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# A dynamic perspective on consumers' price fairness perception: Empirical evidence from the airline industry



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**Abstract:** This paper investigates the concept of perceived price fairness and its dynamic alteration along the customer buying cycle. Today, variable pricing is widespread in many service industries. Besides the current sales price, customers are extensively exposed to varying external reference prices (for example, advertised prices). Thus, this pricing practice risks being perceived as unfair at some stage along the purchasing process, and negative consumer reactions cannot be ruled out. However, previous research has adopted a quite static approach, which only offered an incomplete picture of

fairness perceptions with a specific service offer. To better capture the dynamics, this study conducted a scenario-based experiment with 459 airline customers encompassing repeated measures. The results provide evidence that the perception of distributive and procedural fairness significantly varies with the exposure to changing external reference prices along the buying cycle. Therefore, marketers should be cautious regarding price variations and advertised prices.

**Keywords:** perceived price fairness, external reference prices, customer buying cycle, revenue management, airline industry

**Eine dynamische Perspektive der Preisfairnesswahrnehmung von Kunden – Empirische Evidenz aus der Airline-Industrie**

**Zusammenfassung:** Der Beitrag untersucht das Konzept der Preisfairnesswahrnehmung von Kunden und deren dynamische Veränderung im Kaufprozess. Heutzutage sind variable Preise in vielen Dienstleistungsbranchen weit verbreitet. Neben dem aktuellen Verkaufspreis sind Kunden verstärkt einer Vielzahl von sich ändernden, externen Referenzpreisen (z. B. Werbepreise) ausgesetzt. Dadurch erhöht sich die Wahrscheinlichkeit, dass solche Preismodelle von Kunden in irgendeiner Phase des Kaufprozesses als unfair wahrgenommen und negative Kundenreaktionen nicht ausgeschlossen werden können. Allerdings hat die bisherige Forschung eher einen statischen Ansatz verfolgt, welcher nur ein unvollständiges Bild der Fairnesswahrnehmung einer spezifischen Dienstleistung wiedergibt. Um die Dynamik der Preisfairnesswahrnehmung besser zu erfassen, wurde in dieser Studie ein szenariobasiertes Experiment mit 459 Airline-Kunden entlang des Kaufprozesses durchgeführt. Die Ergebnisse zeigen, dass sich die Wahrnehmung von distributiver und prozeduraler Fairness signifikant verändern kann, wenn Kunden unterschiedlichen, sich verändernden externen Referenzpreisen im Kaufprozess ausgesetzt sind. Vor diesem Hintergrund sollten Unternehmen beim Einsatz von Preisvariationen und Werbepreisen vorsichtig sein.

**Stichworte:** Wahrgenommene Preisfairness, Externe Referenzpreise, Kaufprozess, Revenue Management, Airline-Industrie

## 1. Introduction

Recent generations of revenue management systems systematically vary prices between different consumption times or performance levels, and particularly according to the time of booking (Pompl 2002). Consequently, prices for the same product or service may vary considerably at different points along a potential buying cycle (for example, through price promotions posted in advertisements or prices revealed in conversations with co-consumers) (Kimes 2002). This is notable in many service industries such as airlines or rental car companies, where the act of purchasing or booking is often considerably distant from the moment of consumption (Hilke 1989; Shugan/Xie 2000). Thus, this prevalent service pricing practice risks being perceived as unfair at some stage along the purchasing process (Maxwell 1997; Kimes/Wirtz 2002; Hermann et al. 2003).

The (low-cost) airline industry is considered to be the most relevant field of research because (i) it displays the typical constitutional elements of services (Meffert/Bruhn 2003; Bieger 2007), (ii) its revenue management techniques are regarded as one of the most dynamic and sophisticated pricing strategies (McGill/Van Ryzin 1999; Lindenmeier 2005) and finally, (iii) its product is widely perceived as a commodity, implying that the price of an airfare is one of the most important choice criteria for customers along the buying cycle (Bieger et al. 2002; Pompl 2002; Friesen, 2008). According to previous findings, unfair pricing may lead to negative consumer reactions such as claiming financial compensation (Xia et al. 2004), searching for alternatives (Okun 1981; Kaufmann et al. 1991), switching to a different supplier, or spreading negative word-of-mouth (Kahneman et al. 1986a; Campbell 1999). Consequently, perceived price fairness is a highly relevant marketing issue for service firms, and has been found to influence willingness to purchase (Huppertz et al. 1978; Kalapurakal et al. 1991; Maxwell 2002), customer satisfaction (Herrmann et al. 2000; Huber et al. 2006), and is claimed to influence loyalty, and hence long-term profitability (Kahneman et al. 1986a; Kimes/Wirtz 2003; Maxwell 2002; 2005). Once established, several authors postulate that price fairness judgments change over time (Kamen/Toman 1970; Monroe 1982; McClintock/Keil 1982; Gabor 1988; Franciosi et al. 1995; Martins 1995; Bereby-Meyer/Grosskopf 2004; Bieger et al. 2005; Homburg/Koschate 2005b). However, previous empirical studies on price fairness lack a dynamic view and neglect the way perceived price fairness varies over time. (For an overview on previous price fairness research see Xia et al. 2004; Homburg/Koschate 2005a; 2005b).

To remedy these deficiencies in the literature, this paper explores changes in consumers' perception of price fairness along the buying cycle by empirically investigating the dynamic alterations of distributive and procedural price fairness induced by changing external reference prices. As a research setting, we chose airline revenue management pricing, mainly because sophisticated revenue management was introduced very early in this service industry (McGill/Van Ryzin 1999; Lindenmeier 2005), and most customers already have had a broad exposure to differing airline prices.

