Mathies, Christine, Gudergan, Siegfried P., and Wang, Paul Z. (2013) ***The Effects of Customer-Centric Marketing and Revenue Management on Travelers' Choices.*** **Journal of Travel Research, 52 (4) pp. 479-493.**

The Effects of Customer-Centric Marketing and Revenue Management on Travelers' Choices

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Original Submission Date: 23 May 2012
Revised Submission Date: 02 Oct 2012
Final Submission Date: 21 Jan 2013

Keywords

revenue management, customer-centric, fairness, choice model, reference points

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Abstract

This paper examines how the simultaneous use of customer-centric marketing (CCM) and revenue management (RM) affects travelers' perceptions of fairness and ultimately their purchasing choices. To address this issue, we propose and empirically test a choice model that incorporates reference-dependent fairness adjustments for both price and nonprice attributes within a random utility framework. The findings from two empirical studies using stated-preference choice experiments show that travelers engage in fairness-related reference point comparisons for price and other product attributes induced by RM and CCM. They offer additional evidence concerning the need to account comprehensively for attributes associated with both RM and CCM when predicting customer demand in travel and tourism firms. Accordingly, firms need to account not only for the effects of RM and CCM attributes, but also for the corresponding reference-dependent fairness adjustments relating to those attributes.

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Introduction

Service firms with fixed capacities, in particular airlines and hotels, face a double-challenge in maximizing revenues. To use their fixed perishable capacity units, they need to synchronize their revenue (or yield) management and their customer-centric marketing activities. Revenue management (RM) addresses revenue maximization by allocating perishable inventory units to existing demand using price discrimination (Kimes 2000). Customer-centric marketing (CCM) focuses, at the same time, on attaining profitable relationships with the firm's most lucrative customers to maximize lifetime values of current and potential customers (Rust, Lemon, and Zeithaml 2004; Vogt 2011). We use CCM as an umbrella term that comprises customer relationship management, loyalty programs, and other marketing efforts to build customer loyalty and increase the lifetime value of customers for the firm.

The contradictory nature of these two practices means that travelers often perceive service offerings as inconsistent. While the ensuing problems have often been neglected in the literature, more recent studies on revenue management address some of these issues. They specify, for example, inconsistent customer experiences, reduced loyalty, and perceived unfairness as some of the core issues (Wirtz et al. 2003; Noone, Kimes, and Renaghan 2003). For instance, members of frequent traveler programs (FTPs) offered by airlines and hotels often have difficulties redeeming award points for free flights (or hotel nights) and upgrades, even if seats or beds are still available for purchase. An ongoing poll on Webflyer.com reports that nearly half of all frequent flyer members could not redeem their points for a free flight, and only 59% succeeded in getting an upgrade. Airlines and hotels are reluctant to allocate a free capacity unit to an award booking if their yield management system indicates paying demand. This scenario is a typical example of concurrent, uncoordinated, and potentially conflicting CCM and RM. The pursuit of short-term revenue maximization objectives often results in failure to deliver promised benefits to presumably the most profitable customers.

Several authors have acknowledged the potentially detrimental effects and conflicting nature of coexisting RM and CCM. Shoemaker (2003) and Noone and colleagues (2003) both note that poorly used RM can damage customer loyalty and therefore advocate the integration of relationship marketing and RM. Kimes (1994), Kimes and Wirtz (2003), and Maxwell (2002) show that RM in general, and price discrimination in particular, alienates customers and creates perceived unfairness because customer expectations are not met. A "customer-relationship-management-level approach to revenue management, where availability controls are exerted at the individual customer level" (Talluri and van Ryzin 2004, p.30), can ease these tensions.

Dealing with the conflict between RM and CCM, however, remains a dazzling managerial problem that also requires theoretical deliberation. The fairness and justice literature (e.g., Baumol 1982; Konow 2003) and reference price research (e.g., Briesch et al. 1997; Kalyanaram and Winer 1995; Mazumdar and Papatla 2000) indicate that travelers perceive conflicts and inconsistencies associated with RM and CCM as unfair. Perceptions of (un)fairness affect customer decisions and pose the risk of decreased demand for a firm's offerings (Kahneman, Knetsch, and Thaler 1986).

The objectives of this article are thus to address the managerial problem of how to deal with potentially conflicting CCM and RM practices, and to contribute a choice model that allows capturing perceived unfairness in consumer choice. First, we assess how CCM and RM attributes influence customer purchasing choices. Second, we demonstrate how reference-dependent fairness adjustments, caused by these two marketing activities, affect customer purchase decisions. We do so by offering and testing an extension to basic choice models to capture such effects. We also show how FTP members, the main recipients of CCM activities, differ from nonmembers in their fairness adjustments and willingness to pay.

Theoretical Conceptualization and Hypotheses

Our conceptualization draws on a random utility framework (McFadden 1986) and assumes that travelers choose the option that gives them the highest utility. To capture how perceived unfairness alters customers' utility assessments, beyond the direct effects of product attributes, we extend the basic additive utility model with fairness adjustment components for each of the attributes that are affected by RM and CCM practices. These attribute-specific adjustments reflect the premise that travelers judge the fairness of an offer by comparing its performance with attribute-specific reference points. Such comparisons are made for price as well as for nonprice attributes. We consider reference points based on travelers' past personal experiences, knowledge obtained from other travelers and various media sources, other offers advertised at the time of choice, and the presentation of the offer as a gain or loss. Furthermore, we propose that not every deviation from an attribute-specific reference point has an equally profound effect on customer choice.

Modeling Travelers' Choice

Estimating the impact of simultaneous CCM and RM on purchase decisions requires understanding how customers evaluate travel offerings. The value that travelers perceive is their utility assessment of the alternative's attributes (Thaler 1980). Random utility theory (McFadden 1974, 1986) assumes that traveler *n* assesses the utility of all product alternatives *j* from a set of *j* = 1, 2, …, J alternatives and selects alternative *i* if and only if $U_{in} > U_{jn}$ $\forall$ $j \neq i$, where the utility the traveler derives from the purchase of this alternative is a linear function of product attributes $U_{nj} = v_{nj} + \varepsilon_{nj}$. In this equation, $v_{nj} = x'_{ni}\beta_i$ is the systematic component of the utility specification, and ε_{in} is an i.i.d. stochastic error term assumed to follow a Gumbel distribution. The probability that traveler *n* chooses alternative *i* is therefore

$P_{in} = P[(\varepsilon_{jn} - \varepsilon_{in}) < (v_{in} - v_{jn})]$, $j \neq i$. In McFadden's (1974) multinomial logit (MNL) model, the log of the odds of choosing one alternative over another alternative is equal to the utility difference of the two alternatives. Therefore, the MNL model is a difference-in-attribute model with a vector of generic parameters, $\beta_{i.}$

Yet not all travelers select in all situations the alternative associated with the assumed highest utility according to the predictions of standard model specifications, which are based on expected utility theory. Their purchase decisions reflect choice theories that account for the importance of expectations and their ensuing reference points (Sebora and Cornwall 1995; Thaler 1980). Kahneman and Tversky's (1979) prospect theory and the more general reference-dependent preference theory (Munro and Sugden 2003; Tversky and Kahneman 1991) imply that people evaluate outcomes relative to a neutral reference point, such that an editing or coding phase precedes actual evaluation and choice.

