

Revenue management pricing in the hotel sector: Reducing perceived unfairness to encourage willingness to pay

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journals.sagepub.com/home/rme**Sourou Méatchi**

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Abstract

In a context of ever-increasing competition, revenue management pricing (RMP) has become a strategic tool for companies with limited capacity. However, despite its considerable appeal, studies show that RMP has mixed reactions from consumers. The aim of this research is to test levers of actions that can help reduce the perceived unfairness of RMP and thus promote willingness to pay (WTP). Two quantitative samples ($N_1 = 325$; $N_2 = 280$) allowed us to validate the measurement instruments for the concepts mobilized and to test two explanatory 'fairness-based pricing' models. The results show that fairness and transparency have strong positive individual and interaction effects on reducing the cognitive dimensions of perceived unfairness and on reinforcing WTP. However, the effects on the affective dimensions are not confirmed in the two models tested.

Keywords

perceived equity, perceived transparency, perceived unfairness, pricing, revenue management, willingness to pay, yield management

General introduction

In a market economy characterized by a logic of competition, the performance of companies inevitably requires innovation in products and in marketing approaches. Among the marketing innovations developed in the services sector over the last few decades is the practice of revenue management

(RM). Originally, known as yield management, RM (Appendix 1) has gradually been augmented by new levers for optimizing the range of service offerings and prices and has become a global management strategy in companies characterized by perishable assets subject to erratic demand (Domingo-Carrillo et al., 2019; Weatherford and Bodily, 1992). RM is based on accurate knowledge of consumer

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behaviour, very fine segmentation of demand and real-time modulation of capacity (supply) in order to allocate the right price to the right customer at the right time (Abrate et al., 2019). Since 1980s, the practice of RM has fostered the emergence of a new pricing approach in the services sector. This new pricing paradigm, known as pricing revenue management pricing (RMP), has been made more robust through the development of information technology and especially the Internet (Noone, 2016; Vives et al., 2018). With the development of artificial intelligence techniques (algorithms, machine learning, cognitive sciences, etc.), the practice of RMP is likely to be extended and generalized within service companies (transport, hotels, restaurants, etc.). RMP enables service companies to optimize their revenues. For the consumer, price is a decisive variable in the process of choosing services (hotel stay, visit to a theme park, car rental, etc.). However, prices based on RMP are subject to mixed perceptions. Some consumers consider them to be completely fair, while others find them unacceptable. Indeed, for the same journey and within the same time slot, air or train fares can be very different from one customer to another. Similarly, booking a hotel room a long time in advance (early booking) is not always enough to obtain advantageous prices compared to customers who book at the last minute and who may obtain knock-down prices. Faced with this dilemma, consumers find themselves in a state of bewilderment that often results in a negative image of RMP. For Camus et al. (2014), regardless of the price paid by the customer (lower or higher than the expected price), the risks of perceived unfairness with regard to RMP are high. In the case of a disadvantageous price, customers may find it difficult to accept that they could have paid less for the same service. In the case of a favourable price, despite its positive perceived value, the RM-based price may also be considered unfair because of its discriminatory nature. Perceived unfairness is clearly a permanent risk for companies that practice RMP. In light of the above findings, the central question of this study is to understand how perceptions of unfairness regarding RMP are manifested and what levers might be used to reduce these perceptions and increase consumers' willingness to pay (WTP). Answering these questions gives rise to several theoretical and managerial

contributions. On the theoretical level, our study responds to the call by a number of authors (e.g. Colquitt et al., 2015; Kimes and Wirtz, 2015; Rupp et al., 2017) for researchers to further examine the concept of perceived unfairness because, in their view, this particular form of injustice is particularly salient for those who have experienced it. Our research also aims to provide theoretical and empirical insights into the effects of fairness and transparency on the perception and acceptability of prices arising from RMP. To this end, we elaborate and discuss a fairness-based pricing model. We first draw on the main literature on the subject (e.g. Kahneman et al., 1986; Sahut et al., 2016; Xia et al., 2004), which leads us to position perceived transparency and perceived equity (fairness) as two independent explanatory variables in their relationship with perceived unfairness and WTP (Model 1). Second, we mobilize other approaches (e.g. Maxwell, 2008; Noone, 2016; Zhang and Jiang, 2014) which lead us to consider the possible moderating role of perceived transparency on the relationship between perceived equity and perceived unfairness, on one hand, and on the relationship between this independent variable and WTP, on the other hand (Model 2). Our research, therefore, aims to test and compare two models – a model with two independent variables and a model with one independent variable and a moderator variable – in order to determine their performance in reducing perceived unfairness and increasing WTP prices based on RMP. From a managerial point of view, our research should help service firms to better understand the phenomenon of perceived unfairness with respect to RMP. It should also provide them with new strategic and operational levers to reduce this phenomenon and thus promote WTP. The article is organized in four main sections. Section 'Literature review on perceptions of and WTP prices based on RMP: A varied but limited literature' presents the literature review and its limitations. Section 'Comparing the research hypotheses of the two models' discusses the model and research hypotheses. Section 'Research methodology' describes the methodology used to collect and analyse the empirical data. Section 'Results of the research' presents the research findings. Following these four sections, a general conclusion discusses the findings and suggests possibilities for future research.

Literature review on perceptions of and WTP prices based on RMP: A varied but limited literature

This article is situated within the literature on the perception of prices based on RMP. Price perception can be defined as a judgement made by consumers regarding the monetary amount they are required pay to acquire a product. This judgement may be positive (perceived fairness) or negative (perceived unfairness) and leads the consumer to accept or refuse the transaction (Bolton et al., 2003; Lu et al., 2019). Equitable pricing is an ever-present issue because it is of daily concern to most consumers. Indeed, whether it concerns the price of petrol, medical expenses, or the dynamic pricing on amazon.com, most acts of consumption are associated with a price. However, despite their importance in transaction systems, prices often pose problems of fairness. For instance, if an Amazon customer discovers that the price of the same product (a CD, a book, a toy, etc.) varies from one moment to another or from one context to another, he or she may become angry with the company (Adamy, 2000; Tripathi, 2017). This example shows how prices and in particular RM-based prices can lead to a perception of unfairness and have damaging consequences for firms. The literature also postulates that perceived unfairness is the main cause of reduced WTP prices resulting from RMP (Noone and Mattila, 2009; Wu et al., 2012). Yet, despite the richness of the existing literature, there are few empirical studies on how perceptions of and the acceptability of RMP could be improved. It is therefore important to explore new avenues of research on the strategies to be implemented in order to limit the risks of perceived unfairness and its corollaries in the context of RMP.

Theoretical and conceptual framework of the research

As noted above, despite the abundant literature on the subject, few empirical models have been tested on strategies to reduce the perceived unfairness of RMP and the WTP prices associated with it. The purpose of this study is to help fill this gap

by proposing and comparing two fairness-based pricing models. Both are based on the theory of fair pricing. Formulated by Xia et al. (2004) in accordance with the work on the dual entitlement principle (Kahneman et al., 1986) and on theories of social (Adams, 1965) and organizational (Greenberg, 1987) justice, fair price theory analyses the way in which consumers judge prices and the treatment they receive in transactional relationships. This psycho-economic theory emphasizes two fairness factors: perceived equity, on one hand, and perceived transparency, on the other hand. According to Xia et al. (2004), both factors are important to consumers because they are in their best interests. If consumers feel that their contribution to a transaction is not being rewarded fairly, they may feel they have suffered an injustice. Similarly, consumers may feel that it is unfair if the information made available is not transparent (Campbell, 2007). The literature also postulates that in the context of RMP, the lack of perceived equity and transparency generally leads to a decline in WTP (Kimes and Wirtz, 2016; Noone and Mattila, 2009).

