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Brand relationship between global airline alliances and their member airlines

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ABSTRACT

Brands and branding are crucial to global airline alliances in establishing competitive superiority. Although most previous studies have focused on the operational and strategic advantages of alliances, this study investigates the brand relationship between global airline alliances and their member airlines. The equity effect of alliance and member brands on passenger purchasing is also examined. A conceptual model is proposed in which member airlines dominating local markets are assumed to directly influence alliance brands, whereas brands that are unfamiliar to passengers are assumed to influence passenger brand attitude toward an alliance through a halo construct. A stratified sampling survey was conducted at Taiwan Taoyuan International Airport to collect empirical data for evaluating the proposed model. Overall, 450 respondents were included: 137 from EVA Air (Star Alliance), 138 from China Airlines (SkyTeam), and 175 from Cathay Pacific (Oneworld). Through structural equation modeling, this study showed that passengers had dissimilar perceptions about member airlines in an alliance, implying that the global airline alliance brand has not been completely integrated with its member brands. The alliance and airline brands were mutually endorsed; however, their effects on passenger purchasing were unequal. Although enhancing passenger perceived equity of individual airlines considerably changed the purchasing of airline and alliance products, improving passenger brand attitude toward an alliance substantially affected the purchasing of alliance products but not airline products. In addition, passenger purchasing behaviors among the three global airline alliances were dissimilar. Finally, according to the results, managerial implications for alliances and airlines are provided.

1. Introduction

Global airline alliances play a major role in global aviation markets. The three airline alliances Star Alliance, SkyTeam, and Oneworld include 28, 30, and 16 member airlines, respectively (as of July 2015), which jointly provide more than half of all airline seat capacity and serve approximately 60% of international travelers. Despite their large passenger volume, global airline alliances are facing fierce competition from low-cost carriers, Gulf-based airlines, and other international airlines (OAG, 2015). This compels alliance airlines to enhance their competitiveness under agreements with alliances and other member airlines (e.g., service compatibility and information technology connectivity). In ensuring that passengers enjoy consistent services when traveling with different member airlines, these agreements may restrict the flexibility of member airlines in devising competitive strategies. As the competition in global aviation markets becomes increasingly fierce, the alliances may be more fragile than they appear. For example, despite belonging to two alliances, American Airlines (AAL) and Korean Air announced in February 2015 that they have signed an agreement to begin code-sharing flights between Dallas/Fort Worth International Airport in the United States and Incheon International Airport in Seoul, South Korea. Such an act by member airlines would increase the motivation of alliances and their member airlines to gain or maintain competitiveness.

Brands and branding are crucial to firms in establishing competitive superiority (Keller and Lehmann, 2006); this also applies to global airline alliances and their member airlines (He and Balmer, 2006). Studies have recognized the importance of brands for airlines. For example, Chen and Chang (2008) investigated the relationships among airline brand equity, brand preference, and purchase intentions. The authors demonstrated that airline brand equity positively affected the purchase intention of passengers. In a

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follow-up study, Chen and Tseng (2010) found that passengers' perceived quality and brand images of airlines positively affected their loyalty to airline brands.

Unlike airline brands, alliance brands have gained limited attention. Studies on global airline alliances have mostly focused on operational (e.g., cost reduction by code-sharing) and strategic (e.g., network extension with allied airlines) advantages; however, alliance brands and their effect on passenger purchasing are rarely discussed. In investigating global airline alliance brands, He and Balmer (2006) qualitatively evaluated the brand and branding activities of Oneworld and suggested that the Oneworld brand was not mature but could develop into a valuable strategic resource. By using fictitious scenarios to investigate passenger responses, Woisetschläger et al. (2008) demonstrated that the announcement of joining or leaving an alliance altered the brand image of airlines; moreover, global airline alliance brands were affected by the entry or exit of airlines with different brand strength. Wang (2014) investigated the effect of being an alliance member on enhancing airline brand equity, which successively affected passenger purchase intention and crucially influenced the passengers who were highly involved in global airline alliances.

The aforementioned brief review suggests that global airline alliance brands are affected by their member brands, and, similar to individual airline brands, alliance brands affect passenger purchase intention. However, the review also indicates that global airline alliance brands and their effects have been evaluated only qualitatively (He and Balmer, 2006) or by using fictitious scenarios (Woisetschläger et al., 2008). How can global airline alliance brands and their effects be measured? What is the current status of the three global airline alliance brands? The answers to these questions are crucial to airlines in deciding whether to enter or exit an alliance (Lazzarini, 2007).

To fill the knowledge gap, this study examined the brands of the three global airline alliances and their effects on passenger purchasing. In particular, scales were proposed to measure passenger brand attitude toward global airline alliances because attitude is considered one of the most crucial antecedents of customer behavior (Ajzen, 2005; Fishbein and Ajzen, 2010). The interactive brand effect between alliances and member airlines as well as its influence on passenger purchasing were investigated using empirical data collected at Taiwan Taoyuan International Airport (TTIA). The Taiwanese international aviation market was chosen because China Airlines (International Civil Aviation Organization [ICAO] code: CAL) and EVA Air (ICAO code: EVA), two Taiwanese flag carriers, joined SkyTeam and Star Alliance in 2011 and 2013, respectively. We demonstrate that from a Taiwanese passenger's perspective, global airline alliance brands are not completely integrated. Although the brands of alliances and member airlines are mutually endorsed and positively affect passenger purchasing, the brand influence of airlines on alliances is stronger than that of alliances on airlines.

The remainder of the paper is organized as follows. Section 2 presents hypotheses regarding the brands of alliances and member airlines and their effects on purchasing. Section 3 presents the methodology, including the study design, developed scales, survey and questionnaires, and analysis procedures. Sections 4 and 5 present the results and discussion, respectively. Finally, Section 6 presents the limitations and recommendations for future studies.

2. Hypotheses

2.1. Brand attitude toward global airline alliances and the halo effect

According to Kotler et al. (1991), a brand is "a name, term, sign, symbol, or design, or combination of them, which is intended to identify the goods and services of one seller or a group of sellers and to differentiate them from those competitors" (p. 442). Accordingly, the brands of global airline alliances are based not only on their names (Star Alliance, SkyTeam, and Oneworld) or symbols but also on how passengers, who are aware of the alliances, perceive these alliances. This association then changes passenger attitude toward an alliance as well as determines how passengers attach or consume the alliance products.

Although brand management in global airline alliances is as crucial as it is in other corporations and industries, brand management may be more complex in global airline alliances. First, each global airline alliance includes many airlines; in other words, the brands of global airline alliances are composed of many partner brands. This is different from most alliance brands in other industries where two or only a few numbers of brands were involved. Second, partner airlines in global airline alliances assist one another through various methods, even though the main service of transporting travelers to their destinations is executed by each member airline instead of the alliance. Although alliances offer various joint branding or cobranding activities, such as alliance frequent-flyer benefits or using the same check-in counters for code-share flights, how travelers evaluate the brand of a global airline alliance mainly depends on their travel experiences with individual airlines. Because travelers may be unfamiliar or have no experience with most member airlines, passenger evaluations of alliance brands remain unknown.