We propose that travel and tourism firms applying RM and its associated price discrimination practices run the risk of having their offerings negatively edited as a result of travelers' perceptions of unfairness (Kimes and Wirtz 2003). Fairness refers to a judgment that an outcome and/or the process to arrive at the outcome is reasonable, acceptable, and just (Bolton, Warlop, and Alba 2003; Xia, Monroe, and Cox 2004). Although subjective, fairness judgments are always comparative to a standard or reference point and are rule-based (Kahneman, Knetsch, and Thaler 1986; Xia, Monroe, and Cox 2004). Luce, Payne and Bettman (1999) support our conceptualization by noting that fairness issues can trigger emotional processes and recommending the use of reference point effects to capture the emotional trade-off difficulty hypothesis. This is consistent with the view of Lind (2002) who treats fairness judgments as a cognitive process. Indeed, fairness can explain a large part of the deviation from objective utility maximization (Konow 2003). As Kahneman et al. (1986)

show, perceived unfairness encourages people to defect, and customers even incur extra costs to avoid unfairness.

Following reference-dependent preference theory, we posit that travelers assess overall utility by combining an attribute component and reference-dependent component; similarly, Thaler (1985) distinguishes the acquisition utility derived from actual consumption of a product and reference-dependent transaction utility based on the merits of the deal. We therefore posit

$$v_{ni} = \beta_{1ni} X_{ni} + \beta_{2ni} FA_{ni}, \qquad (1)$$

where X_{ni} is (1 × k) vector of the k price and product/service attributes x_{nik} that describe alternative i and are influenced by CCM or RM; β_{1ni} is a (k × 1) vector of preference parameters; FA_{ni} is a (1 × k) vector that captures the utility changes created by fairness-based coding of attributes x_{ni}; and β_{2ni} is a (k × 1) vector of response parameters. Modeling reference-dependent fairness components as being attribute-specific is based on adaptation level theory and Thaler's (1985) segregation-aggregation hypothesis. According to adaptation level theory (Helson 1948), customers have a point of neutral response for each separate perceptual element. Because customers form separate reference levels and decision frames for each product attribute (Janiszewski, Silk, and Cooke 2003; Biehal and Chakravarti 1986), we apply the logic that has been used in reference price research to model reference points for all (price and nonprice) attributes that characterize an offering. Hardie, Johnson and Fader (1993) have adopted a similar approach in evaluating reference points for price and quality. Accordingly, when modeling the impact of RM and CCM, we assume that customers form separate reference points and fairness judgments for each RM and CCM attribute. We summarize the logic of our extension to the basic utility model with the following hypothesis:

H1: Attribute-specific reference-dependent fairness judgments for RM and CCM attributes adjust travelers' choices.

Reference-dependent Adjustments

Reference-dependent adjustments depend on both the direction of, and extent to which, an observed attribute level differs from its respective reference point. Individuals assess outcomes as either gains or losses and react more strongly to perceived losses than to perceived gains (Kahneman and Tversky 1979). Reference price studies confirm this pattern; customers respond more to price increases than to price decreases relative to their reference prices (Kalyanaram and Winer 1995). In accordance with loss aversion, we therefore expect travelers to prefer advantageous over disadvantageous deviations and derive two separate terms for positive (fairness gains) and negative (fairness losses) deviations, labeled Fairness Model Ia:

$$v_{ni} = \sum_k \beta_{1nik} X_{nik} + \sum_k \beta_{2nik} FAGAIN_{nik} + \sum_k \beta_{3nik} FALOSS_{nik} \,, \qquad (2)$$

where $\beta_{2nik}FAGAIN_{nik}$ and $\beta_{3nik}FALOSS_{nik}$ capture the utility changes created by positive or negative deviations, respectively, of the k attributes relative to their reference points, $\bar{x}_{nk}$. In addition,

$$\mathrm{FAGAIN}_{nik} = \min\{(x_{nik} - \bar{x}_{nk});0\} \text{ and } \mathrm{FALOSS}_{nik} = \max\{(x_{nik} - \bar{x}_{nk});0\} \; \forall k = 1, \text{ and}$$
$$\mathrm{FAGAIN}_{nik} = \max\{(x_{nik} - \bar{x}_{nk});0\} \text{ and } \mathrm{FALOSS}_{nik} = \min\{(x_{nik} - \bar{x}_{nk});0\} \; \forall k \neq 1, \qquad (3)$$

where k = 1 denotes the price attribute, and nonprice attributes are rank-ordered by ascending appeal. The principle of loss aversion stipulates that the magnitude and direction of the expected fairness adjustments for RM and CCM should conform to the following rules:

H2: A positive (negative) deviation of a RM or CCM attribute level from the reference point leads to a positive (negative) adjustment in utility.

H3: The relative size of a negative utility adjustment is greater than the relative size of a positive adjustment, given equal absolute deviations from the reference point.

Determinants of Reference Points for CCM and RM Attributes

The literature on preferences given a certain reference point is extensive, but far less has been done to identify the determinants of these reference points. Notable exceptions are Munro and Sugden (2003), and Kimes and Wirtz (2003) who model an individual's reference point as his or her recent, rational expectations about outcomes. Although existing research concerning reference-dependent effects on customer choice mainly considers price, we apply the same mechanisms to product attributes other than price. In research into the effects of known reference prices and their determinants, Bolton et al. (2003) argue that reference points reflect past prices, competitor prices and vendor costs, while Kahneman et al. (1986) find that market prices, posted prices and the history of previous transactions serve as reference prices. Generally customers use both internal and external reference prices, in line with adaptation-level theory, such that both past and present experiences define the level of a neutral response (Erdem, Mayhem, and Sun 2001; Kalyanaram and Winer 1995; Mazumdar and Papatla 1995). Internal (or temporal) reference prices are based on previous experiences with a brand and/or product category, and past exposure to other price information. Briesch et al. (1997) consider a brand's past prices as the best inputs to operationalize internal reference prices. External (or contextual) reference prices, such as publicized list prices, usually at the time of purchase, can also be manipulated through marketing communication to make customers perceive a price as a gain (Biswas and Blair 1991).

