Journal of Air Transport Management 55 (2016) 92–101

Contents lists available at ScienceDirect

Journal of Air Transport Management

journal homepage: www.elsevier.com/locate/jairtraman

Collaborating pivotal suppliers: Complementarities, flexibility, and standard communication between airline companies and travel agencies

Chien Chi Yeh [a], Edward C.S. Ku [b, *], Ching Hua Ho [a]

[a] Graduate Institute of Travel and Tourism Management, National Kaohsiung University of Hospitality and Tourism, No.1, Songhe Rd., Xiaogang Dist., Kaohsiung City 81271, Taiwan, ROC
[b] Department of Travel Management, National Kaohsiung University of Hospitality and Tourism, No.1, Songhe Rd., Xiaogang Dist., Kaohsiung City 81271, Taiwan, ROC

ARTICLE INFO

Article history:
Received 20 June 2015
Received in revised form
5 May 2016
Accepted 5 May 2016

Keywords:
Collaborating suppliers
Complementarities
Flexibility
Travel agencies

ABSTRACT

One of the main aims of travel agencies is to collaborate with airline companies in designing tourism products connectivity and timetable coordination. The objective of this study was to investigate how strategic collaboration between airline companies and travel agencies affects collaborative performance, particularly in terms of delivery quality and complementarities with supplier competencies.

Data were obtained via questionnaire surveys that were distributed among employees of travel agencies from Taiwan, Mainland China, Hong Kong and Singapore. The model and the hypotheses were tested using structural equation modeling. The findings of this study indicate that higher delivery quality from airline companies improves a travel agency's ability to develop and operate more effectively. Complementarities with supplier competencies across the airline companies and travel agencies facilitate the development of knowledge competence particularly in relation to price strategy. In addition, supply chain flexibility significantly influences collaborative performance within travel agency collaborations.

1. Introduction

Flight tickets are one of the decisive travel products (Christiaanse and Venkatraman, 2002; Law et al., 2010); thus, collaborating with the airline companies in designing travel product connectivity and timetable coordination has been the strategic aim of travel agencies (Castillo-Manzano and López-Valpuesta, 2010; Christiaanse and Venkatraman, 2002; Granados et al., 2012a,b; Koo et al., 2011; Pearson et al., 2015). Moreover, Internet advances have boosted both the number of travel cyber intermediaries and the business models of airline companies and travel agencies (Daft and Albersb, 2015; Koo et al., 2011; Wei and Ozok, 2005), which in turn have enabled an increased online transparency of travel suppliers' products and prices. Previous studies have argued that travelers look for lower ticket prices on the Internet, and while their concern with journey complexity results in comparing prices from different airline companies online (Christiaanse and Venkatraman, 2002; Koo et al., 2011; Zhang and Morrison, 2007), they still order tour packages from travel agencies.

At a strategic level, travel agencies should pursue for sustainable improvements in product quality and innovation, enhanced competitiveness, and increased market share with collaborating partners. However, there are specific gaps in the literature, concerns airline and travel agency relations. Although most topics recognize collaborating among travel agencies (Castillo-Manzano and López-Valpuesta, 2010; Huang, 2006; Zhang and Morrison, 2007), and between travel agencies and hotel (Karande and Magnini, 2011; Ku et al., 2011; Medina-Munoz et al., 2002; Wong and Kwan, 2001), few studies have explored the alliance between airline companies and travel agencies. Second, although most companies recognize that flexibility is a key to collaborating performance, many have not yet analyzed the role of complementarities as a driver of supply flexibility. Third, the specific gaps in the literature regarding delivery quality and standard communication with partner competencies from the perspective of resource-based

* Corresponding author.
E-mail addresses: angelskyyeh@gmail.com (C.C. Yeh), edwardku@mail.nkuht.edu.tw (E.C.S. Ku), chh436@mail.nkuht.edu.tw (C.H. Ho).

http://dx.doi.org/10.1016/j.jairtraman.2016.05.004
0969-6997/

have not been comprehensively examined. Therefore, study aims to elucidate how supply chain factors affect alliance performance with partners based on Structure-Conduct-Performance (SCP) perspective.

The SCP perspective contextualizes collaborating strategies as responses to structural changes in the relevant market; facing with tourism market changes rapidly, delivery quality from airline companies is about travel products being readily available as requested (Vanpoucke et al., 2009). From the perspective of travel collaborating, the primary purpose of establishing the tourism supply chain design is really a mix of many factors: securing tourism products supply form suppliers (Kim, 2006; Noshad and Awasthi, 2015), involving suppliers of supply chain in tourism product development (Khan et al., 2012; Kim, 2006), and achieving both cost minimization and fast response to market changes; collaborating pivotal airline companies play a crucial role in shaping strategies.

Furthermore, resource sharing takes place when two or more organizations in a network combine their complementary assets, resulting in a unique combination of assets that help companies tap market opportunities, leading to competitive advantage. Travel agencies provide travelers with information about tourist products and services that they distribute, and airline companies employ strategic collaboration to increase their competitiveness in service quality, innovation, and cost (Baron and Harris, 2010; Skipper et al., 2009) due to the ever changing business environment; however, few studies have examined how delivery quality and complementarities with partner competencies affect strategic alliances between airlines and travel agencies.

