



# Gap-alert? Quantity surcharge practices vs. guest expectations

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## ABSTRACT

This study explores whether customers are aware of the hotel industry's counter-intuitive practice of quoting higher daily room rates for longer stays. We assess and characterize the relationship between customers' room rate expectations and length of stay (LOS), and contrast them with the industry's pricing practice of quantity-surcharge along a spectrum of stay periods. We find that most guests expect to pay less when they stay longer, hence the gap. Interestingly, we find that the longer the stay, the larger this LOS-induced gap between the hotels' quoted rates and their customers' rate expectations, and that the gap's rise is non-linear.

## 1. Introduction

Length of stay (LOS) is a key element in a traveller's decision-making processes (Decrop and Snelders, 2004; Dellaert et al., 1998; Martinez-Garcia and Raya, 2008). It is affected by several factors, such as the traveller's familiarity with the destination, time restrictions and health conditions (Bargeman and van der Poel, 2006; Court and Lupton, 1997; Fleischer and Pizam, 2002; Gokovali et al., 2007; Martinez-Garcia and Raya, 2008). Other notable LOS-determining factors include nationality, spending capacity, accommodation prices, destination characteristics and attractiveness (Alegre and Pou, 2006; Barros et al., 2010; De Menezes et al., 2008; Gokovali et al., 2007; Fleischer and Pizam, 2002; Martinez-Garcia and Raya, 2008). In reverse, LOS affects firms' decisions, as well as customers' behavior. Notably, a traveller's LOS is an important element from a revenue management (RM) standpoint: hotels set LOS-based RM controls and room rates (e.g., Jain and Bowman, 2005; Pekgün et al., 2013; Quain et al., 1999; Riasi et al., 2017; Weatherford, 1995; Wilson, 2013; Wilson et al., 2015). In addition, LOS shapes and motivates the market segment of extended stay hotels (e.g., Geieregger and Oehmichen, 2008; Stoessel 2012; Withiam, 1997), and it affects travelers' satisfaction, expenditure and accommodation selection (e.g., Barros and Machado, 2010; De Oliveira Santos et al., 2014; Lockyer and Roberts, 2009; Mak et al., 1977; Neal, 2004; Peypoch et al., 2012; Salmasi et al., 2012).

In a recent study, Riasi et al. (2017) found that on average, US hotels quote higher room rates with longer stays. This quantity surcharge practice in hotel revenue management is interesting from a research perspective because there is, in fact, an established and opposite general business practice (across a wide range of industries) of offering quantity discounts (e.g., Agrawal et al., 1993; Munson and Rosenblatt, 1998; Nason and Della

Bitta, 1983; Wansink, 1996). Moreover, economics and marketing theories suggest the opposite. That is, these theories point to a negative relationship between quantity demanded and price (e.g., Anderson and Putterman, 2006; Granger and Billson, 1972; Härdle and Kirman, 1995; Nason and Della Bitta, 1983; Wansink, 1996).

Motivated by the counterintuitive pricing practice in the hotel industry, this study explores the relationship between the reported quantity surcharge and customers' expectations. Accordingly, we offer three primary study objectives:

- Assess the extent to which hotel guests are aware of these LOS-based quantity surcharges.
- Characterize the relationship between LOS and travelers' expected room rates.
- Identify and describe the characteristics of a potential gap between the industry's LOS-based pricing practices, and customers' expectations of how quoted room rates should be impacted by LOS.

To sum up, the major contribution of this study is twofold. We are first to outline the relationship between customer intended LOS and their expectations regarding the room rates, and we are first to empirically investigate the existence, and nature of, a potential gap between the industry practices and the customers rate expectations in relation to LOS.

The remainder of the paper is organized as follows: Section 2 discusses the theoretical underpinnings of both price discount expectations and quantity surcharges. Section 3 describes the research methodology, the data sets and the coding used to facilitate a meaningful comparison of the two data sets, along the spectrum of stay periods, to study the gap's specifics. Section 4 outlines the findings, along with the statistical tests. Section 5 summarizes the

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theoretical and empirical research contributions, provides insights for hotels' revenue managers, outlines the main study limitations and provides directions for future research.