Before analysing the cause-and-effect relationships underlying our two research models, we need to first present the various concepts mobilized through the literature review and, in particular, through analysis of the theory of fair pricing.

Perceived price equity (PPE). In the context of prices, the principle of fairness (Deutsch, 1975; Xia et al., 2004) considers that exchange relations are fair when the cost–benefit ratio is balanced. This principle also postulates that fairness entails giving all consumers the same chances of access to a product or a price. Deutsch's (1975) model suggests that in the context of transactional exchanges, the principle of equity (the cost–benefit ratio) must be taken into account. This distributive justice approach has been adopted in numerous research studies on prices (e.g. Inman and Nikolova, 2017; Taylor and Kimes, 2011). In this study, we use the concept of PPE as understood not only by Deutsch (1975) but also by Oliver and Swan (1989a, 1989b), Xia et al. (2004) and Vukadin et al. (2019)

Perceived transparency of information (PTI). In addition to PPE, PTI also plays an important role in

judging prices (Noone, 2016; Sahut et al., 2016). According to Heyman and Mellers (2008), as part of the purchasing process, consumers assess not only the price level but also the transparency of information on the price fairness ratio, the conditions of sale and the benefits associated with each price level. In doing so, they generally rely on information made available to them by the company and, where appropriate, by other stakeholders (other customers, consumer associations, public administrations, etc.). If the information available does not allow consumers to understand the company's pricing policy, they may perceive it as unfair. Transparency of information depends on the clarity, accuracy, consistency and reliability of the information provided (Colquitt et al., 2015). Many authors (e.g. Choi and Mattila, 2005; Ferguson et al., 2014) show that the absence or inadequacy of price information can lead consumers to doubt the fairness of the price. However, providing justifications for pricing policy would reduce negative judgements and favour WTP (Bearden et al., 2003; Li et al., 2019).

Perceived unfairness of RMP. In the context of RMP, perceived unfairness is generally defined as a negative perception of the value of a transaction (Camus et al., 2014). In the hospitality sector, studies have shown that a customer who pays more than someone else for a similar service where there is no discernible difference in quality may view the situation as unfair (Kimes, 1994). For Xia et al. (2004), price unfairness has two dimensions: one is cognitive, the other one is affective. The cognitive dimension indicates that perceptions of unfairness are based on a comparison with a relevant standard (e.g. average market price), a benchmark (e.g. the price of a previous purchase) or a norm (e.g. membership rate). The affective dimension, however, concerns into negative emotions that accompany cognition. Both dimensions will be used in this research.

WTP RMP prices. In consumer behaviour research, WTP is generally defined as the likely attitude that a consumer may take towards a price (Dodds et al., 1991; Tanford et al., 2018). According to Le Gall-Ely (2009), WTP is a part of the price perception process and is similar to the concepts of benchmark price and acceptable price. It is also related to other

variables influencing the decision process (satisfaction, loyalty, etc.). In perceptual approaches, WTP is used to measure either the acceptability of a specific price for a given product (e.g. WTP €2 for a small bottle of water in a railway station; WTP €60 or €150 for a Paris–Nice flight), or the acceptability of a family of prices (e.g. WTP dynamic airline prices). In this study, we will be concerned with the WTP regarding a family of prices or a pricing model. The reason for this preference is that our study is oriented towards measuring the acceptability of a pricing model (in this case, RMP) and not towards measuring the acceptability of a specific amount (for example, WTP €950 for a smartphone). Consequently, measurement by qualitative or semantic items will be used. This approach has already been used by other consumer behaviour researchers. For example, in her study on WTP for airline tickets, Maxwell (2002) measured WTP with semantic indicators (Appendix 2). In the hotel sector, Noone and Mattila (2009) adapted the semantic scale of Grewal et al. (1998) to measure WTP variable hotel room prices.

Comparing the research hypotheses of the two models

Drawing on the literature, we put forward two fairness-based pricing models. According to the theory of fair pricing (Xia et al., 2004), perceived equity and perceived transparency have positive effects on price perception. However, no empirical models have yet been tested regarding the effects of perceived equity and perceived transparency on reducing perceived unfairness and on WTP in the context of RMP as practised by hotels. Moreover, no research to our knowledge has yet investigated the effects of interactions between perceived equity and perceived transparency in the context of RMP. Yet, the literature review suggests that the effect of equitable pricing on perceived unfairness depends on the information transparency policy (Maxwell, 2008). It thus appears that the perceived equity of pricing and the PTI could have, on one hand, individual and direct effects (model 1) and, on the other hand, interaction effects with perceived equity as an independent variable and perceived transparency as a moderator variable (model 2). We will test and

compare the two models in order to determine which one works best in reducing perceived unfairness and in strengthening WTP. With this in mind, we first present hypotheses on the individual and direct effects of perceived equity and perceived transparency on the reduction of perceived unfairness and on WTP (model 1). In a second step, hypotheses on the effects of interactions between perceived equity (independent variable) and perceived transparency (moderator variable) will be formulated (model 2).

Individual effects of perceived equity and transparency on perceived unfairness and WTP (Model 1 – Figure 1)

According to heuristic approaches to social justice (e.g. Brown-Liburd et al., 2018; Lind, 2001), in situations of uncertainty, individuals make decisions either by limiting themselves to the first solution identified or by proceeding through sequential steps that enable them to progressively eliminate unfavourable alternatives and retain only a limited range of solutions perceived as optimal. Consumers' heuristic behaviours can therefore lead them to take shortcuts in their judgements and limit themselves to the first considerations they identify (e.g. the cost–benefit ratio, available information, procedures, etc.). Under these conditions, consumers would not need fairness and transparency simultaneously in order to assess the fairness or unfairness of a price. The reduction of perceived unfairness and WTP could therefore occur as a result of a single main factor. This primary factor may be either the perceived equity of the price or the PTI. Customers for whom the most important criterion is fairness will be satisfied with the balance of the cost–benefit ratio in assessing the equity of a price, while those who are more concerned with transparency will focus their attention on the quantity and quality of information available to them (Miao and Mattila, 2007). In what follows, we present and test the hypotheses that PPE and PTI each have positive individual effects on reducing perceived unfairness and on WTP in the context of RMP.

Effects of PPE on the reduction of perceived unfairness and on WTP. Much previous research postulates

that lack of equity is a factor in perceptions of unfairness in RMP. According to Kimes (1994) and Kimes and Wirtz (2016), the application of the dual entitlement principle (Kahneman et al., 1986) in the context of prices suggests that RMP is unfair. This is because prices based on RMP are not always linked to production costs but to the exploitation of economic anomalies in the market. Campbell (2007) argues that consumers feel that prices are unfair when they have no reasonable justification. However, when consumers find it in their interest to have a pricing policy, they become less demanding in terms of price justice (Camus et al., 2014; Kimes and Wirtz, 2002). It can be seen from the literature that some authors (e.g. Bolton et al., 2003) focus mainly on analysing the role of fairness in price perception and WTP. In the light of the factors just mentioned, it would seem that, all other things being equal, fair pricing may be sufficient to reduce perceived unfairness and promote WTP. Our first three research hypotheses stem from this premise.