Supply chain flexibility occurs as a strategic result of investments over years. Traditionally, airline tickets are handled by travel agencies, which is used global distribution systems that provide coordination to obtain accurate information on the status of flights, prices, and other services. For suppliers, greater interoperability means potentially greater coverage across channels and opportunities for enhanced control (Gosain et al., 2004; Khan et al., 2012; Vachon et al., 2009). However, flexibility of supply chain, and the management overhead associated with using multiple channels mean that choices must be made between alternative solutions between travel agencies and airline companies.

Strategic collaborating involve formal or informal agreements between two or more companies (Kalligiannis et al., 2006; Tsantoulis and Palmer, 2008), and the growth of strategic collaborating within the airline companies and travel agencies has been witnessed through information technology; travel electronic distribution systems are in a state of transition as a result of technological advancements, new and emerging players, and a shift in the balance of power among suppliers, buyers, and intermediaries (Lazzarini, 2007; Lunnan and Haugland, 2008; Morgan, 2012; Wymbs, 2000). That is, the travel collaborating structure evolves as a firm develops supply chain relationships and transacts with its suppliers; accordingly, service standards communication of travel becomes a key factor within the supply chain relationship.

Collaboration is an activity that brings planning suppliers together for information sharing, discussion, and consensus. Supply chain suppliers take advantage of multiple strengths to address both shared and individual weaknesses, thereby increasing the level of organizational flexibility. Previous studies' have argued that regarding cost efficiency, volume flexibility, and delivery speed are also very important when selecting supply chain suppliers (Gosain et al., 2004; Vanpoucke et al., 2009), for collaborating offers the benefits of joint synergy and planning without the risks associated with complete control and ownership. Cooperation is a value that includes the belief that, by working together, outcomes are more effective and acceptable to all concerned. To better understand the above mentioned relationships, flexible capabilities of supply chain and standard communication will be analyzed in the study.

The objective of this study is to investigate how strategic collaborating between airline companies and travel agencies, in terms of delivery quality and complementarities with partner competencies, affects collaborating performance. Data were obtained via questionnaire survey of some travel agencies in Taiwan, Mainland China, Hong Kong, and Singapore. The model and the hypotheses were tested using a structural equation modeling approach. Section 2 describes the theoretical background of this study, provides a review of previous research in the field, and presents the research model. Section 3 describes the research methodology, Section 4 presents the research findings, and Section 5 provides the conclusions of this study.

2. Theoretical background and literature review

2.1. Structure-Conduct-Performance perspective: suppliers as a collaboration's critical resource

The Structure-Conduct-Performance argues that firms derive competitive advantages by responding to the characteristics of the industry in which they compete (Bigné et al., 2008; Ralston et al., 2015; Styles et al., 2008). Firms pursue strategies in response to market conditions, which alter firm and their collaborating partners conduct to positively impact the level of profits earned; the other, firms usually do all the necessary resources and capabilities required to effectively compete in today's marketplace, SCP based theories to specify the conditions under which different firm resources will be valuable.

From SCP perspective, resources were developed to establish the conditions under which firms can gain and sustain a competitive advantage (Kamasak, 2011; Morgan, 2012; Wymbs, 2000). The resource-based view (RBV) states that a related linkage between all parents in a network is more likely to create an environment in which all parties can share critical yet complementary competencies to generate higher financial or operational synergies than would be possible through an unrelated diversification strategy (Baron and Harris, 2010; Pearson et al., 2015; Piccoli and Ives, 2005). Furthermore, firm's capability for internal coordination is a strategic resource that can be leveraged to gain a competitive advantage through an effort that involves suppliers.

SCP framework examines how firms develop strategies to create a fit situation between firm and external environment, and RBV offers an explanation of how competitive advantage is generated in the face of competitive pressures; based on SCP perspectives, airlines companies and travel agencies to collaborate in response to changes in the environment, and thus make the relevant policy (Daft and Albersb, 2015; Kamasak, 2011; Ku et al., 2013), that is, delivery quality and complementarities with supplier competencies between airline and travel agencies in response to the formation of confrontation the most beneficial strategy. In the study, we draw delivery quality and complementarities with supplier competencies are two major drivers toward collaborating performance in the supply chain context.

Traditionally. travel agencies that have historically provided complete and accurate information have reaped the benefits of reliance on cooperation with airline companies and have therefore profited from increased bookings (Christodoulidou et al., 2010; Granados et al., 2012a,b). From the SCP perspective, airline companies that value travel agents' business can do much to gain their trust and thus maximize their investment in global distribution networks (Bigné et al., 2008; Daft and Albersb, 2015); simultaneously, strategic purchasing and supplier development are constructs that could have the potential to contribute to the success of

relationship-marketing efforts.