## 2. Theoretical background

For products offered in various package sizes, the literature identifies three typical pricing schemes: quantity discount, linear pricing, and quantity surcharge (Abdulai et al., 2009). A unit price may decrease as the package size increases, resulting in some sort of quantity discount being offered to consumers who purchase larger packages (Dunphy, 2016). Alternatively, the unit price might increase proportionally to the package size, a mechanism termed as linear pricing (Armstrong and Vickers, 2010). Finally, unit prices may increase as package sizes increase. The latter practice is termed quantity surcharging and it occurs when the same physical product is sold in packages of different sizes, and the package with the larger size is sold at a higher unit price compared to the smaller one (Clerides and Courty, 2015; Gupta and Rominger, 1996; Heeler et al., 2007; Dunphy, 2016).

In a recent study, Riasi et al. (2017) reported that the hotel industry practices quantity surcharging, showing that, on average, hotels in the US quote a higher daily rate when the guests stay for a longer duration. The authors concluded that hotel revenue managers might believe that the downsides of offering a discount to attract longer staying customers, e.g., losing potential income from high willingness to pay customers, and from displacing higher paying customers, outweigh the benefits, e.g., cost saving from longer staying customers.

While Riasi et al. (2017) are first to report a quantity surcharge practice in relation to a service industry, there are numerous examples and reports about quantity surcharges with consumer goods (e.g., Abdulai et al., 2009; Agrawal et al., 1993; Clerides and Courty, 2015; Nason and Della Bitta, 1983; Widrick, 1979a, 1979b; Zotos and Lysonski, 1993). Interestingly, quantity surcharges are quite common among various products despite consumers' typical expectation to pay less when they buy larger packages (Granger and Billson, 1972; Manning et al., 1998; Nason and Della Bitta, 1983; Palla et al., 2010; Wansink, 1996). For instance, Agrawal et al. (1993) found that among grocery items, almost 18% of large packages are quantity surcharged. Their findings indicated that the likelihood of being exposed to a quantity surcharge across brands and stores is almost 62% if a large package of "Tuna Chuck Light Oil" is picked randomly, whereas for "Raisin" it is less than 2%. Widrick (1979a) found similar patterns across supermarket products, however their results indicated that more than 33% of all grocery products are quantity surcharged. In another study using store audits in Rhode Island, Nason and Della Bitta (1983) found that quantity surcharging is widely practiced with significant differences across product categories. Their survey of shoppers indicated that many were unaware of the existence of such surcharges and in fact believed that unit prices should always decrease as package sizes increase (Nason and Della Bitta, 1983). Studies have also shown that quantity surcharging is not exclusive to the U.S. market (Abdulai et al., 2009; Clerides and Courty, 2015; Palla et al., 2010; Zotos and Lysonski, 1993).

Why quantity surcharges? Some researchers believe that quantity surcharging occurs when a retailer promotes products with smaller packages while leaving the prices of the larger packages unchanged (Clerides and Courty, 2015). Accordingly, the unit prices of the smaller packages drop below the unit prices of the larger ones, and as a result, the buyers of the larger-sized packages are expected to switch to the smaller-sized packages, given that they can approximate their desired quantity by purchasing multiple small packages of the same product. It follows that if all customers realize the price benefit of switching to smaller-sized packages, the sales of the larger packages should decrease by 100% relative to what they would have been in the absence of quantity surcharging. However, a recent study by Clerides and Courty (2015) showed that when laundry detergents in a Dutch supermarket were quantity surcharged, the sales of the larger packages dropped by only 27% relative to the sales of the week preceding the quantity surcharge. This means that 63% of the customers did not realize that the

product was quantity surcharged, or might have had other reasons for not switching.