The fairness and justice literature further explains the formation of travelers' reference points. Equity theory, and the concept of distributive justice, substantiate that travelers consider their own past experiences and those of comparable others to assess whether outcomes are equitable (Xia, Monroe, and Cox 2004). Accordingly, travelers are assumed to have RM- and CCM-specific standards against which they compare the actual offering and its equity, which affect fairness perceptions of the offering. Besides, interactional or transactional justice refers to fairness judgments of interpersonal treatment, including issues of asymmetrical power and trust (Bolton, Warlop, and Alba 2003; Huppertz, Arenson, and Evans 1978). Accordingly, travelers use their transactions over time and other customers' transactions to assess an offering.

We summarize the determinants of reference points from existing research as four concepts, such that the reference points for any CCM or RM attribute are a function of (1) past personal experiences X_{exp}; (2) indirect knowledge of past experiences from peers, promotional messages, media, word of mouth, and so on, X_{know}; (3) contextual offerings at the time of purchase X_{cont}; and (4) the semantic presentation of the price variable as a percentage gain or loss relative to a suggested standard rate X_{stand}. We distinguish between experienced and observed temporal reference points, because customers' memory of chosen relative to observed options can be particularly strong (Briesch et al. 1997), and RM makes many different price–product bundles available at any given point in time.

Following Rajendran and Tellis (1994), we suggest that customers can integrate the four reference point components into their utility assessment in two ways. First, they can evaluate attribute levels relative to a single reference point $\bar{x}_{nk}$, which is a latent construct[i], formed by indicators of the four determinant constructs (Bollen and Lennox 1991) (Fairness Model Ia). Second, customers can make independent comparisons of each reference point component, which would enter the utility function as separate comparison terms (Fairness Model IIa). Theoretically, the two approaches are equally valid, although Rajendran and Tellis (1994) emphasize that the latter allows the investigation of the specific role of different reference point components. We assess both approaches empirically. If modeling customer choice with separate reference point components is superior to a single reference point per attribute, the effect of X_{exp} should be largest, followed by X_{cont}, and the indirect X_{know} effect should have the smallest effect.

Weighting Deviations

Not all fairness judgments based on the difference between actual and reference attribute levels may matter equally. Assimilation contrast theory and reference price research both find zones of indifference or latitudes of acceptance (Kalyanaram and Little 1994; Kalyanaram and Winer 1995). We argue that not all deviations from reference points have the same bearing on traveler choice; rather, the influence depends on several factors. Accordingly, instead of modeling reference points as a range, we introduce a weighting factor that reflects the importance of a deviation. The fairness effect of a deviation of any size can be discounted, depending on the size of the importance weight, which reflects the assumption that the ratio of an acceptable range to the reference point can be represented by a constant of proportionality ($\Delta P/P = K$) (Monroe 1973). We rewrite it as $\Delta P = K * P$. The value of ΔP is unknown, and K can be approximated with an importance weight w_{njk}.

Three factors determine the importance weight. First, the dispersion of past experiences influences the importance of a deviation. According to Monroe and Lee (1999), the width of an acceptable range reflects a customer's confidence in the value of a certain product attribute. Consistent and frequent experiences with a product category or supplier increase confidence and lead to more rigid and narrow reference points (Burton and Babin 1989). This is in line with the argument that perceived unfairness increases with the closeness and frequency of transactions (Huppertz, Arenson, and Evans 1978), as per interactional justice theory.

Second, expectations about future developments of prices and other product attributes likely affect reactions to a deviation from a current reference point (Kalyanaram and Winer 1995). Chen and Schwartz (2008), for example, found that expectations about the availability of better future rates change over time. Because RM causes offerings and their availability to change constantly, travelers' expectations about whether a similar or better offer is likely to be available in the near future may abate the impact of such deviations.

Third, the information a firm provides to justify its variable pricing and the availability and conditions of special offers, as well as attribution of these practices to the firm, change the magnitude of (un)fairness perceptions. Providing full or partial information improves fairness perceptions (Choi and Mattila 2006), and background information about the cost of providing a service influences price-based fairness perception (Schwer and Daneshvary 1997). Distributive justice and equity theory imply that seemingly unequal and hence unfair offerings can be justified (Xia, Monroe, and Cox 2004). Procedural justice, which rests upon the principle of dual entitlement and attribution theory (Kahneman, Knetsch, and Thaler 1986; Maxwell 2002), also suggests that knowledge of how an outcome resulted has an effect on perceptions of this offering (Kimes and Wirtz 2003). Only price increases resulting from cost increases are perceived as fair, any deviation from this rule is attributed to the service provider unless evidence indicates otherwise (Xia, Monroe, and Cox 2004). Therefore, we assert

$$w_{nik} = \beta_1 * x_{just\ nk} + \beta_2 * x_{avail\ nik} + \beta_3 * x_{range\ nk,} + \varepsilon_{nik}, \qquad (4)$$

where $x_{just\ nk} \in [0;1]$ is the level of justification for availability, price, and other product attributes; $x_{avail\ nik} \in [0;1]$ is the probability that customer *n* expects the same or better alternatives to be available at t + 1; and $x_{range\ nk,} \in [0;1]$ is the dispersion of past reference levels. By applying importance weightings, we revise Equation 3 as follows, resulting in Fairness Models Ib and IIb:

$$\mathrm{FAGAIN}_{nik} = \min\left\{ w_{nik} * (x_{nik} - \bar{x}_{nk}); 0 \right\}, \text{ and}$$
$$\mathrm{FALOSS}_{nik} = \max\left\{ w_{nik} * (x_{nik} - \bar{x}_{nk}); 0 \right\} \; \forall k = 1 \quad (5)$$

We summarize the role of attribute-specific importance weights in traveler's fairness judgments:

H4: Travelers' responses to reference point deviations are weaker (stronger) when their individual attribute-specific importance weights are smaller (larger).

Choices of Frequent Traveler Program Members

Perceptions of unfairness are most likely for members of FTPs, the primary recipients of CCM efforts. Regarding reference point formation and the importance of reference-dependent fairness adjustments, Rajendran and Tellis (1994) find that past personal purchase experiences matter most for travelers with extensive purchase histories and higher brand loyalty, such as the frequent traveler members in our study. In contrast, Mazumdar and Papatla (2000) indicate that more loyal customers use contextual reference prices for their preferred brands, whereas less loyal customers rely on their memory of past personal experiences. However, perceived unfairness may increase with the closeness and frequency of transactions, because reference points become more robust. Huppertz and colleagues (1978) also show that customers find inequity particularly unfair in high frequency shopping situations. This reaction may be more profound for members of FTPs, with their constant exposure to CCM promises and likely higher purchase frequencies (Lacey, Suh, and Morgan 2007). FTP members have firmer reference points for CCM-based promises and contrasting RM consequences than occasional travelers have. We thus predict:

H5: Fairness adjustments are greater for FTP members than for nonmembers, given the same magnitude of deviation from a reference point.

