of the alliance function". *Strategic Management Journal, 23*(8), 747-767.
Kleymann, B., & Seristö, H. 2004. *Managing strategic airline alliances*. Aldershot, Hampshire: Ashgate Publishing.
Lapre, M. A. & Tsikriktsis, N. 2006. "Organizational learning curves for customer dissatisfaction: Heterogeneity across airlines". *Management Science, 52*(3), 352-366.
Lazzarini, S. G. 2007. "The impact of membership in competing alliance constellations: Evidence on the operational performance of global airlines". *Strategic Management Journal, 28*(4), 345-367.
Luo, X. 2007. "Consumer negative voice and firm-idiosyncratic stock returns". *Journal of Marketing, 71*(3), 75-88.
March, J. G., & Simon, H. A. 1958. *Organizations.* New York: Wiley.
McCartney, S. 1998. "Airlines: Airline alliances take toll on travelers", *The Wall Street Journal*, p. B.1.
Oxley, J. E., & Sampson, R. C. 2004. "The scope and governance of international R & D alliances". *Strategic Management Journal, 25*(8-9), 723-749.
Parasuraman, A., Zeithaml, V. A., & Berry, L. L. 1988. "SERVQUAL: A multi-item scale for measuring consumer perceptions of service quality". *Journal of Retailing, 64*(1), 12-40.
Reuer, J. J., Zollo, M., & Singh, H. 2002. "Post-formation dynamics in strategic alliances". *Strategic Management Journal, 23*(2), 135-151.
Reuer, J. J., & Ragozzino, R. 2006. "Agency hazards and alliance portfolios". *Strategic Management Journal, 27*(1), 27-43.
Rhoades, D. L., & Lush, H. 1997. "A typology of strategic alliances in the airline industry: Propositions for stability and duration". *Journal of Air Transport Management, 3*(3), 109-114.
Rhoades, D. L., & Waguespack, B. 2004. "Service and safety quality in US airlines: Pre-and post-September 11th". *Managing Service Quality, 14*(4), 307-316.
Rothaermel, F. T., & Deeds, D. L. 2006. "Alliance type, alliance experience and alliance management capability in high-technology ventures". *Journal of Business Venturing, 21*(4), 429-460.
Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review 23*(3), 393-404.
Rumelt, R. 1974. *Strategy, structure and profitability*. Boston, MA: Harvard Business School Press.
Sampson, R. C. 2007. "R & D alliances and firm performance: The impact of technological diversity and alliance organization on innovation". *Academy of Management Journal, 50*(2), 364-386.
Simonin, B. L. 1997. "The importance of collaborative know-how: An empirical test of the learning organization". *Academy of Management Journal, 40*(5), 1150-1174.
Tsantoulis, M., & Palmer, A. 2008. "Quality convergence in airline co-brand alliances". *Managing Service Quality, 18*(1), 34-64.
Weber, K., & Sparks, B. 2004. "Consumer attributions and behavioral responses to service failures in strategic airline alliance settings". *Journal of Air Transport Management, 10*(5), 361-367.

White, S., & Lui, S. S.-Y. 2005. “Distinguishing costs of cooperation and control in alliances”. *Strategic Management Journal, 26*(10), 913-932.
Williams, G. 2001. “Will Europe's charter carriers be replaced by no-frills scheduled airlines?”*Journal of Air Transport Management, 7*(5), 277-286.
Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. London, England: MIT Press.
Zeithaml, V. A. 2000. Service quality, profitability, and the economic worth of customers: What we know and what we need to learn. *Journal of the Academy of Marketing Science, 28*(1), 67-85.
Zeng, M., & Chen, X.-P. 2003. Achieving cooperation in multiparty alliances: A social dilemma approach to partnership management. *Academy of Management Review, 28*(4), 587-609.
Zollo, M., Reuer, J. J., & Singh, H. 2002. Interorganizational routines and performance in strategic alliance. *Organization Science, 13*(6), 701-713.