Han (1989) suggested that consumers may evaluate a product or service by using two approaches. When consumers are unfamiliar or have no experience with a product, they may use the image of the country of origin (COO) as a halo to infer the quality of the unknown product, and this halo directly changes consumers' beliefs about product attributes and indirectly alters their overall evaluation of products (i.e., consumer attitude toward the products). These beliefs may be positive or negative depending on how consumers judge each brand (Janiszewski and Van Osselaer, 2000; Washburn et al., 2004). Pecotich et al. (1996) demonstrated that the COO image is appropriate for evaluating the brand images of airlines when the airline images are nationalistic. By contrast, when consumers are familiar with a product, they evaluate the product's brand by analyzing the details of product attributes; in other words, they use a summary construct effect approach. Because a global airline alliance includes both familiar and unfamiliar airline brands, both halo and summary effect types may exist, and passengers judge the alliance brand according to member brands (Levin and Levin, 2000).

On the basis of the aforementioned explanation, this study suggests that the brands of global airline alliances, from passengers' perspectives, are formed by two types of evaluations, one following a halo effect approach and the other following a summary effect approach. The evaluation following a summary effect approach includes airlines with which most passengers are familiar (referred to as locally dominant airlines), and passengers can directly examine the equity (i.e., value) of these airlines. By contrast, for airlines with which most passengers may be unfamiliar (referred to as partner airlines), passengers evaluate airline quality through a halo of the COO image, which shapes their beliefs about partner alliances. Passenger evaluations of both familiar locally dominant airlines and unfamiliar partner airlines determine their attitude toward the alliance brand. In summary, we posit the following hypotheses:

H1. Passengers' attitude toward the brand of a global airline alliance depends on their perceived brand images of member airlines. Depending on their familiarity with member airlines, passengers

evaluate the brands of these airlines by using two approaches.

H1a. For locally dominant airlines, passengers can directly evaluate the brand equity, and this perceived equity positively influences passenger attitude toward the alliance brand.

H1b. Passengers evaluate the brands of partner airlines through a halo (i.e., the COO image of the airline). These halos then influence passenger attitude toward the alliance brand. The influence (i.e., a positive or negative effect) of halo effects on alliance brand attitude depends on passenger perceptions of partner airlines.

2.2. Mutual endorsement between alliance and member brands

Joining an alliance is expected to benefit both alliance and partner brands; in other words, both are mutually endorsed. Washburn et al. (2004) showed that the mere act of pairing with another brand elevated consumer evaluations of partner brand equity because consumers expected less risk and more credibility because of the alliance formation. Gammoh et al. (2006) found that brand alliances were mostly effective, particularly when a strong and reputable brand joined an alliance, improving consumer evaluations of a lesser-known brand. Regarding a cause–brand alliance (i.e., partnering charitable organizations with brands), Lafferty et al. (2004) asserted that consumers would accept the alliances that make sense to them.

With regard to an airline alliance, He and Balmer (2006) examined the branding activities of Oneworld, including its vision, corporate visual identities, corporate advertising activities, and sponsorships. The authors concluded that both Oneworld and its member airline brands benefited from mutual endorsement.

According to the aforementioned explanation, we posit the following hypothesis:

H2. Alliances and member airlines are mutually endorsed, and the effect is positive.

2.3. Purchasing and attitude toward an alliance

According to Ajzen (2005) as well as Fishbein and Ajzen (2010), attitude, a latent disposition or tendency to respond with some degree of favorableness or unfavorableness to engaging in behavior, is one of the most crucial antecedents of behaviors. Attitude summarizes an individual's overall evaluation of engaging in a type of behavior; a stronger evaluation indicates a higher likelihood of an individual performing the behavior. In aviation studies, the attitude–behavior relationship has been evaluated for various behaviors, such as airline ticket purchasing (Ruiz-Mafe et al., 2013), in-flight shopping (Huang and Kuai, 2006), and airport shopping (Chung, 2015).

Passengers' attitude toward a global airline alliance refers to their overall evaluation of the alliance products, which includes services provided jointly or independently by member airlines. The services provided by member airlines are justified as alliance products because member airlines offer benefits to passengers who participate in alliance frequent flyer programs (FFPs) or frequently use their allies' flight services (e.g., Star Alliance). In other words, passengers' attitude toward an alliance may change their purchasing of both alliance and member airline products.

On the basis of the aforementioned explanation, we adhere to the attitude–behavior theory and posit the following hypothesis:

H3. Passengers' attitude toward an alliance positively influences their purchasing of both alliance and member airline products.

2.4. Passenger-based brand equity and purchasing

According to Keller (1993), customer-based brand equity is the "differential effect of brand knowledge on consumer responses to the marketing of the brand" (p. 1), which partially implies the value that customers attach to a specific brand; accordingly, stronger corporate brand equity implies stronger customer preferences for corporate products. The positive relationship between customer-based brand equity and purchasing has been confirmed in airline studies (Chen and Chang, 2008). We further extend this relationship to alliance products because, as previously mentioned, member airline products constitute alliance products. Thus, we posit the following hypothesis:

H4. Passenger perceived equity of a locally dominant airline, which is also a member airline of an alliance, positively influences their purchasing of both alliance and partner airline products.

The aforementioned hypotheses are summarized in Fig. 1.

3. Methodology

3.1. Selection of locally dominant airlines and partner airlines

In this study, we hypothesized that passengers' brand attitude toward an alliance represents their mixed perceptions of locally dominant airlines and partner airlines. Selecting locally dominant airlines and representative partner airlines is necessary for collecting data in order to empirically evaluate the developed hypotheses.

The size of Taiwan's aviation market was considered, and one locally dominant airline was selected from each alliance. EVA and CAL are the only two flag carriers that serve intercontinental routes; therefore, EVA and CAL were selected to represent Star Alliance and SkyTeam, respectively. Regarding Oneworld, Cathay Pacific (CAP) was selected because it has dominated the Taipei–Hong Kong route, which constitutes approximately 30% of Taiwan's international air markets with regard to flight frequency; moreover, CAP offers flights in Taiwan's other international aviation markets. Therefore, CAP is the most familiar member airline of Oneworld because Taiwanese flag carriers have not joined Oneworld.

Because of the limited space in the questionnaire, three partner airlines were selected from each global airline alliance. In addition to the founder airlines of the alliances (i.e., United Airlines (UAL), Delta Airlines (DAL), and AAL), the remaining airlines were selected mostly from the Asia-Pacific region and Pacific Ocean markets (i.e., between Taiwan and the America) because of their popularity. The final selected member airlines were (1) Star Alliance: UAL of the United States, All Nippon Airways (ANA of Japan), and Shenzhen Airlines (CSZ of China); (2) SkyTeam: DAL of the United States, China Eastern Airlines (CES of China), and Vietnam Airlines (HVN of Vietnam); and (3) Oneworld: AAL of the United States, TAM Airlines of Brazil, and Malaysia Airlines (MAS of Malaysia).