We also investigate willingness to pay for RM and CCM attributes and compare supposedly more profitable frequent traveler members against nonmembers. Participation in a loyalty program relates positively to relationship duration (Reinartz and Kumar 2003), with a weak but continuous link to profitability (Reichheld and Teal 1996). However, the frequently cited willingness of loyal customers to pay a price premium for their preferred brand has been challenged (Cox 2001; Xia, Monroe, and Cox 2004). We thus hypothesize:

H6: FTP members' willingness to pay for service attributes and the affiliated brand is lower than that of nonmembers.

Empirical Application

In light of the widespread and concurrent use of CCM and RM in the airline and hotel industries, we tested our hypotheses using data from these two industries. We analyzed choice concerning flight/hotel options using McFadden's (1986) MNL model.

Our data collection encompassed both qualitative and quantitative stages. In the qualitative stage, we conducted five focus group sessions with 35 airline passengers and 19 hotel guests to operationalize RM and CCM, by specifying the attributes and attribute levels that influence customer choice. The semi-structured focus groups concentrated on the most common RM manifestations (Kimes 1989; Weatherford and Bodily 1992) and the loyalty program features of relevant airline and hotel FTPs. Participants singled out five RM attributes (price, routing, cancellation, payment terms, availability) and four CCM attributes (free flights/stays, membership fees, validity of points, upgrades).

The quantitative study was administered online. The first section included a set of survey questions about travel experience and FTP membership, and about the best, average, and worst personal experiences and indirect knowledge about CCM and RM attributes for each brand included in the subsequent stated preference choice experiment (Crouch and Louviere 2004). The specific travel context for the experiment was a flight to Bangkok from one of three Australian cities (Sydney, Melbourne or Brisbane)[ii] or a hotel stay in Sydney or Melbourne. An optimal-design stated preference choice experiment (Street, Burgess, and Louviere 2005) with four generic choice alternatives was constructed using a 32-profile orthogonal main effects design as the starting design. The five RM and four CCM attributes identified in the qualitative stage, plus a FTP (brand) attribute and an attribute capturing the future availability of the alternative (x_{avail}), formed the $4^7 \times 2^3$ complete factorial design from which the starting design was derived.[iii] To control for possible order effects, choice profiles appeared in random order. Respondents chose their most preferred alternative for a flight to Bangkok (hotel stay in Sydney or Melbourne) from each choice set. The within-subject design was nested within a $2^3 + 2^4$ full factorial between-subjects design, leading to 24 different variations. Up to five factors were manipulated between subjects in both experiments: whether each choice set included two additional unavailable alternatives[iv] (context, x_{cont}); whether price was displayed as a dollar amount only or as a dollar amount and percentage discount/surcharge compared with the standard rate (semantic presentation, x_{stand}); whether respondents received an explanation for why prices and availability might vary (justification x_{just}); whether the scenario was a leisure or business trip (trip purpose); and, for business trips, whether the company paid for travel costs upfront or reimbursed the traveler for expenses later (payment method). Figure 1 shows a sample choice set.

We obtained 911 valid responses[v] (465 airline, 446 hotel) from a sample of 6,110 randomly selected members from a panel of people living in the eastern part of Australia who travel for work and/or leisure. They were offered a small cash incentive to complete the survey. Respondents were screened to limit the sample to those who have traveled at least once during the last 12 months and to ensure an equal split of FTP members and nonmembers in both studies. The response rate was 32.7%; however 797 respondents were screened out due to insufficient recent travel experience, 221 did not complete the survey, and 67 had to be excluded due to invalid responses, resulting in a usable response rate of 14.9%[vi].

Results

If fairness affects customer choices, adding fairness adjustments will better explain choices (Hypothesis 1). We therefore estimated baseline and fairness models, employing gain and loss terms for each service product attribute (Fairness Model Ia), as well as separate parameters for experience, knowledge, and context-based fairness adjustments for each product/service attribute (Fairness Model IIa). We also tested whether our proposed importance weight improves the models (Hypothesis 4; Fairness Models Ib and IIb).

According to the goodness-of-fit statistics of the five models in Table 1, Hypothesis 1 is well supported. The log-likelihood ratio tests (LLRT) are significant ($p < .01$). Unweighted adjustments (Fairness Models Ia and IIa) are consistently superior to weighted adjustments (Fairness Models Ib and IIb) against the predictions of Hypothesis 4, and Fairness Model Ia fits the data best for both studies. We thus base the remainder of our data analysis on Fairness Model Ia.

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The comparatively low pseudo-R^2 values in Fairness Model Ia across both studies suggest preference heterogeneity. To account for observed preference heterogeneity, we grouped respondents *a priori* on the basis of socio-demographic variables, travel-related variables, and experimental information conditions to assess differences in model fit (Salomon and Ben-Akiva 1983). However, this approach did not yield a significant improvement, which implies unobserved preference heterogeneity. As travelers seem to differ in their preferences and susceptibility to perceived (un)fairness, we adopted latent class segmentation analysis to simultaneously estimate choice probabilities and latent segment membership probabilities (Boxall and Adamowicz 2002; Swait 1994), with latent class membership determined by a respondent's utilities (Desarbo, Ramaswamy, and Cohen 1995; Verma et al. 2001).Following Swait (1994), we used our judgment and the parsimony argument to select the best segment solution, according to the BIC, AIC, and McFadden's pseudo R^2. In both studies, three segments provide the best solution, with a pseudo R^2 of 0.2967 for the airline study and 0.2505 for the hotel study.

For the airline study, segment membership is dependent on some travel-related variables, but except for trip purpose and payment method, the experimental conditions showed no difference. Segment 1 (Premium All-Purpose Travelers) contains respondents from both the leisure and business travel scenario who are either premium-level frequent flyers or nonmembers. In Segment 2 (Loyal Leisure Travelers) respondents tend to belong to only one frequent flyer program and are predominantly from the leisure travel scenario. Lastly, Segment 3 (Business Travelers) is mainly associated with the business scenario and lower loyalty because respondents generally belong to two or more FTPs at entry level.

In the hotel data, respondents in Segment 1 (All-purpose travelers) have the most extensive travel experience and premium FTP membership, and are equally split between the leisure and business scenario. Segment 2 (Leisure Travelers) travels least frequently and mainly for leisure purposes, and are typically not FTP members. Respondents belong to either the leisure travel scenario or the business travel scenario where travel expenses will be reimbursed. Segment 3 (Business Travelers) is similar to Segment 1 in that respondents also travel for both business and leisure, but the emphasis is slightly more on work-related travel, and they are most likely to be base-level FTP members. The majority of respondents in Segment 3 received a business trip scenario, and no justification of rate and availability variations.