This paper addresses four major research gaps. First, previous empirical studies have applied a quite static approach in their measuring of the concept of price fairness either in the pre-consumption stage (see for example, Dickson/Kalapurakal 1994; Maxwell 2002; Vaidyanathan/Aggarwal 2003; Campbell 2007; Wirtz/Kimes 2007), or in the consumption

stage of the buying cycle (see for example, *Maxwell 1995; Kimes 2002; Fasciati/Bieger 2007*). However, empirical results on related constructs in behavioral pricing research (such as price satisfaction, price interest, and price image) show dynamic changes over time (for price satisfaction, see *Diller/That 1999; Diller 2002; Pohl 2004*; for price interest, see *Diller 1982*; for price image, see *Simon 1992*).

Second, previous research has mainly focused on the distributive fairness of prices (see for example, *Huppertz et al. 1978; Urbany et al. 1989; Darke/Dahl 2003; Vaidyanathan/Aggarwal 2003; Bolton et al. 2003*). Therefore, this paper considers the notion of procedural fairness by introducing the concept of price system fairness. The literature review contains more detail on this subject.

Third, price fairness has been extensively researched in consumer goods industries (with the exception of *Urbany et al. 1989; Boyd/Bhat 1998*) while widely neglecting the service context (for an overview, see *Homburg/Koschate 2005a; 2005b*). With the empirical investigation of airline pricing, we intend to add to this research gap.

Fourth, most previous empirical studies employ price increase scenarios to study price fairness issues (*Homburg/Koschate 2005a; Campbell 2007*). This study builds on revenue management pricing, and thus includes both alternating price increase and decrease scenarios.

Thus, the degree of empirical and practical novelty of this paper is constituted by both, filling in major empirical research gaps and testing our hypotheses in a scenario-based experiment with customers of European low-cost airlines as the most relevant field of research.

## 2. Literature Review

### 2.1 An interdisciplinary View on the Concept of Fairness and its Dimensionality

The concept of “fairness” is of vital interest in various research disciplines, including philosophy, socio-psychology, and economics. In philosophy, the discussion on the notion of fairness as a moral concept has persisted for centuries (*Hume 1740*). Fairness is considered an integral element of social justice, consisting of two inseparable components: distributive and procedural justice (*Rawls 2001; Rescher 2002*). Taking a socio-psychological perspective, fairness is commonly linked to exchange relations (see *Thibaut/Kelley 1959; Homans 1961; Adams 1963; Deutsch 1975*). It is also understood as a concept consisting of distributional justice, as emphasized in the equity theory (*Homans 1961*); and procedural justice, for example, as expressed in research based on the principle of dual entitlement (*Kahneman et al. 1986a; 1986b*). While the equity theory suggests that fairness is assessed in reference to the proportion of an input-output ratio (that is, an investment-reward ratio) between two transaction parties (*Martins/Monroe 1994*), in the principle of dual entitlement, fairness is benchmarked against an entire reference transaction (*Kahneman et al. 1986a*). Research on the principle of dual entitlement proposes that a price increase resulting from an increase in costs is perceived as fair; whereas when it comes about because of an increase in market power (for example, in the case of excess demand), it is perceived as unfair (*Kahneman et al. 1986a; Tarrahi et al. 2016*).

The first systematic observation of fairness considerations in the field of behavioral pricing revealed that consumers have a clear picture about what they perceive as a fair price (*Kamen/Toman 1970*). More recent works have conceptualized perceived price fairness as

outcome-related distributive price fairness and/or process-related procedural price fairness (see for example, *Maxwell 1995; Campbell 1999*; for a review, see *Friesen 2008*). Overall, the concept of perceived price fairness is a widely researched topic in behavioral pricing research (for a review, see *Homburg/Koschate 2005a; Homburg/Koschate 2005b*). However, the majority of behavioral pricing research has encompassed distributive fairness considerations while neglecting the procedural fairness dimension (*Kimes 2002; Maxwell 1997; Kimes/Wirtz 2004; Campbell 2007*).

## 2.2 The Role of internal and external Reference Prices in Price Fairness Perceptions

According to behavioral pricing literature, consumers evaluate prices relative to a standard or reference price (see *Emery 1969; Feider 1985; Hay 1987; Briesch et al. 1997*). Drawing on this relativity of price perception (*Emery 1969*) and the dichotomous dimensionality of the concept of fairness, we conceptualize (1) *perceived price fairness* as a consumer's continuous comparison between a current sales price and a reference price (distributive fairness) and (2) *perceived price system fairness* as a comparison between a current pricing procedure and a reference transaction (procedural fairness).

The current literature distinguishes between two types of reference prices: internal and external (*Vaidyanathan 2000*). Internal reference prices (IRPs), on the one hand, represent saved price experiences or price expectations which serve as subjective internal comparison standards (see *Diller 1978; Feider 1985*). Previous literature has produced various operationalizations and the IRP has often been measured as a multidimensional construct (*Winer 1988; Briesch et al. 1997*). As an example, *Chandrashekarán/Grewal (2003; 2006)* measured the IRP as the arithmetic mean of subjective estimates of the fair/just price, the normal/average market price, the lowest market price, and the highest (reservation) price.

External reference prices (ERPs), on the other hand, originate from contextual stimuli (see *Eschweiler 2006*) in the decision-making context (*Chandrashekarán/Grewal 2006*), and the literature suggests multiple operationalizations for ERPs (*Tull et al. 1964; Emery 1969; Bearden et al. 1992; Folkes/Wheat 1995*).