3.2. Main scales

1. Passenger brand attitude toward an alliance: According to studies by Janawade (2012) and Wang (2014), respondents were asked how useful the following four alliance benefits were, namely "greater network access," "enhanced frequent flyer program benefits," "lower prices and more flexible travel plans," and "extended lounge access."
2. Passenger perceived airline brand equity: On the basis of studies by Keller (1993) and Aaker (1996), five items were developed to measure customer-based brand equity. The respondents were

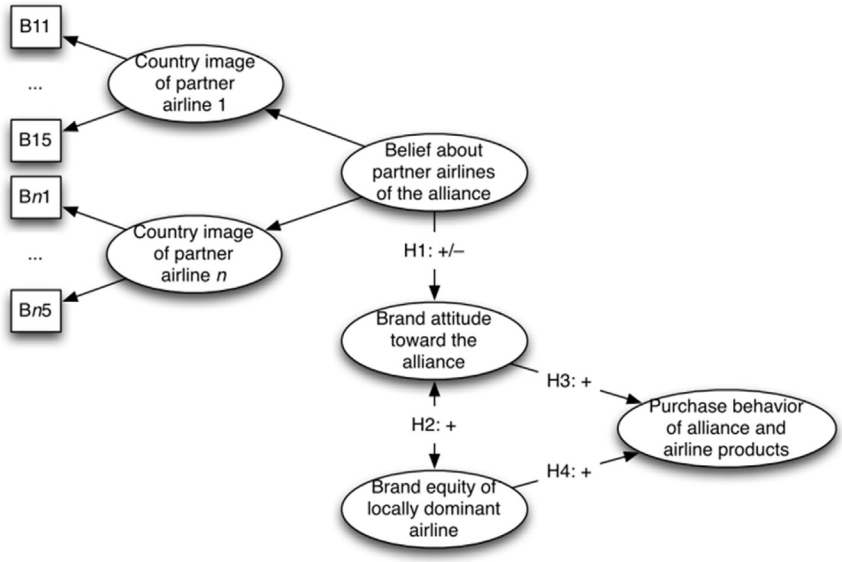

Fig. 1. Proposed hypotheses and effect directions.

asked to report the extent to which they agreed with the following airline descriptions, namely "[the airline] has a good reputation," "[the airline] is very popular," "[the airline] is the first airline I think of," "I chose [the airline] because of my previous traveling experience with [the airline]," and "[the airline] is a leading brand."

3. COO image: Airline COO image was measured in economic and technological dimensions because both dimensions are highly associated with aviation development. According to the study of Martin and Eroglu (1993), seven items were developed. Respondent perceptions of specific countries were measured on a scale from, for example, *low economic development* to *high economic development* and from *unstable economic environment* to *stable economic environment*.
4. Purchasing of airline and alliance products: The concept of loyalty was used to measure passenger intention to purchase airline products. On the basis of the studies of Garbarino and Johnson (1999) and Zeithaml et al. (1996), the following four items were developed: "I would like to recommend [the airline] to my friends," "I would choose [the airline] even though other airlines may offer a cheaper price," "[the airline] is my first choice for traveling abroad," and "With sales terms and conditions similar to other airlines, I would choose [the airline]." Because customers may have less knowledge about alliance products than they do about airline products, we referred to Fishbein and Ajzen (2010) and developed a single item, "I would like to purchase tickets from airlines belonging to [the alliance] in the near future," to measure passenger intention to use alliance products.

Passenger brand attitude toward global airline alliances, brand equity of locally dominant airlines, and loyalty to locally dominant airlines were measured using 5-point Likert scales, from *strongly disagree* to *strongly agree*. The scale of the COO image was measured using a 5-point bipolar scale. The aforementioned scales and corresponding measurement details are summarized in the appendix.

3.3. Questionnaire development and survey

According to the proposed hypotheses, a questionnaire was developed that consisted of four parts. The first part included items for collecting passenger trip information, such as trip purpose. The second part included items for measuring the COO image of the selected airlines. The third part comprised items for measuring alliance brand attitude, brand equity of locally dominant airlines, and purchasing of both airline and alliance products. The fourth part comprised the sociodemographic information of the respondents.

A survey was conducted at TTIA, and stratified sampling was adopted to ensure that the collected samples included passengers from the selected locally dominant airlines and alliances, namely EVA (Star Alliance), CAL (SkyTeam), and CAP (Oneworld). Trained survey conductors contacted passengers who were traveling on these airlines and performed a face-to-face survey in the departure lobby. The questionnaire was self-administered; however, the conductors provided assistance if the passengers had any doubts.

Overall, 485 questionnaires were distributed, and 450 valid questionnaires were received, resulting in an effective response rate of 92.8%. The valid questionnaires included 137, 138, and 175 questionnaires from EVA (Star Alliance), CAL (SkyTeam), and CAP (Oneworld) passengers, respectively.

3.4. Analysis procedure

The sociodemographic characteristics and flying experience of the respondents were examined using descriptive statistics and statistical tests. Cronbach's α and confirmatory factor analysis (CFA) were used to examine the reliability and validity of the developed scales. The main analysis comprised two parts. In the first part, structural equation modeling (SEM) was used to examine the proposed causal relationships among the passengers' perceived images of COO, brand equity of locally dominant airlines, and brand attitude toward alliances. In the second part, regression models were used to assess how passenger alliance brand attitude and the perceived brand equity of locally dominant airlines may alter future passenger purchasing.

4. Results

4.1. Sociodemographic characteristics and flying experience of respondents

The average age of the 450 respondents was 31.77 years

(standard deviation = 9.77 years). Male respondents represented 55.1% of all respondents; this value is consistent with the official male percentage (approximately 52%–55%) of Taiwanese people traveling abroad. Regarding occupation, 42.2% of the respondents served in the commercial or service industry; students represented 27.1% of the respondents. Approximately 34.9% of the respondents had experience traveling in business or first-class cabins, and 50% of the respondents had traveled abroad on average 2–4 times annually in the last three years.