To test Hypothesis 1 further, we compared model fit and preference estimates before and after adding the 16 fairness components for each of the three latent segments in each study. Including fairness components consistently improves the model fit in each segment, and all LLRT in both studies are significant ($p < 0.05$), with chi-square values from 30.69 to 2376.20.

To understand the extent of the change in preference estimates for CCM and RM attributes with the inclusion of the fairness terms, we performed a series of Wald linear hypothesis tests (Hensher, Rose, and Greene 2005). In the airline study, adding fairness adjustments significantly changed 21 (of 57) attribute preference estimates, compared to 11 (of 57) in the hotel study, and there are no consistent changes across segments. Fairness adjustments hence appear to contain some new information that customers' preference estimates for CCM and RM attributes cannot capture consistently.

CCM and RM Attributes

We estimate customer preferences using discrete choice models, which are relative to a scale factor (Salisbury and Feinberg 2010; Swait and Louviere 1993). We used the recommended full information maximum likelihood approach to estimate the scale factors for each segment and conducted Swait and Louviere's (1993) scaling test, which was significant in both studies (airline: chi-square = 3961.1550, df = 68, $p = 0.0000$; hotel: chi-square = 2924.1624, df = 68, $p = 0.0000$). Hence, the true parameter estimates differ across segments, even after controlling for differences in scale factors. We display the utility function parameters β_{nks} for the three-segment models in Table 2 (airlines) and Table 3 (hotels).

All attributes, with the exception of award flights/stays, have significant main effects and therefore influence choices in at least one segment. As expected, rate fences (routing/location, cancellation, payment) have negative utility effects (Wirtz and Kimes 2007). There are differences in price sensitivity across segments, likely due to the differences in travel frequency and trip purposes. Especially among the more price-sensitive leisure customers (Segments 2), the trade-off for booking restrictions does not seem well understood.

INSERT TABLES 2 & 3 ABOUT HERE

Reference-dependent Fairness Effects

The parameter estimates of the fairness adjustments are mostly significant and show the correct sign (Hypotheses 1 and 2). In the airline study, negative coefficients for price gain and loss terms across all three segments confirm reference price research and support Hypothesis 1 for the price attribute. Price-related fairness adjustments also reflect a segment's price sensitivity, such that Segment 2 reacts most strongly to price gains and losses, followed by Segment 3. In the hotel study, however, the gain and loss adjustment terms for price are not significant, except for the loss term for Segment 2. This finding may reflect the small price parameters for Segments 1 and 3, which indicate low price sensitivity[vii], or be a result of how data on past price experiences and price knowledge was collected. To avoid overestimating the effects of price-related fairness adjustments, the lowest price category in the survey section of the hotel study was specified as "up to $175." Thus, reference prices for respondents with knowledge and experience mainly below $175 are conservative estimates that are higher than real unobserved reference prices, which may deflate fairness adjustments.

In both studies, we find partial support for Hypotheses 1 and 2 in terms of fairness adjustments for nonprice attributes. In the airline study, with the exception of free flights, upgrades, gains regarding ticketing and fees, fairness components have significant coefficients and correct signs in at least one segment. In the hotel study, fewer fairness adjustment terms overall showed significant preference estimates. However, most coefficients are positive as expected (see Tables 2 and 3); the negative sign of routing/location gains is attributed to itinerary planning.

We also tested whether losses have a stronger effect on utility than gains of the same size (Hypothesis 3) by statistically comparing the differences in preference estimates across the matching pairs of gains and losses for each attribute with a series of Wald linear hypothesis tests. The simultaneous test of all matching pairs for the airline data was significant ($p < 0.01$) in Segments 1 and 3, and marginally significant in Segment 2 ($p < 0.10$). For the hotel data, the simultaneous test was significant in Segments 2 and 3 ($p < 0.05$). We thus conclude that gain and loss terms differ in their effects on customer choice, with losses generally weighing larger than gains ($p < 0.05$). For airlines, this applies to price, routing, program fees, and cancellation, and price, location, and ticketing for hotels.

Differences between FTP Members and Nonmembers

If FTP members react more strongly to fairness issues because of the salience of the contradictory nature of CCM and RM (Hypothesis 5), we should find more and larger fairness effects for members compared with nonmembers. Because the latent segments are confounded with respondents' frequent flyer status, we estimated separate MNL models for member and nonmember subsamples.

The analysis of the airline data reveals only minor differences for the two groups, with slightly fewer significant ($p < 0.05$) reference-dependent fairness adjustment coefficients with the correct sign in the nonmember group. The gain and loss terms for price and routing are significant across both groups and consistently larger for members ($p < 0.01$). Members demonstrate their susceptibility to fairness issues with significant terms for losses regarding ticketing, cancellations, and fees, as well as significant gain and loss coefficients for upgrades, unlike nonmembers. Hypothesis 5 has therefore partial support in the airline study.

The hotel data show similar patterns for hotel FTP members and nonmembers. The magnitude of fairness effects is slightly larger for nonmembers ($p < 0.01$) when significant coefficients for both groups allow comparison, but only FTP members make positive and negative fairness adjustments for membership fees. For the most part, Hypothesis 5 cannot be supported for the hotel study.

Finally, we tested members and nonmembers with regard to their willingness to pay (WTP) for both a particular brand/program and the product attributes induced by CCM and RM (Hypothesis 6). To obtain the WTP estimates, we calculated the ratio of an attribute preference estimate and the price coefficient where both coefficients are statistically significant (Hensher, Rose, and Greene 2005). Members tend to have a lower WTP for the same product feature than do nonmembers, with the exceptions of cancellations, changes, and ad hoc upgrades (Table 4).

INSERT TABLE 4 ABOUT HERE

Regarding WTP to stay with "their" program, members of Oneworld and Star Alliance programs, compared with nonmembers and members of other programs, would pay a price premium to book a flight within their program. The WTP of Oneworld members for a Oneworld flight is $263.28, compared with $18.89 for nonmembers. Star Alliance members would pay a $214.67 premium for a Star Alliance flight, compared with $25.23 for nonmembers. This brand effect is not present for Velocity members, perhaps because only

37% of Velocity members exclusively belong to that rewards program, as opposed to 64% and 48% for Oneworld and Star Alliance, respectively.

The WTP patterns in the hotel study (Table 5) demonstrate that FTP members are not prepared to pay a higher price than nonmembers for any CCM or RM attributes, or to stay within their FTP hotel group. The lack of significant WTP effects likely reflects the high fragmentation of the hotel industry, indicated by the 44% of surveyed hotel FTP members who belong to a program other than those we chose for this study, which were the four largest programs in Australia.