H1. Perceived equity has a positive effect on reducing the cognitive dimension of perceived unfairness with respect to RMP

H2. Perceived equity has a positive effect on reducing the affective dimension of perceived unfairness with respect to RMP

H3. Perceived equity has a positive effect on willingness to pay the prices resulting from RMP

Effects of PTI on the reduction of perceived unfairness and on WTP. Regarding the individual effects of perceived transparency, Miao and Mattila (2007) postulate that the quality of the information available plays a fundamental role in price perception. In turn, Morwitz et al. (1998) suggest that the way in which prices are presented (complex vs simple display) is an antecedent of perceived transparency, which is itself a factor in perceived equity and WTP. It has also been shown that consumers' heuristic behaviour often leads them to make rapid judgements by limiting themselves to the basic criteria available to them (Lind, 1992, 2001). Consumers for whom the most important criterion is transparency will use only this one indicator in assessing the fairness of a price. They may focus on the clarity,

consistency and reliability of information in order to determine whether the price is fair (Maxwell, 2008; Tanford et al., 2012). Under these conditions, when individuals do not have transparent information that allows them to assess their benefits in relation to their costs (internal fairness) or to assess the cost–benefit ratio of other customers (external fairness), they may consider that the price paid or observed is inequitable. To mitigate the sense of perceived unfairness and its consequences on WTP, some authors (Campbell, 2007; Li et al., 2019) suggest using transparency of information, since this variable may play an important individual role in price perception. Drawing on the literature on price transparency, we put forward the following hypotheses.

H4. Perceived transparency has a positive effect on reducing the cognitive dimension of perceived unfairness with respect to RMP.

H5. Perceived transparency has a positive effect on reducing the affective dimension of perceived unfairness with respect to RMP.

H6. Perceived transparency has a positive effect on willingness to pay the prices resulting from RMP.

Interaction effects of perceived equity and perceived transparency on perceived unfairness and WTP (Model 2 – Figure 2)

As we have already seen through the literature review, in models of price perception, the effects of perceived equity and perceived transparency are generally studied separately or sequentially. However, no model to our knowledge has empirically tested the effects of interactions between perceived equity and perceived transparency on the reduction of perceived unfairness and on WTP. However, some studies (e.g. Maxwell, 2008; Sahut et al., 2016) suggest that in order to reduce perceived unfairness in RMP and promote WTP, any fairness-based approach needs to be accompanied by a policy of information transparency. According to Maxwell (2008), a fairness policy that is not accompanied by transparent information is ineffective in mitigating perceptions of injustice and

enhancing WTP. In the context of RMP, perceived equity and perceived transparency would therefore produce positive interaction effects in terms of reducing perceived unfairness and in terms of WTP. Based on the above, we assume that there are interaction effects between the perceived equity of the price and the PTI on the reduction of perceived unfairness and on WTP. This assumption leads us to put forward the following hypotheses.

H7. Perceived equity and perceived transparency interact positively to reduce the cognitive dimension of perceived unfairness with respect to RMP.

H8. Perceived equity and perceived transparency have positive interaction effects on reducing the affective dimension of perceived unfairness with respect to RMP.

H9. Perceived equity and perceived transparency have positive interaction effects on willingness to pay the prices resulting from RMP.

In this second model (Figure 2), perceived equity retains its status as an independent variable, while perceived transparency becomes a moderator variable. This new distribution of roles between the two variables is based on distributive justice (Oliver and Swan, 1989a; Xia and Monroe, 2010) and heuristic approaches to price equity (Brown-Liburd et al., 2018; Lind, 2001; Maxwell, 2008). These different approaches have shown that in the context of prices, customers tend to consider fairness criteria first. According to Maxwell (2008), the primary factor that consumers evaluate in the context of prices is their fairness. If the price observed or obtained is different from the usual price or the price paid by other customers, the consumer then looks for reasons justifying the observed price differences. Under these conditions, transparency of price information becomes a moderator of the effects of perceived equity on perceived unfairness and on WTP.

Research methodology

In this section, we present the methodology for data collection and analysis and the procedure for selecting and validating measurement instruments.

Collection and pre-analysis of quantitative data

In order to operationalize the constructs and test the conceptual model, we conducted two quantitative data collections. The first ($N_1 = 325$) was carried out by means of a questionnaire administered face-to-face. The sample is very much varied in terms of age (21–25 years: 42%; 26–35 years: 15%; 36–45 years: 20%; 46 years and above: 23%), gender (women: 62%; men: 37%; others: 1%) and socio-professional category (PCS+: 23%; PCS–: 29%; retired: 4%, student/doctoral students: 24%; others: 20%). This first collection allowed us to pre-test the measurement scales of the variables mobilized. The second collection ($N_2 = 280$) was carried out using a scenario-based experimental method (Bolton et al., 2003; Lavorata et al., 2005). A 2×2 factorial design (Appendix 3) used for this purpose. The experimental scenarios were constructed with the help of three hoteliers from the city of Angers (Hôtel d'Anjou 4*, Hôtel Les Trois Lieux 3* and Hôtel Iéna 2*). Respondents were randomly assigned to the four experimental conditions, with each subject assigned to a single experimental group. It is therefore an inter-subject experiment. Data collection was carried out through the Internet using an access panel of the research company CReATESTS. In this way, a total sample of 280 respondents was interviewed. The socio-demographic characteristics of the sample are relatively varied in terms of gender (women: 41%; men: 59%), age (21–30 years: 25%; 31–40 years: 25%; 41–50 years: 25%; 51 years and above: 25%) and socio-professional category (PCS+: 23%; PCS–: 30%; intermediate occupations: 18%; retired: 4%; other: 25%).

Validation of measurement instruments

The measurement instruments used were taken from the existing literature. They were all subjected to purification tests and statistical analyses in accordance with Churchill's (1979) paradigm, Rossiter's (2002, 2011) recommendations and Fornell and Larcker's (1981) criteria. Statistical

tests confirmed the reliability and validity of the concepts used (Appendix 4).

Measurement of perceived unfairness with respect to RMP

The perceived unfairness scale was taken from Méatchi and Camus (2018b). This scale comprises three dimensions (perceived normative deviance, perceived opacity and negative affects) and nine reflective items (Jarvis et al., 2003) with an explained variance of 78.52%. The high correlation between normative deviance and perceived opacity led us to test a second-order model with two dimensions, namely, a cognitive dimension with five items (α : 0.89; p : 0.92; AVE (*Average Variance Extracted*): 0.70) and an affective dimension with three items (α : 0.74; p : 0.85; AVE: 0.66). Cronbach's alpha (α) and Dillon–Goldstein's rho (p) are satisfactory in that they all have coefficients greater than 0.07, the threshold usually recommended in the psychometric literature. Finally, the scale was integrated into the explanatory model, thus enabling us to test its predictive validity.

Measurement of the other constructs

The scales of the other constructs (WTP, perceived equity and perceived transparency) were also taken from the literature and then tested for reliability and validity. For WTP, we used and adapted the Dodds et al.'s (1991) five-item scale. From the five indicators, we selected the three most appropriate for our research objectives. Reliability and validity tests were very satisfactory ($\alpha = 0.74$; $\rho = 0.85$; AVE = 0.65). For measurement of perceived equity, we used three items from the Oliver and Swan's (1989) scale. The results of the statistical tests are also satisfactory ($\alpha = 0.81$; $\rho = 0.88$; AVE = 0.71). Finally, in order to measure perceived transparency, indicators of informational justice (Colquitt et al., 2015) were chosen. Three indicators for measuring informational transparency (clarity, explanation and precision) were selected and tested. The results of the reliability and validity tests are likewise satisfactory ($\alpha = 0.65$; $\rho = 0.81$; AVE = 0.57).