From the SCP perspective, collaborating with pivotal suppliers can lead to reductions in inventory cost (Tyler et al., 2006) and lead time (Bigné et al., 2008; Lawson et al., 2008), as well as improvements in product/process design, quality of travel product, financial performance, and future relationship prospects (Christodoulidou et al., 2010). In collaborating, firm-level factors, such as dependence and relational norms, are often linked to opportunism and relationship continuance; from SCP perspective, flexibility and services standard communication of airline companies aimed at bringing the travelers better service and value, and companies will obtain greater collaboration performance.

2.2. Delivery quality

Delivery quality is defined as a firm's ability to quickly and completely process variable customer requests as related to their suppliers' products (Kim, 2006; Ho and Zheng, 2004) and involves the level of customer satisfaction, which affects the collaborating performance of a firm. The degree of collaboration includes contact and interaction, overlapping boards and councils, joint programs and written agreements between trading suppliers having equal aims to the product or service delivery, quality, productivity, and consumer satisfaction (Ho and Zheng, 2004; Skipper et al., 2009). Accordingly, by operating in the service business, airline companies have shown more survival instincts than all other industries, resisting the environmental factors such as economic crisis and terrorist attacks, delivery quality of reliable from airline companies will affect tourism products' design and innovation between travel collaborating partners.

From the perspective of travel agencies, flight ticket are unique products when creating innovative travel product mix. In response to the pressure of globalization, increasingly competitive markets, and volatile market dynamics, many travel agencies are searching for ways to add elasticity to their services and create service value. From the perspective of collaborating relationship, delivery quality from airline companies is considered in terms of the products that make their deliveries reliable; travel agencies deliver supplies in a timely manner and products are made readily available as requested result in a unique competitive advantage.

2.3. Supply chain flexibility

Flexibility is defined as the capability of an organization to respond to internal and external changes to gain or maintain a competitive advantage (Chiu et al., 2009; Wei and Ozok, 2005); from SCP perspective, according to supply chain flexibility, firms that considered flexibility from both internal and external viewpoints are more likely to specify the flexible competencies required to achieve the flexible capabilities required for customer satisfaction (Button et al., 2005; Vachon et al., 2009). These competencies are needed by supply chain participants to develop superior responsiveness to meet the challenges of a volatile marketplace and to provide the ability to effectively increase or decrease aggregate production in response to customer demand.

From the perspective of supply chain, in an increasingly globalized marketplace, competition among travel agencies now extends to supply-chain competition (Daft and Albersb, 2015; Tachizawa and Gimenez, 2010). Airline companies will revise their scheduled flights by travel trends, the flexibility to adjust the flights can assist tour package planning for travel agencies, flexibility between airline companies and travel agencies will be able to gain a competitive advantage in the travel market. Previous studies have explored the relationship between the dimensions of supply chain flexibility and company performance (Gosain et al., 2004; Tachizawa and Gimenez, 2010) and emphasized that greater levels of integration with travelers and suppliers positively influence flexibility of collaborating relationship, with evidence showing that higher flexibility of collaborating relationship is reflected by joint commitments, dedicated relationships, and developed collaborating partner relations that may be peculiar to the capabilities and knowledge assets. Accordingly, connections with a pivotal partner create distinctive capabilities for travel agencies to build upon tacit and context-specific knowledge and to respond to market demand flexibility.

Airline companies view travel agencies as an important channel to sell their tickets; likewise, from the perspective of travel agencies, collaborating with airline companies can create combinations of unique skills, knowledge, and joint capabilities. For instance, greater integration intensity is likely to produce product quality improvements through quicker identification and communication of challenges, joint problem-solving efforts, and deeper understanding of the interdependencies among supply chain processes. Therefore, H1 is as follows:

H1: Delivery quality is positively associated with flexibility of supply chain.

2.4. Service standard communication

The service standard communication values the degree to which the organization measures, controls, and communicates the standards of service quality (Ku et al., 2011). Conformity to a set of standards is more likely if those standards are understood by every member in collaborating relationship (Lin and Hsieh, 2006; Lytle and Timmerman, 2006). For example, when airline companies expand continuously, they must determine the travel agencies' service strategy and the strategy that will best maintain competitive advantage of the collaboration.

In addition, collaborating travel agencies have to exhibit a good knowledge of markets, travelers, products and services, methods and processes, competitors, employee skills, and the regulatory environment of information systems. Travel agencies should devise suitable packages for travelers; this involves knowledge of customers and suppliers which is a prerequisite for collaboration and the associated information systems having an increasingly customer-centric focus (Fan and Ku, 2010). From a strategic perspective, standardization of activities results from trust and the success perceived by allying suppliers, and the resulting service standard communication between participating airlines in a collaborating may decrease airlines' operating costs for the future.

Accordingly, the step toward standardization results from continued relations between allying suppliers. The value of delivery quality adaptation will improve the travel agencies' communications and raise service standards; that is, when travel agencies expand continuously, they must determine the delivery quality strategy and the ability that will best maintain the collaborating competitive advantage. This leads to the second hypothesis:

H2: Delivery quality is positively associated with service standard communication of supply chain.