INSERT TABLES 5 & 6 ABOUT HERE

Discussion

Key Findings for the Simultaneous Use of CCM and RM

For managers of travel and tourism firms with fixed capacities, who aim to maximize revenues in the short and long terms, this study offers important leverage points to improve their CCM practices to avoid conflicts with RM. Our results offer insights into price sensitivity and WTP patterns, which form the basis of price discrimination. In the airline study, for example, the price sensitivity of reimbursed business travelers is comparable to that of leisure travelers, whereas other business travelers are much less price-sensitive. Thaler's (1985) segregation–integration reasoning implies that losses are accumulated and considered jointly, whereas gains are perceived separately. Paying business travel expenses is initially a loss, which, integrated with a slight gain from reimbursement, still results in an overall loss.

We find that FTP members do not have a higher WTP for RM and CCM attributes, with two exceptions. Airline FTP members expect a smaller discount for a non-refundable fee and are prepared to pay more than nonmembers for a flight if the program offers ad hoc upgrades at check-in. FTP members may have learned they are the most likely beneficiaries of such courtesies. The results also show that airline passengers will pay a price premium to book within their program, despite Weber's (2005) finding that the ability to earn frequent flyer points within an alliance is less important than assumed. Hotel FTP members do not differ in their brand WTP, which is in accordance with research by Cox and colleagues (Cox 2001; Xia, Monroe, and Cox 2004) that price discrimination should not disadvantage frequent travelers.

Travelers are expected to understand the trade-off between higher booking restrictions and lower rates, which is inherent to RM. The effect of non-physical rate fences, such as booking restrictions, on perceived fairness is alleviated when customers are familiar with the practice (Wirtz and Kimes 2007). But our findings reveal that the link between rate fences and differential rates is not well reflected in customer choices. In the airline study, for example, the highly price-sensitive Segment 2 is also the most finicky customer group and penalizes airlines for stricter booking conditions. This disconcerting result challenges the basic RM practice of tying lower rates to restrictions as artificial rate fences to justify different prices (Kimes and Wirtz 2003). To avoid unfairness perceptions, hotels and airlines need to explicitly articulate this trade-off between cheaper rates and less favorable booking conditions, as well as to prevent utility decreases from booking restrictions below travelers' reference points.

FTPs are a tangible implementation of CCM. Particularly in the airline study, though, their appropriateness for acquiring high lifetime value customers is challenged. Some customers with high travel frequency exhibit choice behavior similar to that of premium-level frequent flyers but have not joined any frequent flyer programs, because membership fees and restricted access to membership benefits have deterred them (Segment 1). Airlines might be alienating a profitable customer segment, with an above-average WTP to book with their airline alliance, with conditions that are aimed at establishing entry barriers to less profitable, infrequent travelers without an attractive lifetime value.

With regard to CCM attributes, we find that the conditions for claiming free award bookings do not significantly influence customer choices, even though our focus group research indicated that most FTP members experienced problems with booking free awards (Whyte 2004). Perhaps travelers have become so accustomed to the lack of capacities for award bookings that it no longer influences their purchasing choice. Ongoing research should monitor whether the practices of more recent programs that promise award bookings with “no blackout dates” and “any seat” will change this effect over time.

Two basic avenues for action emerge from the importance of reference-dependent fairness judgments: Travel and tourism firms can (1) shape attributes to meet customers’ reference points or (2) alter the reference points. Both approaches require firms to acquire knowledge about customers’ reference points, which is a key element of customer centricity (Shah et al. 2006). Data about customers’ past experiences with the travel firm, as well as the past and present offers of the firm and its competitors, should be considered. Research on the fairness effects of RM (Choi and Mattila 2004) recommends several ways to employ price discrimination without risking perceived unfairness, such as providing additional perceived value in return for higher prices, or obscuring the reference point with service bundles. These approaches take advantage of customers’ existing reference points. However, if travel firms want to alter reference points to their benefit, they cannot leverage all four reference point determinants with equal ease; they have, for example, little influence over competitors’ past and present offers and the past purchase experiences of their customers, particularly those with competitors. However, they can control the range of offers they advertise and manipulate the semantic presentation of an offering as a discount or surcharge.

Unfairness (losses) influences choices much more than fairness (gains). Achieving positive deviations from reference points requires additional cost, but probably cannot delight customers in a way that influences their choices favorably. Kim, Shi and Srinivasan (2004) encourage the use of loyalty programs to fill excess capacity during times of low demand, which means that award bookings are not available during peak times. This approach might be appropriate for casual customers, but it has negative effects on demand from premium loyalty members who will experience negative deviations, thus decreasing their likelihood of choice. Service firms therefore must decide whether the cost savings of performing below customers' reference points outweigh the potential loss of sales.

Implications for Decision-Making Theory

The results of both studies show that travelers' choices affected by perceived unfairness can be captured more completely by a choice model that includes reference-dependent utility judgments, in support of the core argument of prospect theory (Kahneman and Tversky 1979) and more general reference-dependent preference theory (Sugden 2003; Tversky and Kahneman 1991). We further contribute to decision-making theory by pooling well-established principles of justice theory with reference-dependent preference theory to incorporate fairness adjustments into a random utility framework rather than relying on self-stated fairness perceptions.

We also show that reference-dependent fairness adjustments occur for each product attribute, rather than a global fairness adjustment. Reference-dependent preferences mainly have been applied to price (Briesch et al. 1997; Winer 1989; Niedrich, Sharma, and Wedell 2001; Putler 1992; Kalyanaram and Winer 1995) and price effects are clearly visible in our study. Our contribution is an extension of reference-dependency to attributes other than price.

Conclusion

Our analyses document how simultaneously experienced CCM and RM attributes affect customer choices. We also developed and tested a model to show how perceived unfairness influences customer choice, lending support to reference-dependent preference theory as a means to explain fairness adjustments due to CCM and RM. To demonstrate the conflicting nature of CCM and RM, we also have established that FTP members are slightly more susceptible to fairness adjustments, compared with nonmembers, and do not necessarily have a higher WTP.

A limitation of our study relates to the cross sectional nature of the research design. Future research could use a longitudinal/panel design (Vogt 2011) to study the dynamics and temporal pattern of travelers' choices. Future research could also explore the robustness of our findings by including additional capacity-constrained service industries and consumption scenarios. Reference points may be recalculated using different determinants and estimation methods; our assumption of equally spaced qualitative attribute levels also affects the results. The potential issues associated with this necessary yet limiting assumption are most apparent in the results for the reference-dependent effect of cancellations and changes. A related issue is our use of data collected with a survey tool, rather than revealed preference data, to calculate reference points. Although reference points do not rely on objectively correct memories of past experiences, drawing on actual purchase histories and past and present purchase options might improve reference point calculations. In addition, future research may benefit from combining stated preference with revealed preference choice data (Hensher, Louviere, and Swait 1998). Finally, we only collected data about expectations and experiences with the particular trip scenario described in the experiments. Future research could explore the cross-effects of experiences with similar travel scenarios on reference point formation.