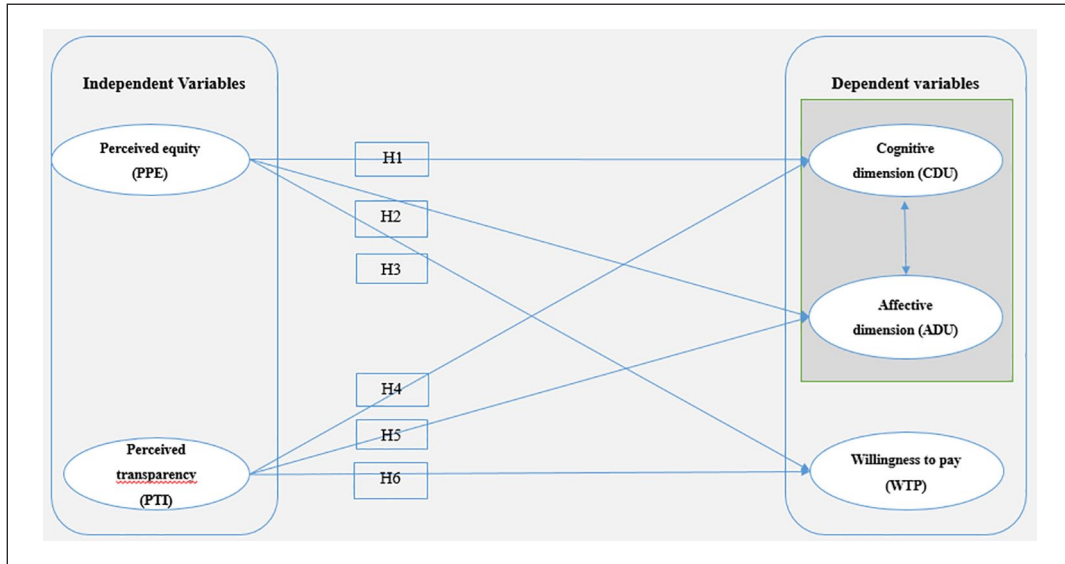


Figure 1. Individual effects of perceived equity and transparency on perceived unfairness and WTP (Model 1).

Justification of the choice of structural equations for testing the explanatory model. Although the data from experimental designs are traditionally analysed using variance analysis (ANOVA), we decided to use the structural equation method (SEM) to process our data. The SEM has a number of advantages. First of all, it is very efficient for processing any type of data as long as the variables are measured with numerical scales (Baron and Kenny, 1986: 1177). Second, unlike ANOVA, structural equations can handle all the relationships between variables in a model simultaneously. Finally, Iacobucci (2008) showed that structural equations are a superior method of ANOVA and regressions. These various reasons justify our choice of the SEM for testing the model.

Results of the research

The first fairness-based pricing model (Figure 1) tested the individual effects of each of the independent variables (perceived equity and perceived transparency) on reducing perceived unfairness and on WTP. The second model (Figure 2) tested the interaction effects between an independent variable (perceived equity) and a moderator variable

(perceived transparency). Summary tables of the scores of the estimated parameters (Addinsoft, 2019) are provided in Appendices 5 and 6. The results of the different tests are commented below.

Individual effects of perceived equity and perceived transparency on the reduction of perceived unfairness and on WTP

In order to determine whether PPE and PTI individually affect the reduction in perceived unfairness and WTP, we analysed the individual effects of each of these two variables. The results are presented in the following paragraphs.

Figure 3 shows that under the individual effects of PPE and PTI, the cognitive (R^2 : 0.68) and affective (R^2 : 0.16) dimensions of perceived unfairness varied by 0.68% and 0.16%, respectively. With regard to WTP (R^2 : 0.71), the variation was 0.71%. We now need to analyse the direction of the relationships and the scores in each relationship to confirm the hypotheses of the first model tested.

Effects of PPE. Recall that the first condition of our experimental design is to measure the effects of

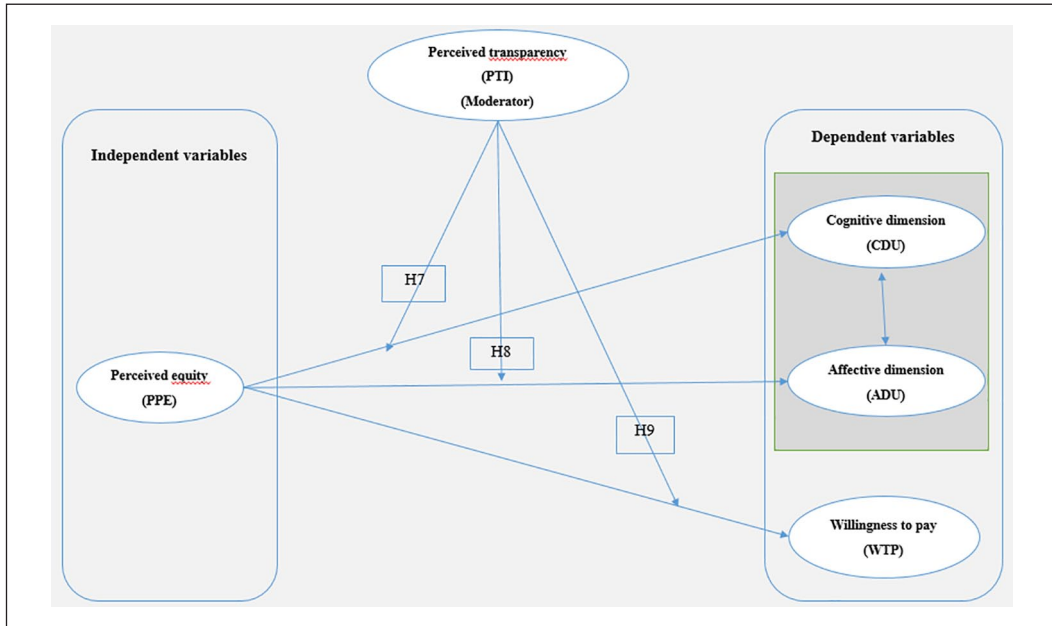


Figure 2. Moderating role of perceived transparency on the relationship between perceived equity and perceived unfairness and WTP (Model 2).

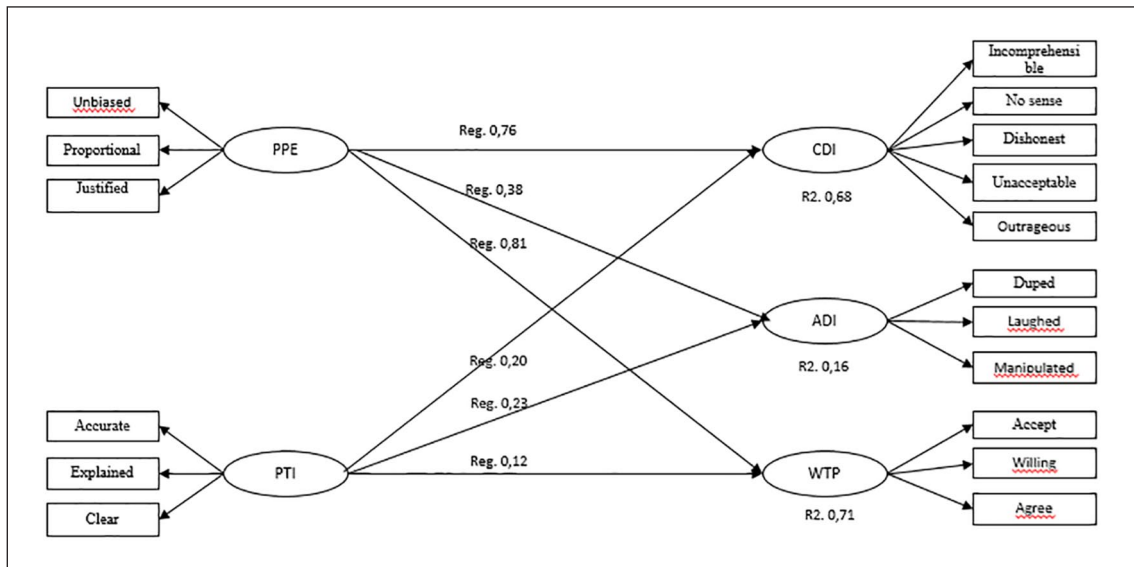


Figure 3. Model 1 with the statistical scores of the effects tested.

perceived equity on perceived unfairness and on WTP. The parameter scores for this experimental condition are as follows.