2.5. Complementarities with supplier competencies

Complementarities with supplier competencies is defined as a firm that is able to combine resources and thus gain a competitive advantage over a firm that is unable to do so, and this is viewed as one of the key benefits of strategic collaborating (García et al., 2011;

Narasimhan and Narayanan, 2013). Supplier competencies differentiate supplier firms from others in the competitive market based on their offerings for importing firms. Moreover, supplier resource capabilities influence purchasing firms to evaluate and seek competitive advantage from the supply market (Bianchi and Saleh, 2010; Narasimhan and Narayanan, 2013); From the perspective of supply chain, airline companies provide a unique product to their collaborating travel agencies, travel agencies can be packed this unique product into exclusive tour packages, the complementarities with supplier competencies will enhance their competition (García et al., 2011; Tambe et al., 2012). Successful travel agencies must utilize innovation as the key element of management initiatives and practices; accordingly, complementarities with partner competencies as the organizational management practice to enhance supply chain competition are analogous to the adoption of an innovation.

Previous researchers have argued that collaboration between airline companies and travel agencies should exhibit a good knowledge of markets, travelers, products and services, methods and processes, competitors, employee skills, and the regulatory environment of information systems (García et al., 2011; Sivadas and Dwyer, 2000; Wong and Kwan, 2001). Travel agencies who seek to improve their service performance increasingly engage in collaborative product development with their suppliers. The coordination of resources in planning a collaboration increases organizational responsiveness and flexibility (Narasimhan et al., 2010). This study argues that complementarities with partner competencies will affect flexible capabilities on strategic collaborating. This leads to hypothesis 3:

H3: Complementarities with Supplier competencies are positively associated with supply chain flexibility.

Collaborating adaptation is shaped by the need to collaborate organizational resources with environmental opportunities and threats (Divisekera, 2009; Tambe et al., 2012). From the resource-based perspective, competence is viewed as an important resource for a firm. In their collaboration for the introduction and spread of global distribution and central reservation systems, travel agencies gained the main communication ground through application of information technology with airline companies; similarly, complementarities with partner competencies enable the standard communication with their suppliers. This leads to hypothesis 4:

H4: Complementarities with supplier competencies is positively associated with service standard communication of supply chain.

2.6. Collaborating performance

Strategic collaborating is the extent to which a firm's overall business, product, and technology guide the product development content and processes (Chao et al., 2015; Lunnan and Haugland, 2008). Managers assess performance in terms of their overall satisfaction with the collaborating or in terms of the extent to which a collaboration has met its stated objectives (de Rond and Bouchikhi, 2004; Lazzarini, 2007). By engaging in strategic collaborating, firms can gain the benefits of economies of scale, access to scarce knowledge and skills, and spread the risks of research and innovation.

Previous research stated that collaborating performance has been associated with the process of planning the business strategy; it is a business strategy in each firm to reach high performance, and this strategy emphasizes a specific combination of competitive edges (Kalligiannis et al., 2006; Tsantoulis and Palmer, 2008). Subsequently, flexible supply chains and service standard communication have been recognized as the most essential attributes of successful strategic collaborating. From the buyer's perspective, in addition to engaging with suppliers, a successful relationship is predicated on the selection of suppliers that are also motivated to achieve positive relationship outcomes and positively impact collaborating performance.

Flexible supply chains are able to adapt effectively to disruptions in supply and changes in demand while maintaining customer service levels. Previous research emphasized that flexible supply chains are able to adapt effectively to disruptions in supply and changes in demand while maintaining customer service levels (Divisekera, 2009; Kale et al., 2002; Kale and Singh, 2007; Lazzarini, 2007; Tsantoulis and Palmer, 2008). In this study, it is argued that airline companies and travel agencies are examples of industries that have attempted to implement supply chain flexibility with varying degrees of performance from collaborating; they may consider quality, delivery, and design strategies to be essential to them. This leads to the fifth hypothesis:

H5: Supply chain flexibility is positively associated with collaborating performance.

Service standard communication has been seen as a relational competence affecting collaborating performance. In the context of airline companies and travel agencies collaborating, complementarities with partner competencies in terms of personnel and assets enhance the knowledge connections between partners (Fan and Ku, 2010; Ku et al., 2011; Vashdi et al., 2007), which facilitates sharing and communicating firm-specific knowledge with suppliers for the creation of new knowledge in the collaborating relationship (McKinney et al., 2004). Accordingly, service standard communication between travel agencies and airline companies encourages joint decision making of collaborating. Therefore, communication of resources by the suppliers will also facilitate a high degree of collaborating performance. This leads to our sixth hypothesis:

H6: Service standard communication is positively associated with collaborating performance.

2.7. Control variables

Control variables are used to account for factors other than the theoretical constructs of interest, which could explain variance in the dependent variable. In this study, classified of travel agent, total revenue, and number of employees of the industry are used as control variables. Classified of travel agent may influence consumer decisions regarding the purchase of a specific tourism product (Triantafillidou et al., 2010). Total revenue of travel agent is perceived as an indication of market share, and of the advantage of competition (Harris and Duckworth, 2005; Ku et al., 2013), all of which can affect strategic choice. On the other hand, number of employees can be subject to the core competencies, which can enhance their collaborative performance (Fan and Ku, 2010; Ku et al., 2013; Walker et al., 2002). Since we are using a cross-country sample, controlling for the effect of collaborative performance of the industry is necessary.