Regarding the interrelation between internal and external reference prices, strong empirical evidence exists that the internal reference price is influenced by external reference prices (see *Compeau/Grewal 1998; Chandrashekarán/Grewal 2003*). This finding is in line with the adaption-level theory: The adaptation level, or fair IRP, is composed of a weighted geometric mean of focal stimuli (that is, the current sales price), contextual stimuli (that is, external reference prices), and residual stimuli (that is, memory-based prices) (*Helson 1964; Hay 1987*). Although most previous conceptualizations implicitly assume that consumers do not change their IRP for a current decision based on current sales prices (*Chandrashekarán/Grewal 2006*), adaption-level theory, combined with recent findings, suggest that the inclusion of the current sales price improves the prediction of the adaptation of the IRP (*Chandrashekarán/Grewal 2006*). Therefore, this study includes the current sales price and external reference prices as antecedents to changes in the current IRP.

Taken together, the current internal reference price ( $IRP_t$ ) is the result of an initial internal reference price ( $IRP_{t-1}$ ), a current external reference price ( $ERP_t$ ), and the current sales price ( $p_t$ ) (*Hay 1987; Kucher 1987; Urbany et al. 1988; Urbany/Dickson 1991; Kalyanaram/Little 1994*). Drawing on the psychophysics of price perception, price fairness perceptions ( $PF_t$ ) result from the comparison of a given current sales price ( $p_t$ ) with the

internal reference price ( $IRP_t$ ) (see *Martins 1995; Mazumdar et al. 2005; Huang et al. 2005; Sheng et al. 2007*) (see *Figure 1*). The outcome of this comparison process is a categorical judgment about a current sales price or pricing procedure as positively unfair (that is,  $IRP_t > p_t$ , indicating a “gain”), negatively unfair (that is,  $IRP_t < p_t$ , indicating a “loss”) or fair (that is, breakeven/indifference zone) (*Oh 2003*). Most studies claim a linear association between price fairness and the altered  $IRP_t$ , implying that the larger (smaller) the difference between  $IRP_t$  and  $p_t$ , the larger (smaller) the positive or negative perceived price unfairness (see *Kopalle/Winer 1996; Grewal et al. 2004*).

### 2.3 Price Fairness Perception in the Buying Cycle

To gain insights into the dynamics of perceived price fairness, we investigated the concept along the overall purchasing process. In the service marketing literature, consumption decisions are typically structured using process models (*Hilke 1989; Müller/Klein 1993; Bieger 2007*). *Renoux (1973)* distinguishes between three main stages: (1) the pre-consumption stage, (2) the consumption stage, and (3) the post-consumption stage (see also *Fisk 1981; Kuhlmann 2001; Meffert/Bruhn 2003*; for a different model with five stages, see *Diller 1997*).

In the pre-consumption stage, information is collected, and buying or booking decisions are made. Because services are commonly characterized by a considerable delay between the time of purchase and consumption (*Shugan/Xie 2000; Bieger 2007*), additional information is collected to adjust and assure initial decisions (*Diller 1997; Diller 2002*). In this stage, friends and relatives serve as important sources of information (see *Diller 1978; Zeithaml 1981; Kuhlmann 2001; Meffert/Bruhn 2003; Fürst 2003*). In the consumption stage, consumers are exposed to additional information from co-consumers and service staff. The price a co-costumer paid plays a pivotal role in conducting fairness judgments (*Darke/Dahl 2003; Pohl 2004; Xia et al. 2004*). In the post-consumption stage, the service outcome and experiences are evaluated (see *Müller 1996; Meffert/Bruhn 2003; Pohl 2004; Mazumdar et al. 2005*). In the case of regularly consumed services such as media, leisure or transport services, the post-consumption stage may become the next pre-consumption

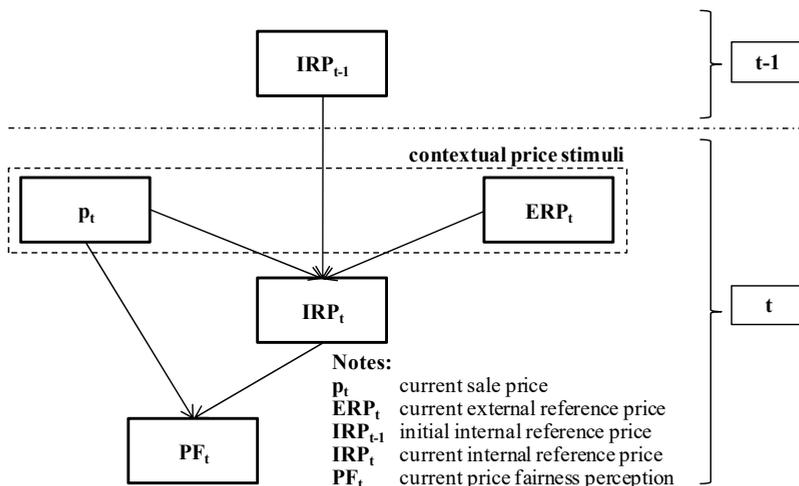


Figure 1: Role of internal and external Reference Price in Price Fairness Judgments

stage in a closed cycle (see *Friedman/Smith 1993, Kuhlmann 2001; Meffert/Bruhn 2003*), also known as the customer buying cycle (*Renoux 1973*).

In each stage of this cycle, consumers are exposed to various external reference prices. Thus, drawing on the role of external reference prices in price fairness perception, we propose that every new piece of price information along the buying cycle is perceived, encoded, and cognitively processed by the consumer (see *Chandrasekaran/Grewal 2003*). Thus, the internal reference price is constantly updated, and likewise, the perception of price (system) fairness of a given service is dynamically adapted..