4.2. Reliability and validity of the main scales

1. Passenger brand attitude toward an alliance: The validity of the factorial structure of brand attitude toward an alliance measured using the proposed four items was examined using CFA. A *P* value of χ^2 for each alliance was nonsignificant (Star Alliance: *P* value of χ^2 = 0.297; SkyTeam: 0.861; Oneworld: 0.563), indicating that the measurement fit was acceptable. Cronbach's α of the scale attitude toward alliance brand was more than 0.7 (Star Alliance: 0.766; SkyTeam: 0.768; Oneworld: 0.713), indicating that the reliability level was acceptable.
2. Passenger perceived airline brand equity: A similar CFA analysis was conducted for the scale airline brand equity. The results indicated a satisfactory measurement model fit (EVA: *P* value of χ^2 = 0.068; CAL: 0.807; CAP: 0.019; CAP: χ^2/df = 2.696, comparative fit index [CFI] = 0.973, nonnormed fit index [NNFI] = 0.947, root mean square error of approximation [RMSEA] = 0.099 (pclose = 0.087), standardized root mean square residual [SRMR] = 0.034). Although the *P* value of χ^2 of CAP was significant, which may be partially attributed to a relatively large sample size, other goodness-of-fit indices had satisfactory values, including χ^2 per degree of freedom of <3, CFI and NNFI of >0.9, RMSEA not significantly different from 0.05, and SRMR of <0.08. Cronbach's α of the scale airline brand equity exceeded 0.7 (EVA: 0.872; CAL: 0.835; CAP: 0.838), indicating that the reliability level was acceptable.

4.3. SEM analysis of the halo effect and mutual endorsement between alliance and airline brands

We referred to Anderson and Gerbing (1988) to estimate the proposed halo effect models. In the first stage, CFA was performed, followed by a path model for evaluating the proposed causal relationships. An initial halo effect model was developed for each alliance, which assumed that passenger beliefs about partner airline services were indicated by their COO (i.e., a second-order latent variable model) and directly influenced passenger attitude toward an alliance brand. If passenger perceptions about partner airlines conflicted with one another, meaning that the path coefficients between the first- and second-order latent variables had opposite signs, then the COO image with a conflicting sign was dropped Finally, the brand equity of the locally dominant airline was incorporated to observe how partner airlines and locally dominant airlines may combine to change passenger perceptions of alliance brands (i.e., H1 and H2) as well as how the alliance brand may change passenger perceived equity of locally dominant airlines (i.e., H3).

In this study, 11 models were developed, including four each for Star Alliance (Fig. 2) and SkyTeam (Fig. 3) and three for Oneworld (Fig. 4). The goodness of fit of these models was satisfactory (Table 1); the estimated models had nonsignificant *P* values of χ^2 or satisfactory values of other goodness-of-fit indices.

The results indicated that the passengers' perceived COO images of partner airlines were not always consistent. In Star Alliance, passenger perception of CSZ of China was inconsistent with that of ANA of Japan and UAL of the United States. In SkyTeam, passenger perception of DAL of the United States was inconsistent with that of CES of China and HVN of Vietnam. Only the partner airlines selected from Oneworld (i.e., AAL of the United States, TAM of Brazil, and MAS of Malaysia) showed consistent perceptions; the standardized path coefficients from passengers' belief to three Oneworld partner airlines were all positive even though the standardized path coefficients of the partner airlines were small, particularly for AAL of the United States (standardized path coefficient: 0.065). Subsequently, the partner airlines with inconsistent COO images were dropped in the revised halo model, and the remaining partner airlines displayed consistent relationships with one another (Figs. 2[b] and 3[b]).

The final halo effect models (Figs. 2[b], 3[b], and 4[a]) showed that the relationship between passengers' beliefs about the selected partner airlines and their brand attitude toward an alliance could be positive (Star Alliance) or negative (SkyTeam and Oneworld). More specifically, the Star Alliance model (Fig. 2[b]) consists of two developed countries, the United States (UAL) and Japan (ANA), and exhibits a significantly positive relationship between passengers' belief about Star Alliance and their attitude toward the alliance. The SkyTeam model comprises CES and HVN from China and Vietnam, respectively, which are two developing countries, and demonstrates a significantly negative relationship between passengers' belief about SkyTeam and their attitude toward the alliance. The Oneworld model consists of three airlines, AAL, TAM, and MAS from the United States, Brazil, and Malaysia, respectively, which are a combination of developed and developing countries, and this model exhibits a nonsignificantly negative relationship between passengers' belief about Oneworld and their attitude toward the alliance.

Subsequently, the brand relationship between locally dominant airlines and alliances was evaluated by adding the passengers' perceived equity of the locally dominant airlines into the models. First, the endorsement effect of the locally dominant airlines on alliances was tested (Figs. 2[c], 3[c], and 4[b]), and the endorsement effect of alliances on the locally dominant airlines was then tested (Figs. 2[d], 3[d], and 4[c]). The airline-to-alliance models showed that the significant relationship between passengers' beliefs about partner airlines and attitude toward the alliance brand was maintained in the SkyTeam and Oneworld models (Figs. 3[b] vs. [c] and Fig. 4[a] vs. [b]) but became nonsignificant in the Star Alliance model (Fig. 2[b] vs. [c]). Moreover, the passengers' perceived brand equity of locally dominant airlines demonstrated significantly positive effects on their brand attitude toward an alliance in the Star Alliance, SkyTeam, and Oneworld models (Figs. 2[c], 3[c], and 4[b]). On the other hand, the alliance-to-airline models (Figs. 2[d], 3[d], and 4[c]) displayed also significant effects of alliance brands on the brand equity of locally dominant airlines in all three airline alliances. In summary, the results suggested that the brands of alliances and locally dominant airlines were mutually endorsed.

4.4. Regression analysis of purchasing

Regression analysis was performed to evaluate future consumer purchasing. Two types of purchasing were considered: the intention to purchase alliance products (i.e., purchasing tickets from airlines belonging to the same global airline alliance) and loyalty to locally dominant airlines.

First, CFA was performed to evaluate the single-factor structures of the four loyalty items. The results showed that the single-factor structures of the four loyalty items in three locally dominant airlines all had a nonsignificant *P* value of χ^2 (EVA: 0.945; CAL: 0.559; CAP: 0.714), indicating a satisfactory goodness of fit. Therefore, their CFA scores were computed and used for subsequent