3. Research methodology

The objective of this study was to investigate how supply chain factors of a travel agent's collaboration affects collaborating performance. In this study, the unit of analysis was the travel agency.

The survey items in the questionnaire were checked and refined for translation accuracy by two professors in travel management. The Chinese version of the draft was then pretested with 30 participants (including sales and marketing personnel and CEOs) for face and content validity, and the wording of some survey items modified.

The questionnaire were mailed accompanied by postage-paid, preaddressed return envelopes; each questionnaire had a cover page explaining the goals of the survey, a plea for participation, and instructions for completing the questionnaire. In line with Dillman's total design method, three weeks after the first mailing, new cover letters, questionnaires, and postage-paid, preaddressed return envelopes were sent to the managers of travel agencies wherever they could be identified; where "managers" did not exist officially, the questionnaires were mailed to the key persons responsible for the strategic activities of the travel agencies.

The questionnaires were sent to 2000 travel agents randomly selected from the Tourism Bureau list of agencies of four countries (Taiwan, Main China, Hong Kong, and Singapore), and 347 usable responses of fully completed questionnaires were received.

Table 1 shows that about 40% of the respondents were smaller firms with assets less than NT$15 million and fewer than 20 employees. As all the subjects were travel agencies, it was checked if there was nonresponsive bias in terms of firm size. First, the responding and nonresponding firms were compared in terms of country, company assets, and number of employees. Independent sample t-tests ($p > 0.05$) revealed no significant differences between the two groups. Similarly, comparisons in terms of the three types of measures also showed no significant differences.

3.1. Measurement development

The constructs of the study were measured with a multi-item Likert scale by assigning numbers to different opinions (1: strongly disagree; 2: disagree to some extent; 3: uncertain; 4: agree to some extent; 5: strongly agree); all constructs were measured by using multiple-item perceptual scales that used pre-validated instruments from prior studies whenever possible and were reworded to relate specifically to the context of online communities. Items used to measure delivery quality were from Kim (2006), and items used to measure complementarities with partner competencies were modified from the scale of Sivadas and Dwyer (2000). Supply chain flexibility was measured using three items adapted from Gosain et al. (2004), and items were adapted from Lytle and Timmerman (2006) and Ku et al. (2011) to measure service standard communication, and items from Kale et al. (2002) were used to measure collaborating performance, as shown in Table 2.

Table 1
Sample description (N = 347).

	Number of travel agents	Percentage of firms
Country		
Taiwan	164	47.3
Main China	138	39.8
Hong Kong	22	6.3
Singapore	23	6.6
Classified of travel agent		
Wholesaler	63	18.2
Tour operator director sales	280	80.7
Retail travel agent	4	1.2
Total revenue per year (NT$)		
Less than 2 million	46	12.3
2 million – 15 million	85	24.5
15 million – 60 million	77	22.2
60 million – 100 million	66	19.0
Over 100 million	73	21.0
Number of employees		
Less than 10	56	16.1
11–19	83	23.9
20–29	52	15.1
30–39	43	12.4
39–49	47	13.5
Over 50	66	19.0

3.2. Statistics procedure of data

The internal consistency reliability was assessed by calculating Cronbach's alpha values, which was we followed the two-step procedure suggested by Anderson and Gerbing (1988) to analyze the collected data. Specifically, before incorporating the structural restrictions, the measurement model was estimated and respecified. The LISREL 8.50 program was used to perform confirmatory factor analysis (CFA) to test the convergent and discriminant validity of the remaining items and scales.

Discriminant validity is the degree to which the measures of two constructs are empirically distinct (Bagozzi and Yi, 1991). Discriminant validity is shown when the square root of each construct's AVE is larger than its correlations with other constructs.

4. Analysis and results

4.1. Tests of the measurement scales

The results of internal consistency reliability are summarized in Table 3. The internal consistency (Cronbach's alpha) of the construct was greater than 0.9, which is above the acceptable threshold.

Because multiple-item constructs measure each variable, factor analysis with varimax was used to check unidimensionality among the items. The confirmatory factor analysis shown in Table 4 was used with LISREL 8.50 software to examine the convergent validity of each construct (Kandemir et al., 2006; Revilla and Knoppen, 2012). The range for factor loadings was 0.65–0.86.

4.2. Measurement model

This study assessed construct reliability by calculating composite reliability, which assesses whether the specified indicators are sufficient in the representation of their respective latent factors. These estimates of composite reliability of latent factors range from 0.78 to 0.87, which are all well above the threshold of 0.70 (Jöreskog and Sörbom, 1982). Thus, acceptable construct reliability is implied (as shown in Table 5). However, composite reliability cannot reflect the amount of variance that is captured by the construct in relation to the amount of variance caused by measurement error (Claes and David, 1981). Thus, the average variance extracted (AVE) estimate was used to acquire this information.

As shown in Table 5, all AVE estimates were well above the cutoff value, suggesting that all measurement scales have convergent validity. Results also show that the square roots of all AVE estimates for each construct are greater than the interconstruct correlations; thus, discriminant validity is supported.