With  $PF_t = p_t - f(ERP_t; IRP_t)$  and  $IRP_t$  as a superordinate reference price aggregate we follow the argumentation of *Bolton et al. 2003* who refer to the  $IRP_t$  as a single aggregated variable which serves as a measure to evaluate the fairness of  $p_t$ . Therefore, only  $p_t$  and  $ERP_t$  are manipulated with  $p_t$  equalling the  $IRP_t$  to be perceived as fair. We always distinguish between  $p_t$  and  $ERP_t$  in all our experimental hypotheses except for some manipulations where  $p_t$  should equal the  $ERP_t$ .

*Hypothesis 1: The level of perceived price fairness and perceived price system fairness is influenced by different types of  $ERP_t$  along the buying cycle.*

*Hypothesis 2: If one or more  $ERP_t$  are higher (lower) than the current sales price ( $p_t$ ) along the buying cycle, perceived price fairness and perceived price system fairness increase (decrease).*

Regarding the direction of the discrepancy between an  $ERP_t$  and the current sales price  $p_t$ , we can derive from prospect theory (*Kahneman/Tversky 1979*) that a price decrease (that is, a decrease in  $ERP_t$  leading to  $IRP_t < p_t$ ) has a larger effect on the adjustment of perceived price fairness than an equivalent price increase (that is, an increase in  $ERP_t$  leading to  $IRP_t > p_t$ ), or put another way, losses loom larger than corresponding “gains” (see *Tversky/Kahneman 1991, p. 1039*). Regarding the relative magnitude of changes in price fairness and price system fairness, the following asymmetric effect is proposed:

*Hypothesis 3: A price decrease ( $ERP_t < p_t$ ) leads to a larger adjustment of perceived price fairness and price (system) fairness than an equivalent price increase ( $ERP_t > p_t$ ).*

As an important extension to most previous price fairness studies, we distinguish between the distributive and procedural price fairness concept. What consumers perceive as a fair price system in a given industry may evolve over time (see for example, *Kimes/Noone 2002*). Thus, we propose that not only distributive, but also procedural fairness perception adjusts over time, albeit at a slower pace.

*Hypothesis 4: If the  $ERP_t$  is higher (lower) than the current sales price ( $p_t$ ), perceived price fairness and perceived price system fairness adjust in the same direction; however, the latter to a lesser degree.*

### 3. Methodology

#### 3.1 Field of Research

To study the impact of external reference prices on perceived price (system) fairness along the buying cycle, we consider revenue management pricing in the airline industry because of its appropriateness as a relevant field of research. The airline industry displays the typical constitutional elements of services, such as simultaneity of production and consump-

tion, volatile demand, and a high proportion of fixed costs (Meffert/Brubn 2003; Bieger 2007). These elements foster the implementation of segment-based price discrimination and allocation approaches to optimize revenues (Simon 1992; Müller 1996; Woratschek 1996). European low-cost airlines represent a particularly appropriate research object, because their core product is widely perceived as a commodity, implying that the price of an airfare is one of the most important choice criteria (Bieger et al. 2002; Pompl 2002; Friesen, 2008). In this context, Germany can be considered a well-developed low-cost airline market with savvy consumers and a sophisticated buying environment.

Examination of revenue management pricing in the airline industry allows us to investigate both price increase and decrease scenarios, as well as customers' perception of price level fairness and price system fairness. Because airline revenue management has a long history (McGill/Van Ryzin 1999; Lindenmeier 2005), customers are broadly exposed to and are familiar with varying airline prices. In addition, airline services evidence a considerable time lag between the information, booking, and consumption phase. This can be considered typical for services and is ideal for our purposes in studying the role of new external reference price stimuli entering consumers' price evaluation along the buying cycle.

### 3.2 Experimental Design

To test our hypotheses, we conducted a scenario-based experiment with customers of European low-cost airlines, encompassing repeated measures. Experiments are generally considered the most rigorous method to identify cause and effect relationships (see Zimmermann 1972; Aronson et al. 1990) and are widely applied in the field of behavioral pricing research (see Koschate 2002; Kimes 2002; Choi/Mattila 2004; Eschweiler 2006). A major issue in deducing causal interpretations is the internal and external validity of an experiment (Campbell 1957; Campbell/Stanley 1963). Therefore, we conducted a qualitative pre-study to refine relevant and valid operationalizations of external reference prices and price levels (for a similar approach, see Miao/Mattila 2007).

The explorative pre-study was threefold: First, we carried out sixteen semi-structured expert interviews in order to better understand customers' perception of actual pricing practices in the low-cost airline industry. Second, we conducted four focus group discussions with overall twenty-nine low-cost airline customers to explore the most relevant external reference prices which are perceived by low-cost airline customers along the buying cycle. The aim was to assess and consolidate the external reference prices drawn from the literature and to identify potential confounding variables. The focus group discussions revealed that price (system) fairness exerts its largest effect during the pre-consumption and the consumption stage of the buying cycle. Consequently, we considered only these two stages for our study. Third, we conducted a standardized self-administered questionnaire with a convenience sample of fifty low-cost airline passengers in order to further consolidate and rank the relevant external reference prices for customers in the pre-consumption and consumption-stage. This revealed four external reference prices as being of major importance along the buying cycle: (1) the current sales price, and (2) prices paid by friends and relatives in the consumption stage, as well as (3) promotional prices, and (4) prices paid by co-consumers in the post-consumption stage. As a second objective, the questionnaire aimed to define a "fair" internal reference price for low-cost flights departing from Germany to a destination within Europe (for a direct measurement

approach of fair internal reference prices, see *Anttila 1977; Kahneman et al. 1986b*). In accordance with assimilation-contrast theory, we found that customers perceive a fair price range as an internal standard, rather than a fair price point. The fair price range was acknowledged as lying between €46 (SD = 20) and €99 (SD = 31). A two-sided t-test showed no significant differences between business and leisure passengers for the fair internal price range.