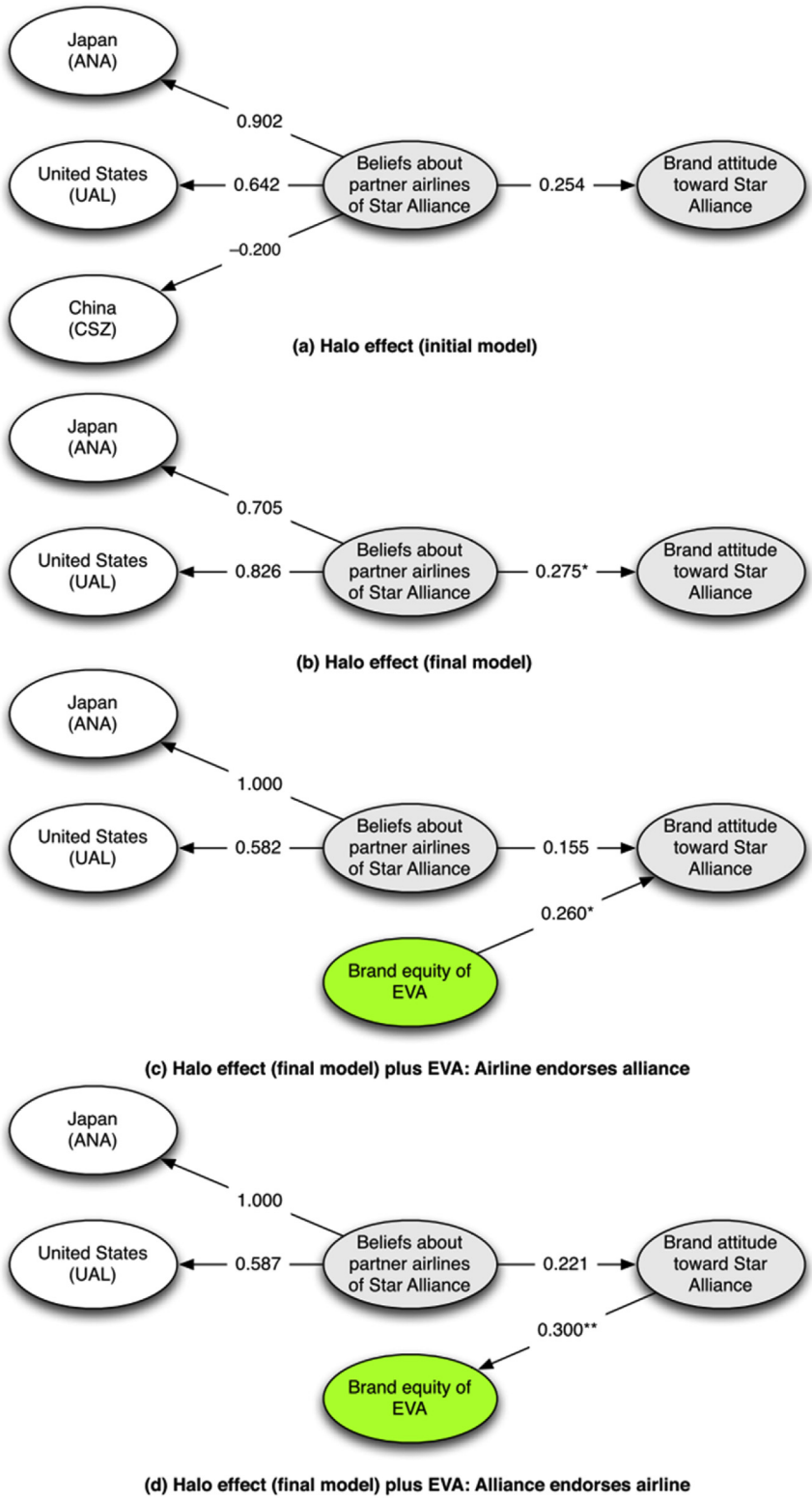

Fig. 2. Halo and brand equity effect on alliance brand attitude: Star Alliance.

regression analysis.

We investigated two dependent variables, the intention to purchase alliance products and loyalty to locally dominant airlines, in the regression analysis. The CFA score of the intention to purchase alliance products is an ordered response, whereas that of loyalty to locally dominant airlines is a continuous response. Accordingly, the first and second dependent variables were estimated using ordered logistic and linear regressions, respectively. All data sets were pooled together (sample size = 450) to conduct regression analysis.

A seemingly unrelated regression analysis would have been appropriate in this study because possible correlations may exist

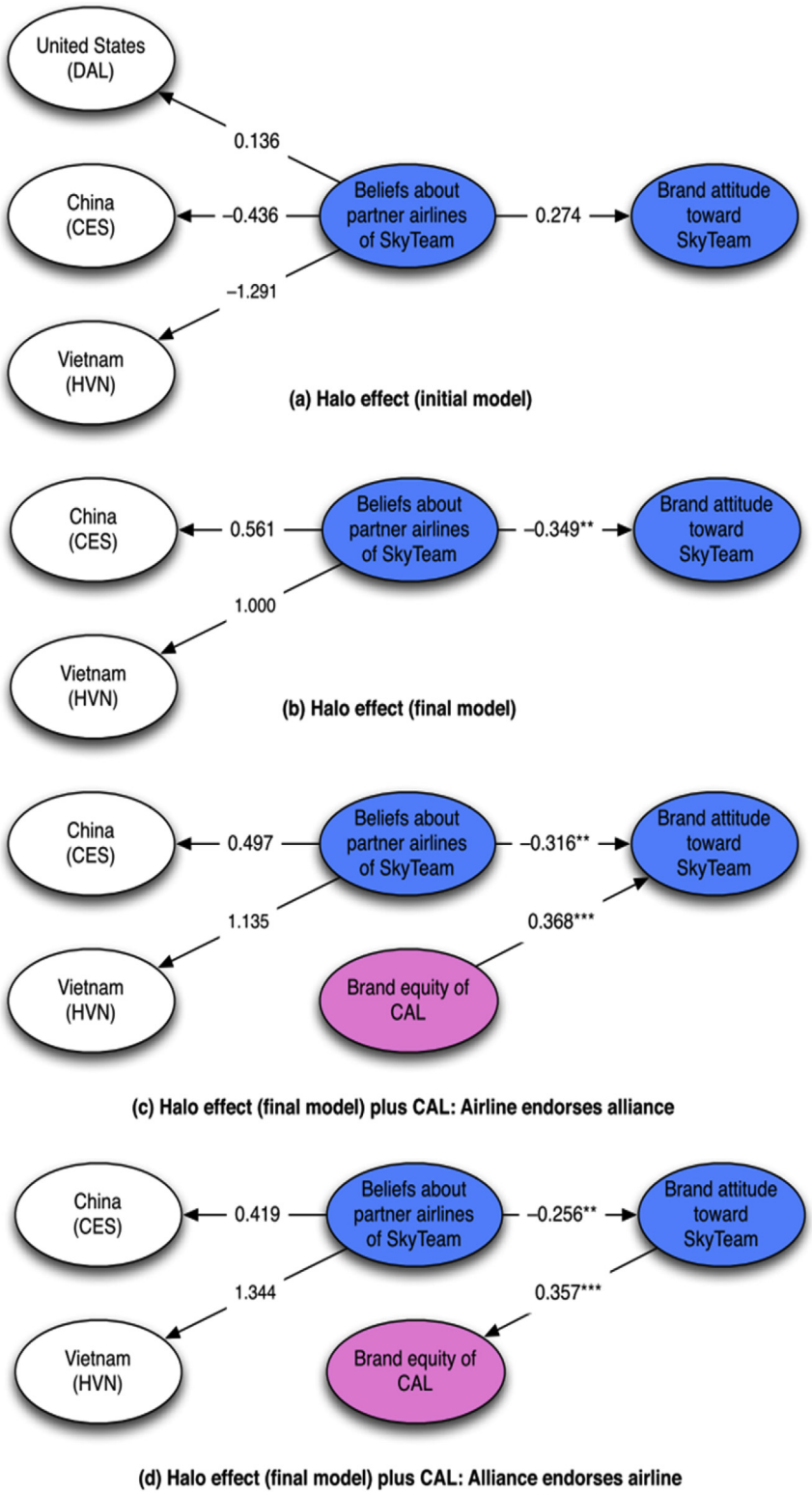

Fig. 3. Halo and brand equity effect on alliance brand attitude: SkyTeam.

between the intention to purchase alliance products and loyalty to locally dominant airlines. However, we used the same set of variables to explain these two dependent variables; therefore, a seemingly unrelated regression analysis would have produced the same result that a conventional (separate) regression analysis would have produced.