4.3. Test of the structural model

LISREL 8.50 software was used for this analysis. Structural equation modeling was performed to test the hypothesized model presented in Fig. 1. The overall goodness-of-fit was assessed in terms of the following eight common model fit measures: GFI, 0.92; AGFI, 0.88; RMSEA, 0.069; NFI, 0.92; CFI, 0.95, PNFI, 0.72; and PGFI, 0.63. Also, the variance explained (R-squared) by the three

Table 2
Scale development.

Factor		Item	Reference
Delivery quality (DQ)	DQ1	They deliver supplies in a timely manner.	Kim (2006)
	DQ2	Their deliveries are reliable.	
	DQ3	They have products/services readily available as requested.	
Complementarities with supplier competencies (CSC)	CSC1	In retrospect, there was a good match between your company's objectives for developing new product and that of your supplier's in developing new product.	Sivadas and Dwyer (2000)
	CSC2	The product development effort benefited from its closeness to both company's existing products	
Supply chain flexibility (SCF)	SCF1	Assess your company's ability to rapidly phase out old products and introduce new ones in conjunction with < Supplier Organization > in comparison with industry norms.	Gosain et al. (2004)
	SCF2	Assess your company's ability to rapidly respond to change in demanded product volumes in conjunction with < Supplier Organization > in comparison with industry norms.	
	SCF3	If an eligible new supplier were to be available that you wanted to do business with, how easy would it be to replace < Supplier Organization > with new supplier, in terms of making the required organizational changes?	
Service standard communication (SSC)	SSC1	We enhance our service capabilities through the use of "state of the art" technology	Lytle and Timmerman (2006)
	SSC2	Technology is used to build and develop higher levels of service quality	Ku et al. (2011)
	SSC3	We use high levels of technology to support the efforts of men and women on the front line	
Collaborating performance (CP)	CP1	The collaboration is characterized by a strong and harmonious relationship between the collaborating suppliers.	Kale et al. (2002)
	CP2	The company has achieved its primary objective(s) in forming this collaboration.	
	CP3	The company's competitive position has been greatly enhanced due to the collaboration.	
	CP4	The company has been successful in learning some critical skills or capabilities from its collaboration. supplier.	
	CP5	Please give an overall assessment of this collaboration, based on all the above dimensions.	

Table 3
Reliability.

Item	Mean	STD	Cronbach's alpha after deleted
DQ1	3.80	0.724	0.914
DQ2	3.97	0.656	0.913
DQ3	3.85	0.724	0.913
CSC1	3.87	0.680	0.914
CSC2	3.99	0.721	0.914
SCF1	3.68	0.705	0.913
SCF2	3.70	0.703	0.912
SCF3	3.97	0.734	0.923
SSC1	3.84	0.649	0.913
SSC2	3.80	0.644	0.912
SSC3	3.47	0.780	0.914
CP1	3.95	0.663	0.912
CP2	3.83	0.697	0.911
CP3	3.75	0.788	0.910
CP4	3.83	0.706	0.914
CP5	3.78	0.706	0.913

endogenous variables is reasonable (R-squared $\geq$ 0.30), so the endogenous variables are reasonably explained by the factors proposed in the study. As presented in Table 6, the results of this hypothesized full model indicate a favorable fit of the model (see Fig. 2).

The significance and relative strength of individual links specified by the research model were also evaluated. The results provide meaningful support for the research hypotheses, besides hypotheses one, the other five were fully supported.

Hypothesis that delivery quality positively associated with flexibility of supply chain was not supported by this analysis (**t**-value = 0.39, **p** > 0.1). The importance of technological competence for collaborative work has already been established by several studies (Mitsuru, 2009). There may be differences in terms of delivery goal between airline companies and travel agencies, such as market strategy or efficiency-focused strategy (Lytle and Timmerman, 2006). However, there was no significant interaction between delivery quality and with flexibility of supply chain found in this study.

Hypothesis 2, delivery quality is positively associated with service standard communication of supply chain, was supported (**t**-value = 6.37, **p** < 0.05). The step toward standardization results from continued relations between allying suppliers. The value of delivery quality adaptation will improve the travel agencies' communications and raise service standards.

Hypothesis 3, which postulates a positive association between complementarities with partner competencies and supply chain flexibility, was supported (**t**-value = 3.98, **p** < 0.05). Complementarities with partner competencies affects supply chain flexibility and the resulting impact on collaborating performance. Obviously, complementarities with partner competencies play an important role in aligning suppliers' performance.

The positive association between complementarities with partner competencies and service standard communication of supply chain was supported in this analysis (**t**-value = 3.47, **p** < 0.05). Travel agencies gained the main communication ground through application of information technology with airline companies; similarly, complementarities with partner competencies enable the standard communication with their suppliers.

Hypothesis 5, which postulates a positive association between supply chain flexibility and collaborating performance, was supported (**t**-value = 7.35, **p** < 0.05). The airline companies and travel agencies are examples of industries that have attempted to implement supply chain flexibility with varying degrees of performance from collaborating.

The positive association between service standard communication and collaborating performance was supported in this analysis (**t**-value = 2.43, **p** < 0.05). Standard communication between travel agencies and airline companies encourages joint decision making of collaborating.