As an overall result, the pre-study revealed four relevant external reference prices to constitute the independent variables (factors). From these, we derived the four different scenarios for the subsequent experimental study. Likewise, the factor levels and the  $IRP_{t-1}$  were derived from the internal price range determined in the pre-test. We then applied a mixed experimental design with a factorial design (constituted as a between-subjects design) to analyse the effects of external reference prices on perceived price fairness, as well as a repeated-measures design to study the dynamics of price fairness perceptions over time (multiple measurement points) (see *Table 1*).

*Table 1: Scenarios and Manipulations*

	<i>Scenarios and factors</i>			
	<b>Scenario 1 / Measurement point 1</b> Factor 1: <i>Current sales price</i>	<b>Scenario 2 / Measurement point 2</b> Factor 2: <i>Price paid by friends and relatives</i>	<b>Scenario 3 / Measurement point 3</b> Factor 3: <i>Promotional price</i>	<b>Scenario 4 / Measurement point 4</b> Factor 4: <i>Price paid by co-consumer</i>
<i>Factor levels</i>				
Current sales price €49	€49	€19/€79	€9	€19/€49/€79
Current sales price €99	€99	€39/€159	€19	€39/€99/€159

The two price levels of the current sales price of €49 and €99, which were introduced in Scenario 1, were directly deduced from the fair price range explored in the pre-study and the common practice in the airline industry to display odd prices that end with nine. In Scenario 2, factor levels of €30 (€60) lower or higher than the current sales price were provided. A single price cue of €9 (€19) was presented as promotional price in Scenario 3. In Scenario 4, external reference prices (that is, the price paid by a co-consumer) of €30 (€60) lower or higher than the current sales price, as well as equal to the current sales price, were displayed. Following the mixed experimental design, we applied the independent variables as repeated-measure factors, leading to an overall total of twelve factor-level combinations.

### 3.3 Experimental Study and Measures

We conducted the study as an online experiment. Because most low-cost airline services are internet-based (for example, information, booking, and paying services), an online context fosters external validity. However, internet-based experiments might lack control over the sample selection process (sample bias) (*Theobald 2000; Dolnicar et al. 2009*),

as well as over the experimental setting (Janetzko 1999), which could sacrifice internal validity.

The questionnaire was structured into four parts. In the first part, the respondents were presented with a welcome page, followed by an introduction on the administration of the survey. Then they were asked to read an introduction page that described the initial situation, which aimed to condition the respondents for a specific evaluation or decision context: booking a flight with a low-cost airline from Germany to a western European city with their best friend (see Appendix).

In the second part, the respondents were randomly distributed to the two price levels (that is, €49 or €99). The four scenarios in the buying cycle were presented along the following chronology (derived from the buying cycle):

In Scenario 1, the respondents were confronted with the current sales price for a one-way flight with a low-cost airline of either €49 or €99 which they discovered on the internet but had not booked yet. Thus, for Scenario 1 the external price stimulus (that is, the current sales price) is identical with the  $IRP_{t-1}$  derived from the pre-test. In the following three scenarios, new external price stimuli were introduced through a temporal indication (for example, “some days later...”), while the current sales price (that is, €49 or €99) was held constant throughout the whole experiment.

Scenario 2 mentioned a lower (higher) price that their best friend paid for the same flight seven days ago, while the current sales price for the respondent still remained €49 (€99).

In Scenario 3, the respondent was said to have finally booked the flight for €49 (€99). However, that same evening, the test person would discover that the low-cost airline announced a special internet promotion with prices of €9 (€19) for the specific flight.

Scenario 4 described a conversation between the respondent and a co-consumer during the flight. It turned out that the passenger in the next seat (the ‘seat neighbour’) paid more (less, or the same) for the same flight than the respondent (see Appendix).

While the perception of price fairness was measured in all four scenarios, price system fairness was only retrieved in the last three scenarios, because in Scenario 1, respondents were only presented with the current sales price offer which impeded a judgment about the perceived fairness of a price system (see Appendix). The two dependent variables, *perceived price fairness* and *perceived price system fairness*, were measured with a single-item seven-point Likert-scale ranging from 1 (“very fair”) to 7 (“very unfair”), with 2 (“fair”), 3 (“rather fair”), 4 (“neither fair nor unfair”), 5 (“rather unfair”), and 6 (“unfair”) (for other studies using Likert-scales in price fairness research, see Campbell 1999; Kimes/Wirtz 2004; Homburg et al. 2005; for other single-item scales in price fairness research, see Bearden et al. 1992; Maxwell 1997; Choi/Mattila 2004).

The final part of the scenario-based experiment involved a manipulation check (Perdue/Summers 1986). Respondents were confronted with the question whether they have paid more, the same or less than the passenger in the next seat (the ‘seat neighbour’) in Scenario 4. We also tested whether the scenarios were comprehensive and realistic using a seven-point Likert-scale (from 0 (“I totally agree”) to 6 (“I totally disagree”).

### 3.4 Sample

Overall, we collected 459 completed questionnaires, or an average of 38 questionnaires for each of the twelve experimental cells. The majority of respondents were male (68,6 %

compared to 31,4 % female), German (83,9 % German compared to 16,1 % other nationalities) and on average, between 25 and 34 years old. They displayed a relatively high level of education (77,6 % with university education) and had a high familiarity with airline transport services. Overall, 32,9 % of the respondents said that they travelled more than ten times per year by plane, 37,9 % three to ten times, and 29,2 % less than three times. Regarding low-cost flights, the proportion of respondents that said they flew more than ten times per year was 10,7 %, with another 33,3 % flying three to ten times with a low-cost airline, and the majority (56,0 %) flying less than three times.