Table 1 shows that PPE has positive and significant effects on reducing the cognitive dimension of unfairness ($\beta: 0.76; p < 0.01; f^2: 1.70$) and

on WTP (β : 0.81; $p < 0.01$; f^2 : 2.22). However, the effects on the reduction of the affective dimension are negative (β : -0.38 ; $p < 0.01$; f^2 : 0.16). On the

basis of these statistical elements, hypotheses H1 and H3 are confirmed and hypothesis H2 is disconfirmed.

Hypotheses	Confirmed
H1. Perceived equity has a positive effect on reducing the cognitive dimension of perceived unfairness with respect to RMP	Yes***
H2. Perceived equity has a positive effect on reducing the affective dimension of perceived unfairness with respect to RMP	No
H3. Perceived equity has a positive effect on willingness to pay the prices resulting from RMP	Yes***

RMP: revenue management pricing.

***Hypothesis confirmed at the 1% threshold ($p < 0.01$).

Table 1. Scores of effects of perceived price equity (PPE).

Endogenous variables	Exogenous variables	β	SE	t	$Pr > t $	f^2
Perceived price equity (PPE)	CDU	0.76	0.03	21.70	0.00***	1.70
	ADU	-0.38	0.06	-6.68	0.00***	0.16
	WTP	0.81	0.03	24.72	0.00***	2.21

β : regression; SE: standard error; t: T test; $Pr > |t|$: threshold of significance; f^2 : effect size; CDU: cognitive dimension of perceived unfairness; ADU: affective dimension of perceived unfairness; WTP: willingness to pay.

*** $p < 0.01$.

Table 2. Scores of effects of perceived transparency of information (PTI).

Endogenous variables	Exogenous variables	β	SE	t	$Pr > t $	f^2
Perceived transparency of information (PTI)	CDU	0.20	0.03	5.66	0.00***	0.12
	ADU	0.23	0.06	4.14	0.00***	0.06
	WTP	0.12	0.03	3.58	0.00***	0.05

β : regression; SE: standard error; t: T test; $Pr > |t|$: threshold of significance; f^2 : effect size; CDU: cognitive dimension of perceived unfairness; ADU: affective dimension of perceived unfairness; WTP: willingness to pay.

*** $p < 0.01$.

Effects of PTI. Under the second experimental condition, we tested the individual effects of perceived transparency on perceived unfairness and WTP. The aim was to find out whether, on an individual basis, perceived transparency on reduced perceptions of unfairness and increased WTP. The statistical scores obtained are shown in Table 2.

The above scores show that perceived transparency (PTI) has positive and significant

individual effects on reducing the cognitive (β : 0.20; $p < 0.01$) and affective (β : 0.23; $p < 0.01$) dimensions of perceived unfairness. The statistics also show that the effects of perceived transparency on WTP are positive and significant (β : 0.12; $p > 0.01$). These statistics confirm all the hypotheses (H4, H5 and H6) on the individual effects of the PTI, with a very significant threshold of 0.01.

Hypotheses	Confirmed
H4. Perceived transparency has a positive effect on reducing the cognitive dimension of perceived unfairness with respect to RMP	Yes***
H5. Perceived transparency has a positive effect on reducing the affective dimension of perceived unfairness with respect to RMP	Yes***
H6. Perceived transparency has a positive effect on willingness to pay the prices resulting from RMP	Yes***

RMP: revenue management pricing.

***Hypothesis confirmed at the 1% threshold ($p < 0.01$).

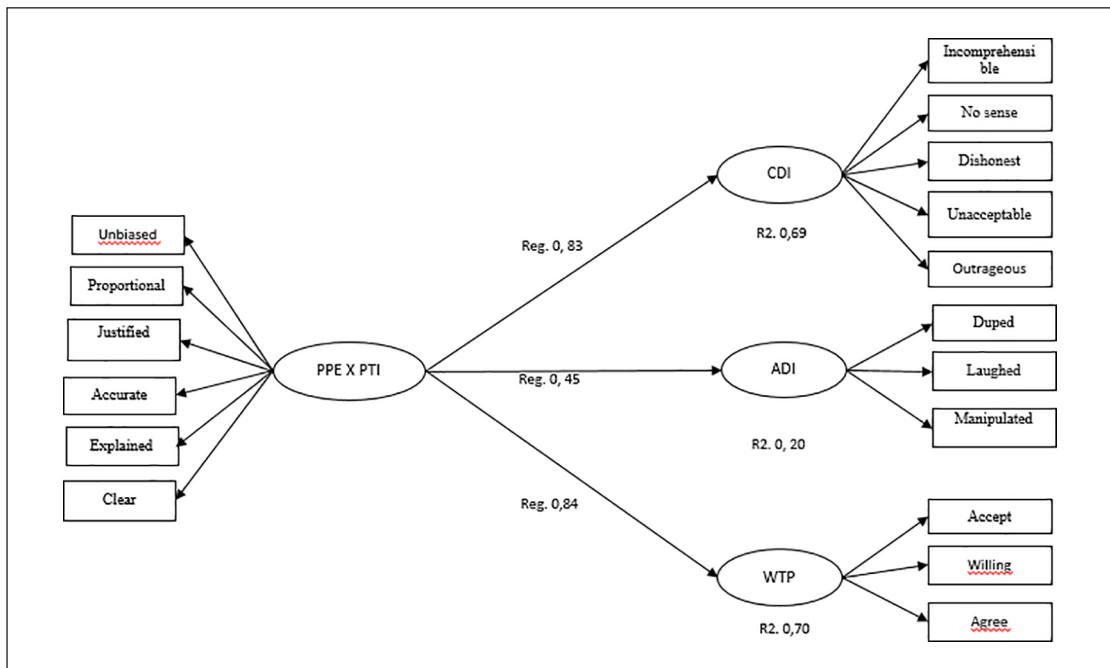


Figure 4. Model 2 with interaction effect scores.

Interaction effects of perceived equity and perceived transparency on the reduction of perceived unfairness and on WTP

After testing the hypotheses regarding individual effects, we investigated whether PPE and PTI had positive and significant interaction effects on reducing perceived unfairness and on WTP. Remember that in our interaction hypotheses (Model 2), perceived equity is the independent variable and perceived transparency is used as a

moderator variable. Three interaction effects were tested using partial least squares (PLS) regressions and then the Chow test.

Testing interactions by the PLS method. The results of testing interactions by the PLS method are shown in Figure 4 and Table 3.

Figure 4 shows that the interaction between perceived equity (PPE) and perceived transparency (PTI) has effects on the cognitive (R^2 : 0.69) and affective (R^2 : 0.20) dimensions of perceived unfairness with respect to RMP. This interaction also

Table 3. Interaction effects of perceived equity (PPE) and perceived transparency (PTI).

Interaction effects	Exogenous variables	β	SE	t	Pr > t	f^2
PPE \times PTI	CDU	0.83	0.03	24.66	0.00***	2.19
	ADU	-0.45	0.05	-8.30	0.00***	0.25
	WTP	0.84	0.03	25.73	0.00***	2.38

β : regression; SE: standard error; t: T test; Pr > |t|: threshold of significance; f^2 : effect size; CDU: cognitive dimension of perceived unfairness; ADU: affective dimension of perceived unfairness; WTP: willingness to pay.
*** $p < 0.01$.

Table 4. Comparison between Model 1 and Model 2.

Exogenous variables	Model 1 Effects of perceived equity without moderation of perceived transparency	Model 2 Effects of perceived equity with moderation of perceived transparency
CDU	0.76	0.83
ADU	-0.38	-0.45
WTP	0.81	0.84

CDU: cognitive dimension of perceived unfairness; ADU: affective dimension of perceived unfairness; WTP: willingness to pay.