Two models were developed for each type of purchase: reduced and full. Reduced models that consisted of only brand variables and airline–alliance dummy variables were first developed, followed by full models, in which passenger sociodemographic variables and trip characteristics were added. The results are summarized in Table 2.

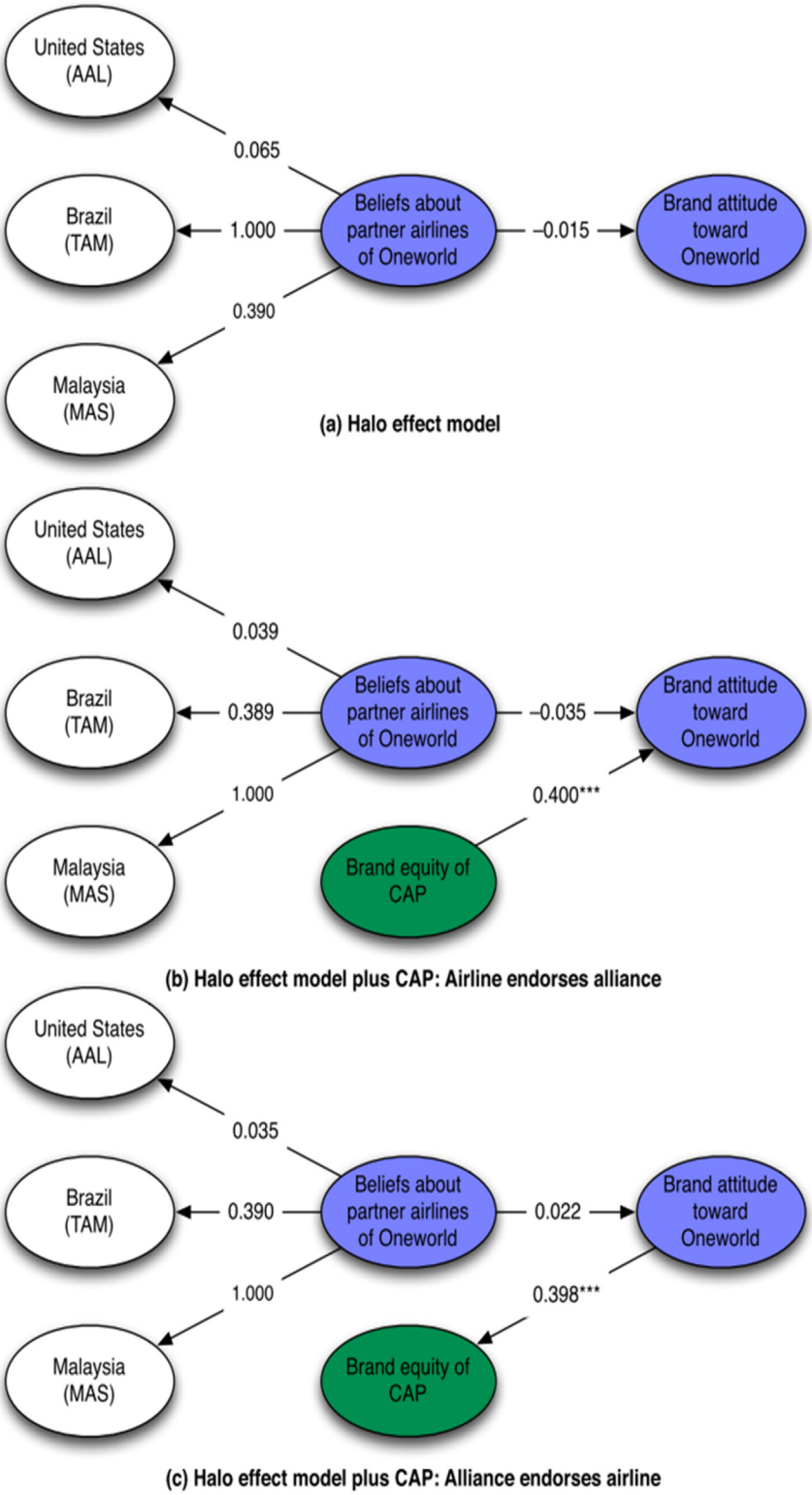

Fig. 4. Halo and brand equity effect on alliance brand attitude: Oneworld.

The regression results showed that the effect of brand variables on purchasing was consistent among the models. The passengers' perceived brand equity of locally dominant airlines was positively associated with both loyalty to locally dominant airlines ($P < 0.001$ in Model M2) and the intention to purchase alliance products ($P < 0.001$ in Model M4). By contrast, passengers' brand attitude toward an alliance exerted a positive influence only on alliance products ($P < 0.001$ in Model M4) but not on airline products ($P > 0.05$ in Model M2). In other words, the passengers' perceived brand equity of locally dominant airlines had a dual effect: it affected their loyalty to locally dominant airlines and also influenced airline allies. By contrast, passengers' brand attitude toward an alliance had a significant effect only on the intention to purchase tickets from alliance member airlines; its positive effect on locally

Table 1
Goodness of fits of halo−effect SEM models.

Goodness of fit index	Star Alliance				SkyTeam				Oneworld		
	Halo effect		Full		Halo effect		Full		Halo effect (Fig. 4a)	Full	
	Initial (Fig. 2a)	Final (Fig. 2b)	Airline to alliance (Fig. 2c)	Alliance to airline (Fig. 2d)	Initial (Fig. 3a)	Final (Fig. 3b)	Airline to alliance (Fig. 3c)	Alliance to airline (Fig. 3d)		Airline to alliance (Fig. 4b)	Alliance to airline (Fig. 4c)
p-value of χ^2	0.182	0.214	0.001	0.001	0.099	0.098	0.001	0.001	0.003	0.000	0.000
χ^2/df			1.446	1.454			1.470	1.474	1.431	1.557	1.559
SRMR			0.068	0.072			0.063	0.070	0.067	0.076	0.078
RMSEA (pclose)			0.057 (0.259)	0.058 (0.224)			0.059 (0.225)	0.059 (0.216)	0.050 (0.492)	0.057 (0.194)	0.057 (0.190)
NNFI			0.928	0.926			0.923	0.922	0.943	0.910	0.909
CFI			0.939	0.937			0.936	0.935	0.952	0.922	0.921

Table 2
Regression results of alliance and airline products purchase behaviors.