### 3.5 Means of Analysis

To test the initially introduced hypotheses we applied t-tests, univariate, and multivariate analyses of variance (ANOVA, MANOVA), covariance analyses (ANCOVA, MANCOVA), and correlation analyses.

## 4. Results

### 4.1 Dynamic Effects of ERP on Price Fairness Perceptions

*Hypothesis 1: The level of perceived price fairness and perceived price system fairness is influenced by different types of ERP<sub>t</sub> along the buying cycle: confirmed.*

To study the dynamics of perceived price (system) fairness along the buying cycle, we drew on the four ERPs along the buying process as repeated-measures factors, and the current sales price level of €49 or €99 as between-subject factor (see Figure 2). An ANOVA of the two dependent variables along the four test intervals of the buying cycle sustained a significant main effect from the buying process on perceived price fairness ( $F_{(3,456)} = 135,905$ ;  $p < 0,001$ ) as well as on perceived price system fairness ( $F_{(2,457)} = 41,882$ ;  $p < 0,001$ ). Therewith, Hypothesis 1 is supported. Furthermore, the interaction effect between the buying process and the current sales price as between-subject factor of €49 or €99 proved to be significant for perceived price fairness ( $F_{(3,456)} = 13,546$ ;

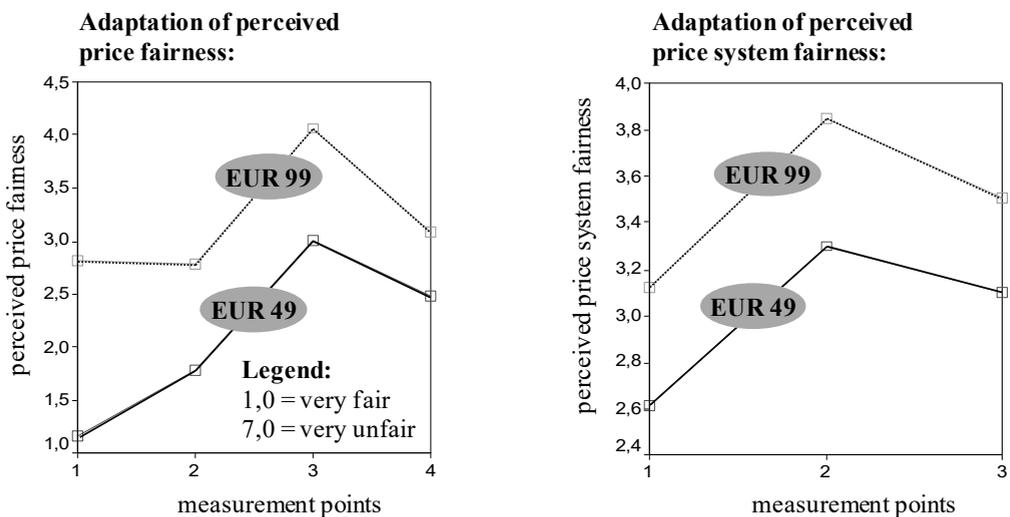


Figure 2: Adaptation of distributive and procedural Price Fairness along the Buying Cycle

$p < 0,001$ ), but not for perceived price system fairness ( $F_{(2,457)} = 0,457$ ;  $p < 0,627$ ). An ANCOVA revealed that “age” figured as significant covariate on price fairness ( $F_{(3,456)} = 4,156$ ;  $p < 0,01$ ).

*Hypothesis 2: If one or more  $ERP_{s_t}$  are higher (lower) than the current sales price ( $p_t$ ) along the buying cycle, perceived price fairness and perceived price system fairness increase (decrease): confirmed.*

The t-test showed that for both €49 and €99 price levels, perceived price fairness increased in Scenario 2 when the higher external reference price was introduced ( $T_{(235)} = -2,623$ ;  $p > 0,01$ ). Perceived price fairness also increased from Scenario 3 to Scenario 4, due to a higher external reference price presented ( $T_{(293)} = -13,289$ ;  $p > 0,001$ ). Likewise, price system fairness rose from the third to the fourth Scenario ( $T_{(293)} = -6,922$ ;  $p > 0,001$ ). Regarding the direction of price decreases, perceived price fairness declined in both conditions (€49 and €99), with lower ERPs presented in Scenario 2 ( $T_{(222)} = 9,895$ ;  $p > 0,001$ ), Scenario 3 ( $T_{(458)} = 16,371$ ;  $p > 0,001$ ) and Scenario 4 ( $T_{(164)} = 5,211$ ;  $p > 0,001$ ). Equally, price system fairness decreased from Scenario 2 to Scenario 3 ( $T_{(458)} = 11,127$ ;  $p > 0,001$ ), and from Scenario 3 to Scenario 4 ( $T_{(164)} = 6,497$ ;  $p > 0,001$ ). Thus, Hypothesis 2 is supported by the results.

*Hypothesis 3: A price decrease ( $ERP_t < p_t$ ) leads to a larger adjustment of perceived price fairness and price (system) fairness than an equivalent price increase ( $ERP_t > p_t$ ): partially confirmed — confirmed for perceived price fairness, but not confirmed for price system fairness.*

In accordance with the predictions of the prospect theory, the adjustment of perceived price fairness from Scenario 1 to Scenario 2 ( $T_{(457)} = 2,894$ ;  $p > 0,01$ ) and from Scenario 3 to Scenario 4 ( $T_{(240)} = -3,796$ ;  $p > 0,001$ ) was significantly larger for price decreases of ERP than for equivalent price increases. For perceived price system fairness, the mean differences were descriptively symptomatic, but not significant ( $T_{(295)} = -1,155$ ;  $p > 125$ ). As a result, Hypothesis 3 is confirmed for perceived price fairness, but not for perceived price system fairness.