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Table 1. Model Fit Statistics

Model	No. of Parameters	Airline Study Log-Likelihood	Pseudo R^2	LLRT (df) *	Hotel Study Log-Likelihood	Pseudo R^2	LLRT (df)*	Chi² critical value (α=.01)
Baseline	19	-18400.348	0.1080		-17781.743	0.1013		
Fairness Ia	35	-17851.208	0.1346	1098.280 (16)	-17739.817	0.1034	83.852 (16)	32.00
Fairness Ib	35	-17904.91	0.1320	990.876 (16)	-17738.961	0.1034	85.564 (16)	32.00
Fairness IIa	43	-17809.041	0.1367	1182.614 (24)	-17739.753	0.1034	83.980 (24)	42.98
Fairness IIb	43	-17902.183	0.1321	996.330 (24)	-17754.702	0.1026	54.082 (16)	42.98

* Log-likelihood ratio test chi-square and degrees of freedom, relative to baseline model.

Table 2. Model Estimation Results: Preference Parameter Estimates for Airline Study

	Expected Sign	Segment 1: All-Purpose Travelers		Segment 2: Loyal Leisure Travelers		Segment 3: Business Travelers	
Segment size		**47.43%**		**35.99%**		**16.58%**	
Model		**Baseline**	**Fairness**	**Baseline**	**Fairness**	**Baseline**	**Fairness**
Attributes							
Price (AU$ 770, 990, 1210, 1430)	(-)	-0.066***	-0.037***	-0.760***	-0.593***	-0.198***	-0.164***
Routing (via_HK, 15hr)	(-)	-0.194***	-0.121***	-0.399***	-0.454***	-2.022***	-1.993***
Routing (via KL, 13hr)	(-)	-0.170***	-0.164***	-0.130***	-0.178***	-0.834***	-0.920***
Routing (via SIN, 11hr)	(-)	0.133***	0.093***	0.044	0.075*	0.110	-0.042
Routing (BASE – direct flight, 9hr)							
Cancellation (non-refundable)	(-)	-0.086***	-0.081***	-0.127***	-0.101***	-0.046	-0.054
Cancellation (BASE – 10% fee)							
Ticketing (within 24hr of booking)	(-)	0.021	0.004	-0.051#	0.006	0.124#	0.058
Ticketing (60 days prior to departure)	(-)	-0.001	-0.002	-0.064*	-0.079*	-0.256***	-0.246**
Ticketing (30 days prior to departure)	(+/-)	0.026	0.023	0.039	-0.002	-0.055	-0.020
Ticketing (BASE – 14 days prior)							
Frequent Flyer Program (Oneworld)	(+/-)	-0.041#	-0.041#	0.102***	0.155***	0.105	0.081
Frequent Flyer Program (Star Alliance)	(+/-)	0.038#	0.037#	0.027	0.057	0.172*	0.169*
Frequent Flyer Program (Velocity)	(+/-)	0.012	0.011	-0.033	-0.073*	-0.245**	-0.214*
F.F. Program (BASE – Skyteam)							
Free flights (limited award seats)	(-)	-0.034**	-0.024	-0.002	0.009	-0.014	0.010
Free flights (BASE – any seat)							
Membership fees ($50 fee)	(-)	-0.049***	-0.059**	-0.165***	-0.146***	-0.146**	0.006
Point Validity (2 years)	(-)	-0.012	-0.014	-0.083**	-0.149**	-0.106	-0.002
Point Validity (3 years)	(-)	-0.111***	-0.118***	0.050#	0.010	-0.188*	-0.072
Point Validity (buy one flight per year)	(+/-)	-0.055*	-0.048*	-0.025	0.013	0.108	0.107
Point Validity (BASE – no expiry)							
Upgrades (using points)	(-)	-0.083***	-0.103***	-0.141***	-0.086*	-0.026	0.108
Upgrades (ad hoc decision at check-in)	(+/-)	0.101***	0.099***	0.096***	0.073*	0.194**	0.241**
Upgrades (free for gold and above)	(+/-)	-0.031	-0.026	-0.004	-0.033	-0.031	-0.088
Upgrades (BASE – free for platinum)							
Fairness adjustments							
Price_gain	(-)		-0.042***		-0.496***		-0.101*
Price_loss	(-)		-0.048***		-0.626***		-0.102**
Routing_gain	(+)		-0.055		-0.035		-0.767***
Routing_loss	(+)		0.133***		0.184***		0.414**
Ticketing_gain	(+)		-0.036		0.043		0.093
Ticketing_loss	(+)		-0.015		-0.096*		-0.125
Cancellation_gain	(+)		-0.076#		0.059		0.136
Cancellation_loss	(+)		0.071#		0.090#		-0.198#
Flights_gain	(+)		0.017		-0.074		0.029
Flights_loss	(+)		0.006		-0.007		0.046
Fees_gain	(+)		-0.079		0.056		0.281
Fees_loss	(+)		0.212*		0.028		0.814**
Validity_gain	(+)		-0.009		-0.039		0.201*
Validity_loss	(+)		0.001		-0.053		-0.003
Upgrades_gain	(+)		-0.009		0.023		0.127
Upgrades_loss	(+)		-0.046		0.055		0.094

Note: # $p<0.1$; * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 3. Model Estimation Results: Preference Parameter Estimates for Hotel Study