One model included only the theoretical variables of interest in this study and excluded the control variables, and the other model included only the control variables. The results, summarized in Table 7, indicate that the control variables accounted for a small proportion of the variance in collaborating performance (5.6%), and the addition of the theoretical variables resulted in an increase of 42 percent in the R^2 value of firm performance (47.6−5.6 = 42.0%).

Table 4
Confirmatory factor analysis.

Variables	DQ	CSC	SCF	SSC	AS
They deliver supplies in a timely manner.	0.72				
Their deliveries are reliable.	0.85				
They have products/services readily available as requested.	0.79				
In retrospect, there was a good match between your company's objectives for developing new product and that of your supplier's in developing new product.		0.67			
The product development effort benefited from its closeness to both company's existing products		0.65			
Assess your company's ability to rapidly phase out old products and introduce new ones in conjunction with < Supplier Organization > in comparison with industry norms.			0.69		
Assess your company's ability to rapidly respond to change in demanded product volumes in conjunction with < Supplier Organization > in comparison with industry norms.			0.75		
If an eligible new supplier were to be available that you wanted to do business with, how easy would it be to replace < Supplier Organization > with new supplier, in terms of making the required organizational changes?			0.65		
We enhance our service capabilities through the use of "state of the art" technology				0.86	
Technology is used to build and develop higher levels of service quality				0.93	
We use high levels of technology to support the efforts of men and women on the front line				0/72	
The alliance is characterized by a strong and harmonious relationship between the alliance suppliers.					0.74
The company has achieved its primary objective(s) in forming this alliance.					0.80
The company's competitive position has been greatly enhanced due to the alliance.					0.84
The company has been successful in learning some critical skills or capabilities from its alliance supplier.					0.71
Please give an overall assessment of this alliance, based on all the above dimensions.					0.71

All the factor loadings are significant at 0.05 level.

Table 5
Measurement model estimation.

Item	DQ	CSC	SCF	SSC	CP	AVE
DQ	***0.79***					0.62
CSC	0.435	***0.81***				0.65
SCF	0.447	0.482	***0.81***			0.65
SSC	0.627	0.427	0.407	***0.84***		0.71
CP	0.558	0.595	0.595	0.579	***0.76***	0.58

Square root of AVE for each construct was shown in the diagonal of the correlation matrix. Bold: $p < 0.05$.

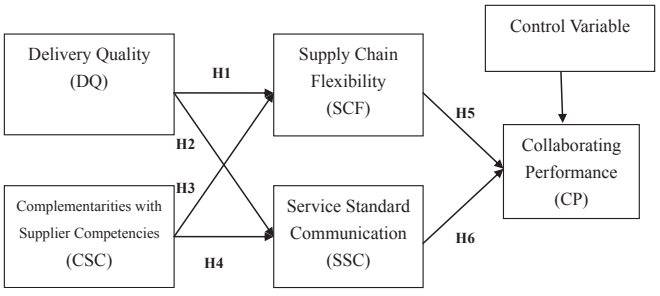

Fig. 1. Research model.

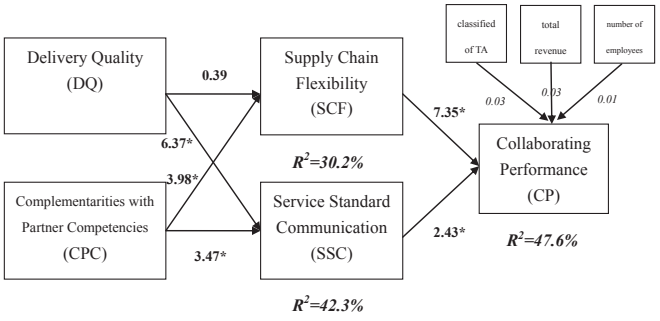

Fig. 2. Hypothesis and testing.

In contrast, the addition of the control variables to the theoretical variables accounted for a very small increase (47.6−46.1 = 1.5%) in the R^2 value of firm performance.

5. Conclusions and implications

Travel agencies have to identify their collaborating strategy so that the airline companies can provide for the associated demands competitively affecting the travel industry such as increasing delivery quality and complete knowledge about suppliers' competencies in a collaborating relationship the commodity-like nature of the tourism products offered by airline company collaboration.

5.1. Implication for research

The intersection of firms' collaborating as an increasingly important source of a firm's competitive advantage offers many rich opportunities for research. Delivery quality and complementarities with partner competencies have emerged as an important asset in airline and travel agency collaborating, which can be used to increase the performance of knowledge works through management of supply chain flexibility. Focusing attention on travel agencies and their pivotal collaborating suppliers, the study utilized a multidimensional measure of factors that influence strategic collaborating, which is intuitively appealing and reliable.

This study utilized a reliable multidimensional measure of factors that influence collaborating performance. The results of the analysis of the measurement model indicate that the proposed metrics have an acceptable degree of validity and reliability. Overall, the results of the study provided reliable instruments for operationalizing the key effect constructs in the analysis of collaborating performance. From a theoretical perspective, finding of the study support encouraging collaborating between airline companies and travel agencies, delivery quality can contribute to collaborating performance to some extent, and the supply chain flexible and service standard communication in collaborating should be considered as a key influential variable in determining collaborating performance.