*Hypothesis 4: If the  $ERP_t$  is higher (lower) than the current sales price ( $p_t$ ), perceived price fairness and perceived price system fairness adjust in the same direction; however, the latter to a lesser degree: confirmed.*

Correlation analysis further indicated that the adaptations in perceived price fairness and price system fairness significantly correlated in all three scenarios. Thus, distributive and procedural fairness change in the same direction over time.

Table 2: Correlation Analysis after Bravais-Pearson

Dependent variable(s)	r	N	p
Price fairness and price system fairness in Scenario 2	0.338	459	0.000
Price fairness and price system fairness in Scenario 3	0.568	459	0.000
Price fairness and price system fairness in Scenario 4	0.655	459	0.000

A paired sample t-test further revealed that the weighted sums of the differences in the dependent variables between the scenarios were significantly higher for perceived price fairness than for perceived price system fairness ( $T_{(418)} = 4,122$ ;  $p > 0,001$ ). Because

procedural fairness adjusted in the same direction as distributive fairness, but to a lesser degree, Hypothesis 4 is supported.

## 4.2 Manipulation Checks

Of all respondents, 93,5 % perceived the different levels of the fourth factor as intended. Moreover, inferential statistics for the manipulations confirm that the subjects perceived the manipulations in the initially intended directions. In addition, the scenarios were judged to be comprehensive ( $M = 1,15$ ;  $SD = 1,38$ ) and realistic ( $M = 1,14$ ;  $SD = 1,49$ ).

## 5. General Discussion

### 5.1 Theoretical Implications

The results of our study provide evidence that in service industries the perception of price fairness and price system fairness may vary considerably over time under the influence of changing external reference price cues. Thus, perceived distributive and procedural fairness for specific services were found to be dynamic concepts. This finding is consistent with previous research on the dynamics of similar behavioral constructs (for price satisfaction, see *Diller/That* 1999; *Diller* 2002; *Pohl* 2004; for price interest, see *Diller* 1982; for price image, see *Simon* 1992). This contextual adaptation process is already approved for the static case by adaption-level theory and assimilation-contrast theory (see for example, *Monroe et al.* 1977; *Winer* 1986; *Biswas/Blair* 1991). Our study extended this concept with a dynamic perspective.

Our study further revealed that the current sales price, along with other external price cues, has a significant impact on consumers' distributive and procedural price fairness judgments. In particular, we found evidence that all four applied external reference prices have a substantial influence on the dynamic adaptation of perceived price (system) fairness: (1) the current sales price, (2) prices paid by friends and relatives, (3) promotional prices, and (4) prices paid by co-consumers.

While the introduction of one or more higher price cues along the buying cycle increases the perception of price (system) fairness of a specific service, price cuts lead to lower price (system) fairness perceptions. Consistent with prospect theory, we found that equivalent price increases (that is,  $ERP_t > p_t$ ) and price decreases (that is,  $ERP_t < p_t$ ) for a given service along the buying cycle have an asymmetric impact on price fairness perceptions (but not on perceived price system fairness). An apparent “loss” due to a foregone lower price is given more weight than an equivalent “gain” of having been charged a lower price.

Moreover, our results indicate that perceived distributive fairness is more sensitive to external price cues than perceived procedural fairness. Thus, consumers' conception of what constitutes a fair reference *transaction* seems firmer than the perception about a fair reference *price*. Hence, our findings show that considerations about price system fairness become crucial. Moreover, as others' findings in the literature indicate that when a price *procedure* is perceived as fair, the likelihood increases that the *price itself* is also perceived as fair (see for example, *van den Bos et al.* 1997; *Kukar-Kinney et al.* 2007).

This study provides deeper insights into consumers' perception of distributive and procedural price fairness, thus complementing previous research that measured fairness only in the pre-consumption or consumption stage. It further extends previous studies by showing that besides widely researched competitive prices (“between-brand prices”)

and past prices (“within-brand prices”) (Eschweiler 2006), price cues introduced between the purchase and consumption stage play an equally important role in price perception — particularly when we seek to capture the dynamics of perceived price fairness for a given service alternative along the buying cycle. Thus, our study introduced a third conceptualization; that is, “within-brand between-buying stages prices”.

## 5.2 Practical Implications

Dynamic pricing practices (for example, revenue management pricing) are essential to optimize revenues in capacity-constrained service contexts (Talluri/Van Ryzin 2004). However, our study reveals that external price cues along the buying cycle play an equally important role for service providers such as airlines. As low-cost airlines are heavily relying on cheap airfares in their advertising strategy with the intent to stimulate demand the importance of the most appropriate use of external price stimuli along the buying cycle becomes evident. Constantly varying prices for a given service like airlines may affect consumers' judgments about the perceived fairness of prices and entire price systems in general. A specific price or pricing system may be perceived as fair or unfair at different stages along the purchasing process, depending on the alternative price cues perceived in the purchasing environment. Because service providers face a potential risk of being perceived as unfair along the buying cycle, consumer reactions might have negative consequences (Campbell 1999; Xia *et al.* 2004; Haws/Bearden 2006).

In order to better benefit from the inherent revenue potential, service firms such as airlines or rental car companies are well advised to incorporate price fairness considerations into the design of their variable price systems (Diller 2000; Pechtl 2003; Fasciati/Bieger 2007). The empirical results disclose that a strategic emphasis should be set on the design of external reference price cues consumers face along the pre-consumption and consumption stage. Our findings also suggest that price discrimination should be based on market segmentation according to reference price elasticity (that is, sensitivity to deviations around the internal reference price) instead of only considering reservation price or willingness-to-pay.