Retail price setters might use quantity surcharging to price discriminate against consumers who expect quantity discounts (Gupta and Rominger, 1996). The common practice of quantity discounting (Cude and Walker, 1984; Dunphy, 2016; Gerstner and Hess, 1987) has conditioned customer to assume that larger packages always cost less per unit (Granger and Billson, 1972; Nason and Della Bitta, 1983; Wansink, 1996). Accordingly, many consumers are unlikely, or reluctant, to make within-brand unit price comparisons since they have little incentive to do so (Agrawal et al., 1993; Dickson and Sawyer 1990; Hoyer 1984). In other words, certain groups of shoppers may use package size as a signal of unit price, rather than bother to conduct a careful, within-category, price comparison (Manning et al., 1998). Some retailers take advantage of this situation, and raise the prices for larger packages to increase their profitability at the expense of consumers who neither expect, nor notice, the quantity surcharges (Gupta and Rominger, 1996). Nason and Della Bitta (1983) refer to this as "volume discount heuristic" while Manning et al. (1998) term it "quantity discount belief".

Since LOS is a specific form of "quantity demanded", and the hotel room rate is the "price of a product", it follows that the observation that quoted rates increase as LOS increases could be considered a manifestation of quantity surcharging in a service industry setting. Motivated by marketing studies that found evidence for quantity surcharging, and by the recent finding that hotels also practice quantity surcharging (Riasi et al., 2017), this study aims to explore whether hotel guests are aware of, or expect, these LOS-based quantity surcharges.

**Research question 1:** What percentage of hotel customers expect to pay more per day when they stay longer?

As mentioned above, a general widespread business practice of offering quantity discounts, especially among inventory type firms, indoctrinate customers to expect to pay less per unit when they purchase larger quantities (e.g., Agrawal et al., 1993; Munson and Rosenblatt, 1998; Nason and Della Bitta, 1983; Wansink, 1996). The marketing literature suggests that the majority of customers expect to pay less per unit when buying larger packages (Granger and Billson, 1972; Nason and Della Bitta, 1983; Wansink, 1996), and that the relationship between unit prices and package sizes is nonlinear, i.e., they do not expect unit prices to drop proportional to the increase in package sizes (Wansink, 1996). In sum, quantity discounts find theoretical justifications in nonlinear pricing models, are commonplace in everyday life (Clerides and Courty, 2015), and consequently customers expect them to exist (Nason and Della Bitta, 1983; Wansink, 1996).

Additionally, economics theory suggests that there is a negative relationship between quantity demanded and the price per unit (e.g. Anderson and Putterman, 2006; Härdle and Kirman, 1995), and this downward slope of the demand curve is attributed to the income effect (Abad and Aggarwal, 2005; Bulte and Kooten, 2002; Burnetas and Ritchken, 2005; Schultz, 2008; Kaya and Canli, 2013). The income effect suggests that as the price of a product declines, the real income (i.e., what customers can buy with their income) increases, and consequently customers demand larger quantities. In other words, when price decreases, consumers can buy a larger quantity with the same income and when price increases, the real income diminishes and the customers' purchasing power diminishes (Economics Online, 2017). It follows that in the case of hotel reservations, travelers are more likely to stay longer, i.e., demand a higher quantity of room nights, when the daily room rates are lower. The same income effect suggests that customers who intend to stay longer are willing to pay less per night.

Given these established theories, our study investigates whether the relationship between customers expected average nightly rates and their LOS is indeed negative, and whether it is linear or nonlinear.

**Research question 2:** How do customers expect the quoted daily room rates to change when they stay longer?

It is argued in literature that price theory is characterized by a paradox (Diamantopoulos, 2003; van der Rest and Roper, 2013). Despite being "one of the most highly developed fields in economics and marketing science" (Simon, 1989), "there is hardly another business subject area that has had so little reverberation in practice as has price theory" (Diller, 1991). Researchers

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