Variables	Locally dominant airline[a]		Alliance[b]	
	Reduced (M1)	Full (M2)	Reduced (M3)	Full (M4)
Airline brand equity	1.233***	1.171***	0.874***	0.877***
Alliance brand attitude	0.115	0.077	2.099***	2.007***
Alliance/Airline[c]				
SkyTeam/CAL	−0.657***	−0.699***	2.153***	2.017***
Oneworld/CAP	−0.672***	−0.732***	2.359***	2.139***
Trip purpose (business = 1)		−0.053		0.566
Buy tickets (via agency = 1)		0.064		−0.105
Company subsidy on airfare (Yes = 1)		0.087		0.232
Gender (Female = 1)		0.015		0.000
Age		0.002		−0.005
Occupation (student = 1)		−0.007		0.366
Education (Master or above = 1)		−0.094		−0.098
Personal income		−1.066		1.028
Traveling frequency		−0.020		0.026
Familiarity with the airline		0.032***		
FFP membership with the airline		0.199***		
FFP membership with the alliance				0.032
Constant/Cut 1	−0.002	0.119	3.779***	3.580***
Cut 2			5.151***	4.952***
Cut 3			6.610***	6.418***
Cut 4			9.534***	9.394***
Adjusted R^b or McFadden's R^b	0.611	0.633	0.096	0.108
Sample size	450	450	450	450

*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.
[a] For locally dominant airline loyalty, the likelihood ratio test showed a significant difference between the reduced and full models ($\chi^2 = 36.98$, $P = .001$).
[b] For alliance purchase intention, the likelihood ratio test showed a nonsignificant difference between the reduced and full models ($\chi^2 = 11.64$, $P = .310$).
[c] Star Alliance/EVA is the reference airline.

dominant airlines was not sufficiently strong to be detected using the collected data.

Most sociodemographic and trip characteristics displayed nonsignificant effects on loyalty to locally dominant airlines and the intention to purchase alliance products. Exceptions were passengers' familiarity and their FFP membership with locally dominant airlines (Model M2); these two variables considerably changed loyalty to locally dominant airlines. In contrast to the significant effect of airline FFP membership, the effect of alliance FFP membership was positive but nonsignificant (Model M4).

The dummy variables representing respondents collected from different alliances and airlines had opposite signs in the airline and alliance models. CAL and CAP passengers demonstrated less loyalty to the corresponding airlines (Models M1 and M2) than EVA passengers did. However, compared with Star Alliance passengers, SkyTeam and Oneworld alliance passengers tended to buy tickets from airlines within the alliance more frequently (Models M3 and M4). In other words, EVA passengers are relatively loyal to the company; CAL and CAP passengers are relatively inclined to buy tickets from other airlines if the airlines belong to the same alliance.

The overall goodness of fit of locally dominant airline models (M1 and M2) is satisfactory. Both the reduced and full models had an adjusted $R^2 > 0.6$. A likelihood ratio test of the difference between the reduced and full models showed a significant result ($\chi^2 = 36.98$, $P = 0.001$), indicating that adding passenger sociodemographic and trip characteristics was helpful in explaining the variation in loyalty to locally dominant airlines; the contribution was mainly derived from the two FFP membership variables. Regarding the alliance models, McFadden's R^2 was 0.096 and 0.108 for the reduced and full models, respectively, indicating that these models explained approximately 10% of the log likelihood with respect to a zero model (a model without any explanatory variable). The likelihood ratio test of the difference between the reduced and full models produced a nonsignificant result ($\chi^2 = 11.64$, $P = 0.310$), indicating that adding passenger sociodemographic and trip characteristics was not significantly helpful in explaining the variation in the intention to purchase tickets from airlines within an alliance.

5. Discussion

In this study, we aimed to evaluate the brands of global airline alliances, proposed four hypotheses, and examined these

hypotheses by using an empirical data set collected at TTIA. The results showed that the relationship between passengers' beliefs about partner airlines and their alliance brand attitude was significant in the Star Alliance and SkyTeam models but not in the Oneworld model. Therefore, H1 is partially supported. H2 assumes positive mutual endorsement between alliance and airline brands and is supported by the empirical analysis. The results showed that, even though the passengers' perceived equity of locally dominant airlines was positively associated with the purchasing both alliance and airline products, the effect of passengers' alliance brand attitude was significant on the purchasing of alliance products but not on the purchasing of airline products. Therefore, H3 is partially supported, and H4 is completely supported.

5.1. Halo effect and passengers' beliefs about member airlines

The results that partially support H1 indicate that the brands of global airline alliances may not have been completely integrated with their member brands despite several efforts, such as building a corporate visual identity (e.g., alliance logos) by attracting sponsorship as a corporation and by advertising the alliance as a corporation (e.g., various advertising campaign activities and winning awards as a corporation). These efforts were undertaken by the alliances to manage the alliance brands as corporate brands. The SEM analysis results demonstrated that passengers have dissimilar or even opposite views about the COO images of member airlines, which weakened passenger beliefs about partner alliances, thus displaying a nonsignificant relationship with passenger alliance brand attitude.

The identified conflicting perceptions of COO images include the following: In Star Alliance, UAL (entered Star Alliance in 1997) and ANA (entered Star Alliance in 1999) conflicted with CSZ (entered Star Alliance in 2012), and in SkyTeam, DAL (entered SkyTeam in 2000) conflicted with CES (entered SkyTeam in 2011) and HVN (entered SkyTeam in 2010). This result presents two patterns. First, the respondents had opposing views of U.S. and Japanese airlines and Chinese and Southeast Asian airlines. Second, they had opposing views of established and new member airlines. Although more studies must be performed to clarify respondents' perceptions of the new member airlines, these airlines were introduced to passengers mostly with an advertising focus on the additional networks these airlines would cover. However, how new carriers can enhance the existing brands has been seldom mentioned by alliances. Although a wider service network provides advantages for passengers, it is only a part of the benefit of including a new carrier in the alliance. Moreover, all global airline alliances share this benefit (e.g., all three alliances have partners in mainland China or Southeast Asia). In other words, a wider network cannot explicitly distinguish the brand image of one alliance from that of another. Because the three global airline alliances have excellent coverage worldwide, other characteristics that increase an alliance's favorability and uniqueness to passengers would help strengthen the brands of alliances when new carriers are introduced.

The identified patterns of passenger beliefs about partner airlines suggest that Taiwan's two locally dominant airlines, EVA and CAL, may consider strengthening their association with U.S. and Japanese airlines because Taiwanese passengers tend to have positive opinions of these airlines. The aforementioned result may not be directly applicable to other passengers because passengers from different regions may have distinct perceptions of alliances and airlines. For example, IATA (2005) showed that passengers from various continents, particularly those from the Asia-Pacific region, mostly ranked Star Alliance as their preferred alliance; however, passengers from the Americas favored other alliances, such as Oneworld.

Because of the limitations of questionnaire length, we selected three airlines to represent an alliance; therefore, the selections may not have completely represented how passengers evaluate the alliance as a whole. However, the selection of member airlines does not affect our conclusion that the current alliance brands have not been fully integrated.