Besides the impact of price variations, marketers should also consider the respective pricing procedure and rules applied, according to which prices vary between customers and over time. This may have immediate consequences for the setup of airline revenue management systems. While we found that distributive fairness perceptions reacted rather quickly to marketing stimuli, perceived procedural price fairness seems rather sticky. Our study provides further evidence that price increases along the buying cycle may increase price (system) fairness of a specific service, while price cuts are likely to lower price (system) fairness perceptions. Hence, the pricing procedure of several low-cost airlines that gradually raises prices over time seems fairer to consumers from a dynamic perspective, than does introducing occasional price promotions. A “first-come-first-served” principle of gradually increasing pricing practices gives each customer the same chance to buy at a low price (see also Calder 2002; Talluri/Van Ryzin 2004). Higher prices closer to departure can be explained through opportunity costs of the airline to set seats on hold (see also Shaw 2004).

Our study also reveals another implication: that promotional prices may considerably erode price fairness perception as they decrease the IRP; that is, the standard against which the fairness of a current sales price is assessed. Hence, discounts should be set

and promoted with care, and targeted at specific customer segments or time intervals (for example, weekend specials for students only, or individualized discounts communicated through below-the-line marketing) (*Friesen 2008*).

Other fundamental approaches to decrease potential unfairness perceptions of variable pricing schemes include fencing, framing, and price communication. Rate fences are rules that assist to differentiate between transactions and intend to justify price differences between customers (for example, cancellation fees for low rates, special rates for frequent flyers). Setting effective rate fences helps customers to self-select according to their respective willingness-to-pay (*Kimes/Wirtz 2002*). In addition, framing of price stimuli can help to avoid unfairness feelings among consumers. In the likely case of price increases, the literature suggests, for example, to attribute the cause to an external source (for example, an unexpected increase in costs) (see for example, *Vaidyanathan/Aggarwal 2003*). Explaining to consumers the rationale behind a price procedure or price differences, and communicate price increases accordingly, is equally important (refer to *Monroe 2003*).

### 5.3 Limitations and Further Research

Even though this study is restricted to the case of low-cost airlines, the results may also apply to comparable service industries that adopt variable pricing, are characterized by a certain time lag between booking and consuming and denote a similar high degree of homogeneity and standardization (for example, the mobility, hospitality, or telecommunication sector). Nevertheless, replications on the dynamic adaptation process of distributive and procedural price fairness are needed, and these would be particularly interesting for service sectors characterized by a certain heterogeneity in its product or a less sophisticated price-capacity management system (for example, personal services, such as medical services or consulting).

Questions regarding whether the proven dynamic effects are durable over time when entering further stages of the buying cycle, or whether perceived price fairness stabilizes the longer a customer-supplier-relation persists, offer fruitful grounds for further research. Empirically, post-consumption price fairness evaluations might be included in the analysis. Apart from that, the experimental design focused on few, but relevant, external reference prices. Thus, further research could include other external reference price cues (for example, verbal cues), other operationalizations of external reference prices (for example, competitor prices or prices of other substitutable services), other price levels of external reference prices (for example, implausible high price levels), or differing levels of the current sales price.

## 6. Appendix: Questionnaire (Translated from German)

Extract of introduction: Together with your best friend, you plan to book a flight from Germany to a Western European city with a low-cost airline [...]. Both of you are browsing on the internet for available offers. However, each of you will independently book and pay the flight.

Scenarios: Extract of a set of scenarios

Scenario 1: Current sales price

Try to imagine that on the internet you found a suitable offer of a low-cost airline that charges €49 for a one-way outbound flight including taxes, fees, and charges. However, you do not book immediately.

*I perceive the price of €49 for an outbound flight with the low-cost airline as ...*

#### **Scenario 2: Price paid by friends and relatives**

Try to imagine some days later your friend calls and explains that seven days ago, the same outbound flight with the same low-cost airline was €19 including taxes, fees, and charges. He is pretty sure about this. Hence, you search again on the internet page of the respective low-cost airline still without booking. You notice that for €19 no seats are available anymore and that the outbound flight now costs €49 including taxes, fees, and charges.

*Compared to the price my best friend found on the internet seven days ago, I perceive the price of €49 for an outbound flight with the low-cost airline as ...*

*Based on this situation, I perceive the price system of the low-cost airline as ...*

#### **Scenario 3: Promotional price**

Try to imagine some hours later you book the outbound flight with this low-cost airline for €19 including taxes, fees, and charges on the internet. In the evening, you sit in front of your computer and notice that the same low-cost airline starts an internet price promotion for their third anniversary. Each of the 300,000 promoted tickets cost €9 for a short period of time. You are curious and enter the details of your flight already booked. You notice that your already booked outbound flight is now available for the promotional price of €9 including taxes, fees, and charges.

*Compared to the promotional price, I perceive the price of €49 for an outbound flight with the low-cost airline as ...*

*Based on this situation, I perceive the price system of the low-cost airline as ...*

#### **Scenario 4: Price paid by co-consumer**

Try to imagine some weeks later you board this very flight of the low-cost airline with your best friend. Your 'seat neighbour' asks you what you have paid for today's outbound flight. First, you are astonished. However, you answer that you have paid €49 including taxes, fees, and charges. He explains that for today's flight he paid €19 including taxes, fees, and charges. As he is quite talkative, he reports that he booked the flight on the internet on exactly the same day you bought your ticket.

*Compared to the price my 'seat neighbour' paid, I perceive the price of €49 for an outbound flight with the low-cost airline as ...*

*Based on this situation, I perceive the price system of the low-cost airline as ...*

All questions were provided with a seven-point Likert scale: "Very fair", "Fair", "Quite fair", "Neither fair nor unfair", "Quite unfair", "Unfair", and "Very unfair".

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