The findings of this study suggest that facets of resource-based theory are helpful in explaining collaborating performance. Previous research argued that collaborating performance is a widely deployed cost-control mechanism in a variety of markets and

Table 6
Hypothesis and results.

Hypothesis		t-Value	Results
H1	Delivery Quality → Supply Chain Flexibility	0.39	Not Supported
H2	Delivery Quality → Service Standard Communication	6.37*	Supported
H3	Complementarities with supplier competencies → Supply Chain Flexibility	3.98*	Supported
H4	Complementarities with supplier competencies → Service Standard Communication	3.47*	Supported
H5	Supply Chain Flexibility → Collaborating Performance	7.35*	Supported
H6	Service Standard Communication → Collaborating Performance	2.43*	Supported

$P < 0.05^{*}$.

Table 7
Comparison of the structural models.

Results	Full model	Control- variables only model	Theoretical- variables only model
Number of paths in the model	9	3	6
Number of significant paths in the model	5	0	5
Variance explained in firm performance (percent)	47.6	5.6	46.1
Additional variance explained by the theoretical variables	47.6−5.6 = 42%		
Additional variance explained by the control variables	47.6−46.1 = 1.5%		

contexts (Kaufman et al., 2000; Tsantoulis and Palmer, 2008). This study explore the factors that influence the facets of supply chain flexibility in collaborating performance setting. The results imply that suppliers' evaluation of the supply chain factors also has a spillover effect on collaborating performance. Thus, another direction for future research is to examine how flexible and standard communication is useful in pivotal collaborating.

5.2. Implications for practice

First, delivery quality from airline companies improves a travel agency's ability to develop and operate more effectively, although the findings of do not support the existence of any positive association between delivery quality and supply chain flexibility in the collaborating; however, in the collaborating relationship, a travel agent will align the specific delivery quality from pivotal partner and lead the unique market strategy by standard communication. Travel agents face an increasingly competitive market, and delivery quality will continue to play a significant role in this context.

For example, travel agencies target different levels of airline companies; given their competence, the airline companies are treated as ideal opportunities to increase market share. Through delivery quality from airline companies, airline companies have products readily available as requested by collaborating travel agencies; thus, travel agencies can develop unique traveling plan and serve the needs of the travelers.

Second, complementarities with partner competencies act across the airline companies and travel agencies, especially in relation to price strategy, and facilitate the development of knowledge competence. For a travel agency, knowledge can already exist in the organization or it can be sourced from airline companies. In developing a collaborating relationship, market knowledge is modified or reconfigured in some way. Likewise, complementarities with partner competencies are therefore an example of supply chain flexibility and are strategically important for a travel agent.

Complementarities with partner competencies are important to the survival of a travel agency, as organizations develop pivotal patterns of collaborating behavior. For example, wholesalers can develop multi-authorized or sole agency strategies from airline companies, and the travel agency will then create competitive differentiation by facing the global market.

Third, for travel agencies, it is important to possess a service standard communication to align the relationship, and top manager of travel agencies in such relationship can develop their commitment to strategic goals. The results of this study indicate that service standard communication significantly influences collaborating performance. Adapted service standard communication in inter-organizational systems (i.e., GDS) can help travel agencies become more efficient and more competitive by streamlining operations between airline companies and travel agencies. Therefore, specific to the travel industry, messaging service standards between airline companies and travel agencies will increase to meet the challenges in customer relationship management pertinently.

For example, an airline company can develop a unique reservation policy that defines how collaborating travel agencies are to be treated, and travel agencies can develop a program within GDSs that could function as a model for the airline industry between their collaboration, such as meeting with the collaborating advisory board to extend service and determine solutions that meet the needs of both agents and travelers. Through the service-standard communication, travel agencies can develop services to align with travelers' needs.

Fourth, supply chain flexibility will significantly affect collaborating performance for travel agency collaboration. It seems reasonable that implementing the aforementioned strategic actions should translate into more profitable business relations between airline companies and travel agencies. Moreover, flexibility of the factors contributing to the performance of the relation between airline companies and travel agents could aid both the ongoing management of existing relations and also to the selection of airline companies as potential suppliers. Results of this study suggest that travel agents should spread the seed of kindness, show a cooperative attitude, and value relations with the airline companies. Similarly, airline companies that travel agents see as assimilated, cooperative, and committed to their relations can expect to receive more offers from travel agents to establish long-term business relationships.

It is important that travel agencies align a collaborating network to their strategy by developing competence in the process of pivotal network building and by discussing flexible and standard communication in their collaboration. Through the pivotal collaborating suppliers' communications, travel agencies can develop their services to align with the needs of the travelers.

5.3. Limitations

The first limitation of this study was that it did not analyze the motivation factor of aligning between airline companies and travel agencies. Second, it did not compare the different operation scopes of travel agents – wholesalers and retailers have different optimal strategies, and their motivations for knowledge sharing differ. Both of these limitations should be addressed by future studies.

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