The beliefs formed by the selected member airlines were positively or negatively associated with passengers' alliance brand attitude. If other airlines are added to the model, then the identified relationship may change. For example, if we add Air France (AFR) to the SkyTeam model, then AFR may combine with DAL and air travelers would exhibit a positive collective belief about SkyTeam because AFR is a senior member of SkyTeam and has been rated as an airline with excellent services by Skytrax. In other words, adding AFR to the SkyTeam model is expected to strengthen passengers' positive beliefs about SkyTeam members and their attitude toward the SkyTeam brand. Additional studies are required to confirm this statement.

5.2. Endorsement between alliance and airline brands

The results that completely support H2 indicate that passengers who have a positive perception of an alliance tend to have a positive perception of its local member airlines and vice versa. These results are consistent with those of previous cobranding studies in other industries (Washburn et al., 2004) and the qualitative study of He and Balmer (2006) on Oneworld. Additionally, these results also suggest that joining global airline alliances is practicable for the customers of locally dominant airlines (Lafferty et al., 2004).

Although the alliances and locally dominant airline brands are mutually endorsed, their effect on passenger purchasing is unequal. The results that partially support H3 and completely support H4 indicate that passengers' perceived equity of locally dominant airlines considerably affects both alliance and airline products; however, passengers' attitude toward alliance brands is crucial for the intention to purchase alliance products but not for the enhancement of loyalty to airlines. In other words, from passengers' perspective, global airline alliances are a sub-brand of locally dominant airlines, whereas locally dominant airlines are a supra-brand of airline alliances. According to He and Balmer (2006), this perception may exist partly because alliances alone do not provide services, and consumers position alliance brands after receiving services from individual airlines. Another possible explanation is the partially overlapping networks of member airlines in alliances. When passengers choose airlines in the same alliance, the alliance factor is irrelevant in their decision-making process (Kahneman and Tversky, 1979), and decision making becomes a direct comparison among airline allies. This may be particularly explicit in short-haul markets, in which allies are likely to provide overlapping network services. Thus, global airline alliances should not ignore the competition among member airlines in short-haul markets when expanding their network coverage because such competition increases passengers' difficulty in positioning the brands of alliances, thus reducing brand strength.

This study suggests that locally dominant airlines benefit their brands by joining a global airline alliance because these airlines normally have established their brand strength in local markets; pairing with alliance brands not only enhances their brand strength in local markets but also increases their opportunities in foreign markets. However, brand strength and the association of locally dominant airlines with foreign markets may change after consumers experience the services provided by locally dominant airlines and their allies.

5.3. Market segmentation of airlines and alliances

The effects of passenger sociodemographic factors and trip characteristics on airline loyalty and the intention to purchase alliance products were mostly nonsignificant. In the airline loyalty model, the exceptions were FFP membership and familiarity with an airline, which positively affected passenger loyalty to an airline. In the alliance purchase intention model, the effect of FFP membership was also positive but nonsignificant. These results are consistent with those of previous studies, which have found that FFP membership indicates costs switching from one airline to another and that familiarity with an airline implies a preference for using the services of that airline (Chen and Chang, 2008; Dolnicar et al., 2011; Hess et al., 2007; Jung and Yoo, 2014; Martín et al., 2011).

Studies have also shown that business travelers are more sensitive than non-business travelers to journey time and other time costs, possibly suggesting their intention to travel with an alliance to increase travel convenience. The results showed that business travelers positively affected the purchase of alliance products, but the effect was nonsignificant. This may be partially attributed to the sample size and its relatively weak effect strength. More studies are required to confirm this effect.

6. Limitations and future studies

This study investigated the brands of global airline alliances and their relationship with locally dominant airlines as well as with passenger purchasing. Empirical data were collected from Taiwanese travelers at TTIA; therefore, the results could be interpreted only for this population. Locally dominant airlines may be interested in understanding how foreign passengers may respond to these airlines entering or exiting an alliance. A similar approach could also be used for passengers of other airlines, who recently joined an alliance or are interested in joining an alliance. Another restriction of this study is the subjective division of member airlines into locally dominant airlines and partner airlines. We divided airlines this way because we considered that passengers may not be familiar with all selected member airlines; therefore, directly requesting that respondents evaluate the brand equity of the member airlines may produce invalid results. Future studies may consider a joint analysis of both halo and summary effects (i.e., a direct evaluation) on the evaluation of the brand equity of airlines with which travelers have various levels of familiarity and travel experience. Finally, the revealed positive effects of mutual endorsement between airlines and alliance brands on passenger purchasing support the results of Lazzarini (2007), who used 1995–2000 data to reveal an enhanced operational performance (e.g., load factors) of airlines as a result of their joining global airline alliances or bilaterally partnering with other airlines. This study also demonstrated that the positive effects of alliance and airline brands on purchasing are unequal. Moreover, the purchasing among the passengers of the three alliances was heterogeneous. Future studies should consider how these unequal effects and this heterogeneous purchasing may affect competition within and among alliances.

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Appendix

Measurement of main scales

Passenger attitude toward an alliance (Janawade, 2012; Wang, 2014)[a]
[the global alliance] provides greater network access.
[the global alliance] provides enhanced frequent flyer program benefits.
[the global alliance] provides lower prices and more flexible travel plans.
[the global alliance] provides extended lounge access.
Passenger perceived airline brand equity (Keller 1993; Aaker, 1996)[a]
[the airline] has a good reputation.
[the airline] is very popular.
[the airline] is the first airline I think of.
I chose [the airline] because of my previous traveling experience with [the airline].
[the airline] is a leading brand
Image of country of origin (COO) (Martin and Eroglu, 1993)[b]
[the country] is extremely economically developed/economically underdeveloped.
[the country] has high labor costs/low labor costs.
[the country] has a free market system/a centrally planned system.
[the country] has a high standard of living/a low standard of living.
[the country] has a high level of technological research/a low level of technological research.
[the country] has a welfare system/is lack of a welfare system.
[the country] has a stable economic environment/an unstable economic environment.
Loyalty to airline products (Garbarino and Johnson, 1999; Zeithaml et al., 1996)[a]
I would like to recommend [the airline] to my friends.
I would choose [the airline] even though other airlines may offer a cheaper price.
[the airline] is my first choice for traveling abroad.
With sales terms and conditions similar to other airlines, I would choose [the airline].
Intention to purchasing alliance products (Fishbein and Ajzen, 2010)[a]
I would like to purchase tickets from airlines belonging to [the alliance] in the near future.

[a] 5-Point scale anchored by “Strongly disagree” and “Strongly agree”.

[b] In the survey, we asked respondents to rate the country that appears at the top of the page against a series of descriptors by placing a check (✓) on the scale from one to five that best reflects their judgment. For example, if a respondent felt that the country was extremely economically developed, he or she was asked to mark the scale in the following manner: economically developed

(the country)					
_√_	: ___	: ___	: ___	: ___	economically underdeveloped.
(1)	(2)	(3)	(4)	(5)	

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