Table 5. Results of the Chow test.

Exogenous variables	β (difference)	t (observed)	t (critical)	DoF	p-value	Significant
CDU	0.23	2.29	1.96	558	0.02**	Yes
ADU	0.25	1.33	1.96	558	0.18	No
WTP	0.97	4.35	1.96	558	0.01**	Yes

CDU: cognitive dimension of perceived unfairness; ADU: affective dimension of perceived unfairness; WTP: willingness to pay; DoF: degree of freedom.
** $p < 0.05$.

affects WTP (R^2 : 0.70). The direction of the relationships and the statistical scores below will enable the hypotheses on the interaction effects of the model to be confirmed or not.

Comparison of Models 1 and 2 with the Chow test

The regression coefficients shown above reveal differences between the effects of perceived equity in Model 1 (model without interactions and with transparency) and the effects of the same inde-

pendent variable in Model 2 (interaction model) (Table 4).

In order to determine whether the observed differences (Table 5) are significant, a Chow test with multi-group analyses (Gavard-Perret et al., 2012: 323) was carried out. The results are as follows.

The Chow test (Table 5) shows positive and significant differences between the model without interactions (Model 1) and the model with interactions (Model 2) in the cognitive dimension of perceived unfairness (β : 0.23; $p < 0.01$) and in WTP (β : 0.97; $p < 0.01$). However, the difference is not

Hypotheses	Confirmed
<i>H7. Perceived equity and perceived transparency interact positively to reduce the cognitive dimension of perceived unfairness with respect to RMP</i>	Yes**
<i>H8. Perceived equity and perceived transparency have positive interaction effects on reducing the affective dimension of perceived unfairness with respect to RMP</i>	No
<i>H9. Perceived equity and perceived transparency have positive interaction effects on willingness to pay the prices resulting from RMP</i>	Yes**

RMP: revenue management pricing.

**Hypothesis confirmed at the 5% threshold ($p < 0.05$).

significant with regard to the affective dimension of perceived unfairness ($\beta: 0.25$; $p < 0.18$). The Chow test scores confirm hypotheses H7 and H9 and disconfirm hypothesis H8.

Conclusion: Contributions, limitations and future research

This article has presented the findings of research on the perception of and WTP prices based on RMP. The study makes multiple contributions at both the theoretical and the managerial levels.

Theoretical contributions

On the theoretical level, four main contributions have emerged from this research. The first concerns the empirical validation of two models for the reduction of perceived unfairness and developing WTP prices resulting from RMP. As previously mentioned, despite the abundant literature, few empirical models on strategies to reduce perceived unfairness and on WTP have been tested in the context of RMP. Second, the literature is completely silent on the effects of interactions between perceived equity and perceived transparency in the context of RMP. Existing models are generally exploratory, and the assumptions regarding levers for reducing perceived unfairness and enhancing WTP have received little empirical testing. Our research has helped to fill this gap in the literature by validating two fairness-based pricing models. The first suggests that perceptual variables, particularly perceived equity and perceived transparency, have direct positive individual effects on reducing

perceived unfairness and WTP in the context of RMP. Specifically, the confirmation of hypotheses H1 and H3 shows that PPE has direct positive individual effects on reducing the cognitive dimension of perceived unfairness with respect to RMP and on WTP. These findings reinforce the theories of perceived equity (Oliver and Swan, 1989; Xia and Monroe, 2010) and dual entitlement (Kahneman et al., 1986) which postulate that fairness in a pricing policy helps to attenuate the cognitive dimension of perceived unfairness. Conversely, the disconfirmation of H2 suggests that perceived equity in pricing does not have a significant effect on the affective dimension of perceived unfairness. The disconfirmation of this hypothesis makes it clear that the presence of equity is not always sufficient to reduce the negative effects that a consumer may experience in the context of RMP. This finding supports models postulating that, regardless of the price paid by the customer (whether lower or higher than the expected price), the risk of perceived unfairness in RMP may still exist (Camus et al., 2014). Indeed, in the case of an advantageous price, despite perceived equity, RM-based pricing may induce negative emotions (anger, disgust, guilt, etc.) because of the relatively opaque and discriminatory nature of RMP (Granados et al., 2018). With regard to the effects of perceived transparency, the confirmation of all the hypotheses (H4, H5 and H6) about the individual effects of this factor shows the critical importance of information in the context of RMP. These findings show that consumers need to know why in certain sectors they pay different prices for the same product category (e.g. a train ticket on the same route and time slot). If consumers have clear and reliable information on the reasons

for price differences, they will be more likely to accept RMP and pay the prices resulting from this practice.

The second theoretical contribution concerns the comparison of the performances of the two models tested: one with two independent variables (perceived equity and perceived transparency), the other with an independent variable (perceived equity) and a moderator variable (perceived transparency). The Chow test showed that the interaction between perceived equity and perceived transparency has significant effects in terms of reducing the cognitive dimension of perceived unfairness and in terms of WTP. The confirmation of hypotheses H7 and H9 shows that in order to reduce perceived unfairness and promote WTP, it is necessary to simultaneously mobilize levers of equity (e.g. price as a function of room size) and transparency (clear and reliable information, etc.). However, the disconfirmation of hypothesis H8 reveals that the use of transparency (as a moderator) is not always sufficient to reduce negative affect regarding RMP. Other variables (e.g. the company's compliance with ethics, corporate social responsibility, etc.) would also be among the criteria taken into account by consumers to assess price equity. We conclude that, therefore, the two models tested are roughly equivalent in terms of performance in reducing perceived unfairness and in strengthening WTP. What the models have in common is that they both disconfirm the hypotheses regarding the affective dimension of perceived unfairness, except for the individual effect of perceived transparency. However, they both corroborate all the hypotheses about reducing the cognitive dimension of unfairness and enhancing WTP. Furthermore, comparing the performance of perceived equity with that of perceived transparency shows that perceived equity has positive effects on the cognitive dimension and on WTP, but not on the affective dimension, in either the first or the second model. The effects of perceived transparency, however, are all positive in both models, except on the reduction in the affective dimension in the second model. These findings allow us to draw a second conclusion that perceived transparency (whether as an independent variable or as a moderator variable) appears to be a fundamental factor in reducing the

cognitive and affective dimensions of perceived unfairness and in strengthening WTP. Perceived equity, however, is highly effective in reducing the cognitive dimension of perceived unfairness and in promoting WTP. But it is insufficient to reduce the affective dimension of perceived unfairness. Our research has therefore highlighted the limitations of pricing strategies focussed only on the benefit–cost ratio (equity) and has shown the importance of perceived transparency. These conclusions support theories according to which the affective dimension of perceived unfairness is generally difficult to reduce when RMP strategies are limited to improving equity (benefit–cost ratio) without taking other factors into account. Apart from equity and transparency, other variables would also be important to the consumer in the context of RMP. These include, for example, factors relating to the company's compliance with social norms (Maxwell, 2008; Méatchi and Camus, 2018), ethics (Goldman and Cropanzano, 2015; Pez et al., 2017) and corporate social responsibility (Koschate-Fischer et al., 2016; Thiery, 2005). Integrating these variables into an RMP strategy may be a better way to reduce the affective dimensions of perceived unfairness and to augment WTP.

The third theoretical contribution concerns fair pricing in relation to justice and equity theory (Xia et al., 2004) as the main analytical framework in our research. This is an important contribution because little previous research has adopted this theoretical framework. Most existing models have used either the mutual interest or dual entitlement principle (Kahneman et al., 1986) or organizational justice theories (Greenberg, 1987) as the basis for analysing the perception of prices. However, these theories are only partial and do not provide an integrative understanding of the issues related to justice and WTP prices resulting from RMP (Xia et al., 2004). By mobilizing the theory of fairness in pricing, our research provides a broader view of strategies for reducing perceived unfairness and strengthening WTP. The theory of fairness-based pricing has made it possible not only to simultaneously take into account the cognitive and affective dimensions of perceived unfairness but also to mobilize fairness and transparency in the same explanatory model.