	Expected Sign[1]	Segment 1: All-Purpose Travelers		Segment 2: Leisure Travelers		Segment 3: Business Travelers	
Segment size		**54.49%**		**25.45%**		**20.06%**	
Model		**Baseline**	**Fairness**	**Baseline**	**Fairness**	**Baseline**	**Fairness**
Attributes							
Price (AU$ 175, 225, 275, 325)	(-)	-0.117***	-0.179***	-3.004***	-2.785***	-0.772***	-0.648***
Location_next	(+)	0.167***	0.180***	0.814***	0.858***	2.453***	2.201***
Location_walk	(+)	0.161***	0.159***	0.441***	0.292***	0.855***	0.615***
Location_public	(-)	-0.155***	-0.162***	-0.345***	-0.434***	-1.514***	-1.467***
Location (BASE – drive)							
Cancellation (10% fee)	(+)	0.050***	0.050*	0.247***	0.226***	0.096***	0.116**
Cancellation (BASE – non-refundable)							
Payment_arrival	(+)	0.020	0.0330	0.245***	0.242***	0.146**	0.192*
Payment_deposit	(+/-)	0.029	0.021	0.004	0.010	-0.038	-0.021
Payment_30days	(-)	0.047*	0.040#-	0.188***	-0.179***	-0.157**	-0.166**
Payment (BASE – within 24 hours)							
Loyalty Program IHG	(+/-)	0.065***	0.066***	-0.249***	-0.265***	-0.0190	-0.043
Loyalty Program Hilton	(+/-)	0.005	0.006	0.063	0.068	-0.007	0.024
Loyalty Program Marriott	(+/-)	-0.005	-0.005	0.126*	0.132*	0.198**	0.181*
Loyalty Program (BASE – Starwood)							
Free stays (any room)	(+)	0.022#	-0.009 -	0.026	-0.020	0.017	0.001
Free stays (BASE – award room)							
Membership fees ($50 fee)	(-)	-0.113***	-0.132***	-0.117***	-0.107**	-0.031	-0.089#
Point Validity_always	(+)	0.112***	0.144***	-0.023	-0.100	0.133*	0.031
Point Validity_purchase	(+/-)	-0.011	-0.005	0.087#	0.064	0.224***	0.208**
Point Validity_3yrs	(-)	-0.104***	-0.116***	0.044	0.061	-0.145*	-0.093
Point Validity (BASE – 2yrs)							
Upgrades_ad hoc	(-)	-0.007	-0.034	0.040	-0.014	0.009	-0.001
Upgrades_platinum	(+/-)	-0.01	-0.018	-0.071	-0.087#	-0.101#	-0.099#
Upgrades_gold	(+/-)	0.113***	0.124***	0.107*	0.127**	0.097#	0.107#
Upgrades (BASE – using points)							
Fairness adjustments							
Price_gain	(-)		0.076		-0.049		0.035
Price_loss	(-)		0.051		-0.628***		-0.309#
Location_gain	(+)		-0.017		-0.234**		-0.007
Location_loss	(+)		0.004		0.381***		0.542***
Ticketing_gain	(+)		-0.037		0.011		-0.032
Ticketing_loss	(+)		0.014		-0.007		-0.043
Cancellation_gain	(+)		0.033		-0.087		-0.117
Cancellation_loss	(+)		-0.012		0.079#		-0.011
Stays_gain	(+)		0.101*		-0.072		0.067
Stays_loss	(+)		0.040		0.003		0.033
Fees_gain	(-)		-0.139***		0.068		-0.109
Fees_loss	(-)		-0.104***		0.066		-0.164**
Validity_gain	(+)		-0.037		0.044		0.117
Validity_loss	(+)		-0.017		0.125#		0.046
Upgrades_gain	(+)		0.031		0.069		0.028
Upgrades_loss	(+)		0.024		0.067		-0.033

Note: # p<0.1; * p<0.05; ** p<0.01; *** p<0.001

[1] The expected signs for some coefficients differ from those in the airline study, due to reversed coding.

Table 4. WTP for Airline Attributes Depending on Frequent Flyer Status

Attribute	Nonmembers	Members
Routing_HK(15h)	-$429.65	-$962.77
Routing_KL(13h)	-$413.80	-$928.97
Routing_SIN(11h)	-$308.41	-$701.16
Cancellation & changes	-$113.93	-$66.82
Ticketing_24h	n.s.	-$81.15
Ticketing_60d	n.s.	n.s.
Ticketing_30d	n.s.	n.s.
Point Validity_2y	-$77.38	n.s.
Point Validity_3y	-$81.62	-$161.03
Point Validity_purchase	n.s.	n.s.
Upgrades_points	-$41.98	-$103.21
Upgrades_ad hoc	$11.37	$118.24
Upgrades_gold	-$32.86	-$68.57
Free flights	n.s.	n.s.
Membership fees	-$89.17	-$92.15

Table 5. WTP for Hotel Attributes Depending on Hotel Loyalty Program Status

	Nonmembers	Members
Number of observations	*27,648*	*29,440*
Location_next	$132.15	$134.32
Location_walk	$59.83	$59.66
Location_public	$2.45	-$4.87
Cancellation & changes	$32.19	$17.48
Payment_arrival	$34.00	$25.65
Payment_deposit	n.s.	n.s.
Payment_30days	n.s.	n.s.
Free stays_any room	-$9.70	n.s.
Membership fees ($50)	-$23.57	-$28.50
Point validity_always	$14.71	n.s.
Point validity_purchase	n.s.	n.s.
Point validity_3yrs	-$7.61	-$12.26
Upgrades_ad hoc	n.s.	n.s.
Upgrades_platinum	$1.65	n.s.
Upgrades_gold	$27.02	$22.53

Table 6. Summary of Hypotheses Testing

Hypothesis	**Airline Study**	**Hotel Study**
H 1	Supported	Supported
H 2	Partially supported	Partially supported
H 3	Supported	Supported
H 4	Not supported	Not supported
H 5	Partially supported	Partially supported
H 6	Supported	Not supported

Figure 1. Sample Choice Set

Review Instructions

Full Attribute Information	A	B	C	D
Price	$1200	$1400	$800	$1000
Routing and total travel time	via Singapore (11hr)	Direct	via Hong Kong (15hr)	via Kuala Lumpur (13hr)
Cancellation/Changes	10% fee	non-refundable	10% fee	non-refundable
Ticketing	within 24hr	60 days prior to departure	30 days prior to departure	14 days prior to departure
Future fare availability	70%	100%	10%	40%
Frequent flyer program	Star Alliance	Velocity	Skyteam	Oneworld
Award flights	if economy seats are available	if frequent traveller seats are available	if economy seats are available	if frequent traveller seats are available
Fees	No fees	$50 joining fee	No fees	$50 joining fee
Validity of Miles/Points	as long as one flight per year is purchased	points never expire	2 years	3 years
Upgrades	free for gold and above, if business class is still available	free for platinum and above, if business class is still available	in exchange for award points	ad-hoc decisions at check-in

Q1. Please choose your most preferred and your least preferred options from the available flights.

Most	○	○	○	○
Least	○	○	○	○

Q2. Out of the remaining two options, which flight would you prefer?

	○	○	○	○

Q3. Would you book your most preferred option from Q1 now?

Yes: ○ No: ○

Q4. If you are not already a member of this frequent flyer program, would you join when you make the booking?

Yes: ○ No: ○

Submit

[i] For the sake of computational simplicity, the latent reference point variable enters the choice model as a fixed effect. This two-stage limited information approach is theoretically as valid as a full information approach that accounts for measurement error (Ashok, Dillon, and Yuan 2002; Ben-Akiva et al. 2002).

[ii] Depending on the respondent's residence.

[iii] Tables 2 and 3 show three binary attributes, and six of the seven 4-level attributes, and their levels. The levels of x_{avail} are 10%, 40%, 70% and 100%.

[iv] The context alternatives were generated using the same approach as applied for the experimental design.

[v] The responses were representative and no biases were induced through non-responses and incomplete responses.

[vi] 25 and 42 responses respectively were outliers (i.e., the first alternative was consistently chosen across all 32 choice sets).

[vii] Although the magnitude of the hotel parameters seems comparable to those in the airline study, the size of the price parameters is influenced by the actual price levels, which are substantially lower in the hotel study.