This integrative approach is used very little in models based on theories of organizational justice (Greenberg, 1987) or on the dual entitlement principle (Kahneman et al., 1986), which are focused on cognitive variables rather than affective variables.

The fourth and final theoretical contribution concerns conceptual clarification, two-dimensional measurement and predictive validation of the concept of perceived unfairness with respect to RMP. We mobilized this concept after defining and measuring it in two dimensions (cognitive and affective). We then tested its predictive validity by incorporating it into our explanatory model. These different psychometric valences allow us to give perceived unfairness a clear theoretical status differentiating it from similar or antonymic concepts such as perceived equity, something that had not yet been done in the literature on price perception, in general, and in models on the perception of RMP, in particular.

Managerial contributions

On the managerial level, our study also has a number of implications. Hotel companies are generally torn between the benefits of revenue management and the risks of perceived unfairness associated with this practice. While the benefits of RMP are well established, the concern of those in the hotel industry (particularly small and medium-sized hotels) is how to apply pricing through revenue management (RMP), while limiting the risks of a 'boomerang effect'. Our research has attempted to address this issue by proposing an RMP model based on fair pricing and PTI. We refer to this model as 'fairness-based pricing'. Rather than being a revolutionary model, it is an incremental approach that invites professionals to take into consideration perceptual variables (perceived equity, perceived transparency, etc.) in their revenue management practices. From this perspective and in order to meet consumers' expectations in terms of equity and transparency, the hypotheses tested and confirmed in this research suggest that managers should complement traditional models based on sales histories and stochastic approaches (Belobaba, 1989; Koch et al., 2017) by integrating equity and transparency levers. The integration of

fairness into RPM models can be achieved through supply-side value enhancement techniques (Rivière and Bourliataux-Lajoinie, 2017; Xia and Monroe, 2010). In other words, to implement a fairness-based pricing policy, the company should enrich the value of its offering when it wants to post higher prices. Conversely, if it feels the need to post lower prices in order to stimulate demand, it will need to review certain attributes of the offering so that customers who have already paid the highest prices do not feel they have been short-changed. Customers expect the price difference to be justified by a difference in the value of the offering and not only by the reservation date (calendar model) or by demand pressure (threshold curve model). Similarly, a differentiation strategy based on hedonic and sensory attributes (e.g. the view offered by the room, the quality of room decoration, etc.) or instrumental attributes (Wi-Fi access, minibar, etc.) can be used as an ingredient of fair pricing. Price management based on fairness and value for money can meet both internal and external fairness principles (Maxwell, 2008). However, a fairness policy is of little use if the company is not transparent about its pricing policy. Providing customers with clear and accurate information on the pricing policy is essential for reducing negative cognitive and affective reactions to RMP. Previous research (e.g. Ayadi et al., 2017) has shown that clarity, accuracy, consistency and reliability of pricing information are key criteria that enable consumers to make their decision during the purchasing process. Transparency of information is one of the indicators mostly used by consumers to assess (procedural and distributive) fairness in the context of prices. The hypotheses corroborated in this research chime with the postulates proposed in previous studies and show that the provision of transparent information is one of the key levers for reducing perceptions of unfairness and promoting WTP. Service companies, such as the French national railway company (SNCF), have become aware of the challenges of transparent price information. Since 2017, SNCF has been implementing a transparency policy called the 'Information First' programme. The programme was initiated in response to the very strong dissatisfaction expressed by customers about the information provided by the

company. The real change behind this programme is the priority given to customer information.

Limitations of the research

Regarding the limitations of our study, we are aware that there are certain weaknesses that need to be addressed before considering new avenues of research. First, the global model of fairness-based pricing that we tested focused on two fairness variables, namely, perceived equity and perceived transparency. Other dimensions of fairness (e.g. perceived ethics, perceived value of the offering, etc.) were not taken into account in the model. The absence of these variables may be the reason for the disconfirmation of hypothesis H2 in the first model and hypothesis H8 in the second model. Despite the presence of perceived equity and transparency, consumers may feel it unjust if they believe that the firm does not respect ethical principles (Ayadi et al., 2017) or that a price level is inconsistent with the value of the corresponding offering (Xia and Monroe, 2010). Second, our model does not incorporate contingency variables or variables related to individual characteristics (income, price sensitivity, familiarity with RM, etc.) and socio-demographics (age, gender, occupation, etc.). However, previous research (e.g. Heo and Lee, 2011) has shown that individual consumer characteristics and certain contingency factors (e.g. state of the competition, the customer's nationality and culture, etc.) play an important role in the perception of RMP. The inclusion of situational variables would have been helpful to find out whether these variables have an impact on the perception of revenue management and on the WTP prices based on this technique. Third, methodological limitations also need to be taken into consideration. The scenarios proposed in the experimental design are likely to be biased. Even though our scenarios were constructed with the utmost rigour and with the aid of professionals, these tools nevertheless remain theoretical frameworks whose practical application in 'real life' may not yield the same results as those of this study. Their testing under real-life conditions in hotels will be needed to demonstrate their robustness. Moreover, the samples used in this research are not perfectly representative, with some socio-professional categories such as retirees poorly represented (4%).

Prospects and avenues for future research

We will conclude this article with some suggestions for future research. First, we suggest that the scale for measuring perceived unfairness be retested in other contexts to test its performance and especially its external validity. The deployment of this instrument on other RMP issues and in other sectors (e.g. rail transport, catering, theme parks, etc.) would be a way of confirming its reliability and its internal and external validity. With respect to reducing perceived unfairness and improving WTP, we suggest that other policy levers for reducing perceived unfairness in RMP be explored. These might include, for example, levers relating to ethics, procedural justice and interactional justice that were not addressed in this research. Levers based on the perceived value of supply (Rivière and Mencarelli, 2012) are also avenues of research to be explored. Furthermore, future research should carry out experiments regarding our fairness-based pricing model under real conditions. These new tests could establish the operational efficiency of the two models. It would, for example, involve working with hotels that agree to commit to a pricing approach based on fairness (benefit–cost ratio) and transparency. Doing so would make it possible to measure the reactions of 'real' customers to an RMP model based on both equity and transparency as independent variables and a second model based on equity as the independent variable and transparency as the moderating variable. Our research thus opens up new avenues of investigation regarding strategies to reduce the perceived unfairness of RMP policies and the regarding levers of action that can be mobilized to promote WTP. Furthermore, mediation tests (e.g. the mediating role of perceived unfairness in the relationship between perceived equity and WTP) and other moderation tests (e.g. the moderating effects of individual consumer variables) are also avenues to be explored in future research.

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Appendix 1. Definitions of terms used in RM research.

Revenue management	Yield management	Pricing or RMP
RM is a comprehensive strategy for forecasting, optimizing and controlling capacity, prices and turnover in companies with capacity constraints and perishable assets (Buckhiestern, 2011; Weatherford and Bodily, 1992).	The aim of yield management is to manage unit revenues through an optimal allocation of capacity by tariff class (Capiez, 2003; Legoh�el et al., 2013).	The purpose of RMP is to organize and manage the pricing policy and price grids according to the overall objectives set within the framework of RM (Heo and Lee, 2011).

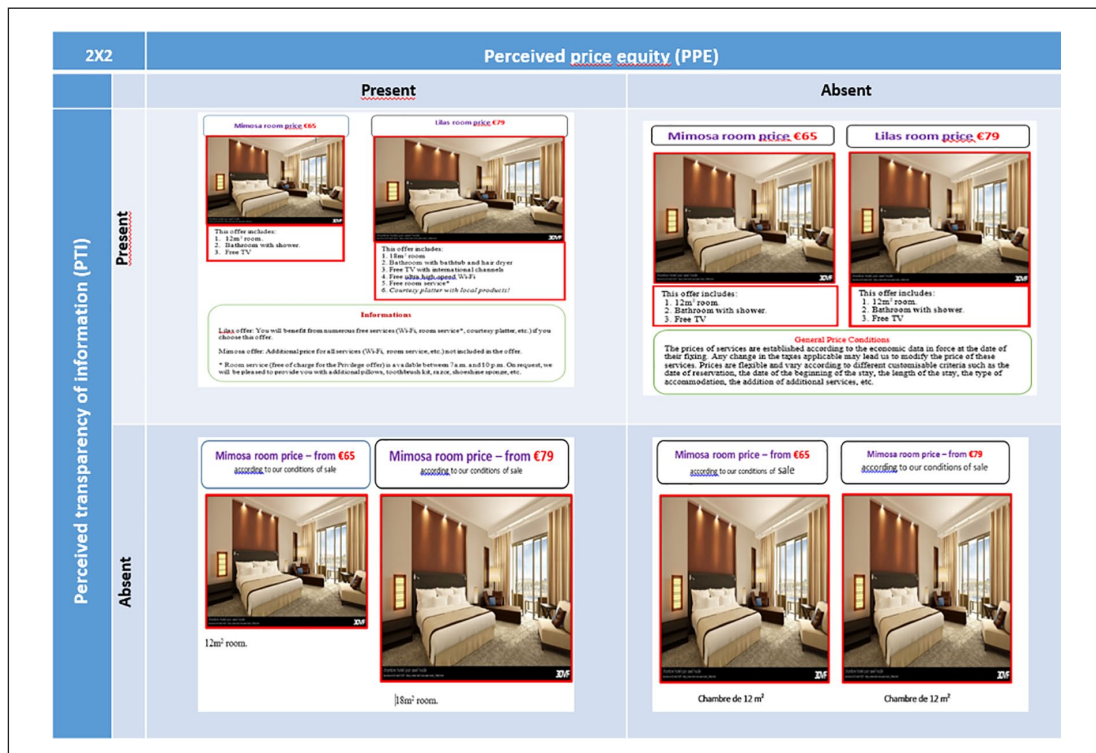
RMP or pricing is a component of revenue management (RM). RM involves more than pricing alone and makes use of other levers such as overbooking, distribution management and performance analysis (Kimes, 1994). RMP: revenue management pricing.

Appendix 2. Maxwell's (2002) WTP (Willingness To Pay) scale with French translation.

Original items in English	Traduction en fran�ais
<i>The likelihood of my purchasing this ticket is . . .</i>	La probabilit� que j'ach�te ce billet est . . .
<i>My willingness to buy the ticket is . . .</i>	Mon intention de payer ce billet est . . .
<i>The probability that I would consider buying this ticket is . . .</i>	La probabilit� pour moi d'acheter ce billet est . . .

Appendix 3. Presentation of the factorial design and research stimuli.

Under the first condition (Scenario 1), price equity and transparency of information are simultaneously tested to measure interaction effects. Under the second condition (Scenario 2), only transparency is tested to measure its individual effects. Under the third condition (Scenario 3), only equity is tested. Finally, under the fourth condition (Scenario 4), equity and transparency were both removed in order to measure the effects of their joint absence on the dependent variables.



Appendix 4. Reliability and validity of endogenous and exogenous model variables.

Latent variables	Reflective indicators (items)	Loadings	Cronbach's alpha (α)	DG rho (ρ)	AVE (Average Variance Extracted)
Perceived price equity (PPE)	Proportional price	0.90	0.81	0.88	0.71
	Impartial price	0.71			
	Justified price	0.91			
Perceived transparency of information (PTI)	Clear information	0.66	0.65	0.81	0.57
	Explanation	0.70			
	Accurate information	0.88			
Cognitive dimension of perceived unfairness (CDU)	These prices are unacceptable	0.89	0.89	0.92	0.70
	These prices are dishonest	0.83			
	These prices are outrageous	0.85			
	These prices are incomprehensible	0.82			
	These prices do not make sense	0.79			
Affective dimension of perceived unfairness (ADU)	We are being duped	0.79	0.74	0.85	0.66
	They are laughing at us	0.81			
	We are being manipulated	0.83			
Willingness to pay (WTP)	I accept these prices	0.84	0.74	0.85	0.65
	I am willing to pay these prices	0.81			
	I agree to pay these prices	0.78			

DG: Dillon–Goldstein.

Appendix 5. Summary of latent variable scores for Model 1.

1. Scores of the individual effects of perceived equity (PPE) and perceived transparency (PTI) on the cognitive dimension of perceived unfairness (CDU)

R^2 (CDU/I)	F	$Pr > F$	R^2 (bootstrap)	Standard error	Critical ratio
0.68	289.23	0.00	0.69	0.06	10.55

Path coefficients (CDU/I)

Latent variable	Value	Standard error	t	$Pr > t $	f^2
PPE	0.76	0.03	21.70	0.00	1.70
PTI	0.20	0.03	5.66	0.00	0.12

2. Scores of the individual effects of perceived equity (PPE) and perceived transparency (PTI) on the affective dimension of perceived unfairness (ADU)

R^2 (ADU/I)	F	$Pr > F$	R^2 (bootstrap)	Standard error	Critical ratio
0.16	26.27	0.00	0.22	0.08	2.00

(Continued)

Appendix 5. (Continued)

Path coefficients (ADU/1)

Latent variable	Value	Standard error	t	Pr > t	f ²
PPE	-0.38	0.06	-6.68	0.00	0.16
PTI	0.23	0.06	4.14	0.00	0.06

3. Scores of individual effects of perceived equity (PPE) and perceived transparency (PTI) on willingness to pay (WTP)

R ² (WTP/1)	F	Pr > F	R ² (bootstrap)	Standard error	Critical ratio
0.71	344.94	0.00	0.72	0.06	11.46

Path coefficients (WTP/1)

Latent variable	Value	Standard error	t	Pr > t	f ²
PPE	0.81	0.03	24.72	0.00	2.21
PTI	0.12	0.03	3.58	0.00	0.05

Appendix 6. Summary of latent variable scores for Model 2.

1. Scores for the effects of interactions between perceived equity (PPE) and perceived transparency (PTI) on the cognitive dimension of perceived unfairness (CDU)

R ² (CDU/2)	F	Pr > F	R ² (bootstrap)	Standard error	Critical ratio (CR)
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Path coefficients (DCU/2)

0.69	608.27	0.00	0.70	0.06	11.14
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Latent variable	Value	Standard error	t	Pr > t	f ²
PPE × PTI	0.83	0.03	24.66	0.00	2.19

2. Scores for the effects of interactions between perceived equity (PPE) and perceived transparency (PTI) on the affective dimension of perceived unfairness (ADU)

R ² (ADU/2)	F	Pr > F	R ² (bootstrap)	Standard error	Critical ratio (CR)
0.20	68.91	0.00	0.23	0.09	2.27

Path coefficients (ADU/2)

Latent variable	Value	Standard error	t	Pr > t	f ²
PPE × PTI	-0.45	0.05	-8.30	0.00	0.25

3. Scores of the effects of interactions between perceived equity (PPE) and perceived transparency (PTI) on willingness to pay (WTP)

R ² (WTP/2)	F	Pr > F	R ² (bootstrap)	Standard error	Critical ratio (CR)
0.70	662.15	0.00	0.71	0.06	11.12

Path coefficients (WTP/2)

Latent variable	Value	Standard error	t	Pr > t	f ²
PPE × PTI	0.84	0.03	25.73	0.00	2.38