



The effect of idiosyncratic price movements on short- and long-run performance of hotels



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ABSTRACT

It is a common belief that businesses performance should not be evaluated by immediate fiscal returns, but rather based on an extended time horizon. While the literature implies that pricing decisions may exert lagged as well as contemporaneous effects on performance, a limited number of empirical studies have focused on such effects. The current study investigates effects of idiosyncratic price movements on short-run and long-run hotel performance, where idiosyncratic price movements refer to the changes in individual hotels' room rates unexplained by price competition, product differentiation, and market conditions. By analyzing spatial panel data from the Houston lodging market between 2005 and 2014, we find that idiosyncratic price movements enhance hotel performance in the short-run and that adverse effects followed in the long-run. Findings of the study and implications for practitioners are discussed along with suggestions for future research.

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1. Introduction

A good pricing strategy is considered indispensable to maintain profitability in the hotel business. Robust pricing systems have been shown to increase hotel sales from five to ten percent (Cuddeford-Jones, 2013). Even during downturns in the business cycle, revenue management techniques enable hotels to achieve sustainable performance while maintaining product quality (Elliott, 2003). Notable implementations of successful pricing strategies include Marriott Hotel and InterContinental Hotel Group, who credit this method with \$100 and \$145 million USD in annual revenue increments, respectively (Koushik et al., 2012).

Hotels are faced with perishable, short-term constrained capacity (Weatherford and Bodily, 1992) and small marginal costs, where small marginal cost is generally interpreted as a negligible increase in production costs when serving an additional customer (Desiraju and Shugan, 1999). Given these industry characteristics, the natural behavior of hotel firms entails maximizing revenue through price adjustments based on demand. Such pricing strategy helps increase hotel revenue, as a discounted product in times of low demand can be more attractive to customers (Narasimhan, 1984; Scitovszky, 1944), while pricing to demand enhances firms' surplus

by capturing higher willingness-to-pay customers in times of high demand (Zhang et al., 2012).

Meanwhile, managers often face a dilemma in their attempt to balance between short-run and long-run goals (e.g., Ganesan, 1994; Mentzer et al., 2000), as a company's optimal response to environmental transitions can vary based on its adoption of topical or progressive perspectives, respectively (Kirchhoff and Kirchhoff, 1980). This trade-off between contributions to long- and short-run objectives is particularly evident in hotel pricing decisions. Hotel rooms have zero salvage value (Guo et al., 2013) as empty rooms cannot be kept in inventory for the future sales (Stolarz, 1994). While the fixed supply may incentivize managers to emphasize maximization of daily revenues (e.g., Wang and Brennan, 2014), such orientation generally drives operators to overlook long-term profitability (Hayes and Abernathy, 1980). Put differently, potentially myopic objectives may lead to management practices conflicting with achievement of the hotels' long-run objectives.

In this regard, a holistic evaluation of hotels' pricing strategies necessitates examination of their total effects to performance. To the extent that hotels' pricing strategies may have potentially adverse long-run consequences in pursuit of short-term improvements (Bowen and Shoemaker, 1998; Mathies and Gudergan, 2007; Wang and Bowie, 2009), assessing their outcome throughout an extended time horizon is imperative. However, little discussion has revolved around this topic, as stated by Chen and Chang (2012, p. 1352) that "no previous studies have attempted to identify

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empirically the influence of hotel price instability on hotel financial performance". To the best of the authors' knowledge, only [Noone et al. \(2013\)](#) have empirically investigated the long-run effects of pricing strategies in the context of hotels to date, finding that a higher degree of price fluctuation relative to the competitive set tends to reduce hotel performance, thus concluding that maintaining the consistent relative price over time is indeed a long-run revenue enhancing policy.

Therefore, the objective of this study is to offer additional empirical evidence on the theory of hotel pricing strategy and its long-run consequences, on which only limited literature is available to date. For practitioners, a lack of a full understanding about the short- and long-term consequences of pricing decisions is likely to result in development of suboptimal strategies. Additional understanding of this topic is vital to hotel revenue managers in developing profitable strategies that also ensure business sustainability in the long run.

The current study attempts to extend the contributions of [Noone et al. \(2013\)](#) in two main ways. First, through auxiliary analysis of the data we measure the degree of individual hotels' revenue management as idiosyncratic price movements. Room rates of hotels are outcomes of price competition, product differentiation, and market conditions. Accordingly, in order to better proxy the hotels' pricing strategies, the said effects are partialled-out before obtaining the idiosyncratic movements in price. Second, by utilizing the panel dataset we jointly examine both the contemporaneous and lagged effects of pricing strategies on hotel performance, thereby facilitating understanding on how price adjustments implemented at one period influence hotel performance in the pertaining and following periods (time lagged effects). In order to achieve this, a random effects spatial panel (RESP) model is applied to the data in order to obtain estimates robust to spatial and serial correlation.

2. Literature review

2.1. Systematic and idiosyncratic factors of room rates

The systematic factors affecting room rates of hotels have garnered significant attention from researchers and practitioners. A widely agreed factor is price competition, as hotels take into consideration their competitors' prices when pricing decisions are made ([Schwartz, 1997](#)). While variable cost and the maximum price that guests can tolerate set the two ends of the price spectrum, the final room rates will be determined by price competition in a market ([Shaw, 1992](#)). [Lee \(2015\)](#) provided empirical evidence of price competition among hotels, finding that room rate discounts by nearby competing hotels, such as \$1 discount in average daily room rate (ADR) of neighboring hotels, will likely cause \$0.069 to \$0.178 decrease in the non-discounting hotel's ADR, after controlling for such factors as hotel quality segments, accessibility to transportation hubs, and location attributes.

Another systematic determinant of room rates in the literature is quality differentiation of hotel products (e.g., [Zhang et al., 2011b](#); [Schamel, 2012](#)). Intuitively, lower quality hotel rooms are offered at a lower price, as products of lower quality usually cost less to produce, while a competitive market becomes a limitation of firms' opportunities to charge higher price for the lower-quality products ([Curry and Riesz, 1988](#)). Further, empirical results provide evidence that pricing decisions between hotels of different quality levels are not symmetrical. More specifically, lower-scale hotels offer a deeper discount to inhibit customers from substituting demand to higher-scale hotels for a higher utility, while higher-scale hotels increase room rates relatively less to inhibit customers from substituting demand toward lower-scale hotels with reasonable rates ([Lee and Jang, 2013](#)). Hotels highly differentiated in quality (i.e.,

five star hotels) are founded to enjoy a greater pricing power than less differentiated hotels (i.e., one star hotels), by charging higher prices while protecting their room prices from steeper discounts ([Becerra et al., 2013](#)). In the same line of reasoning, it is found that hotels with fewer services and a lower star rating are associated with more price variations ([Espinet et al., 2012](#)).

Additionally, market conditions, faced with a rapidly changing business environment, have become a vital factor for hotel pricing strategy (e.g., [Hung et al., 2010](#)). In general, market conditions refer to any systematic market condition that affects the hotels in the market as a whole (i.e., economic conditions, events, or seasonality). These external dimensions may not be controlled by management ([Brotherton and Shaw, 1996](#)), but considering the market conditions into hotels' pricing decisions is important. For example, with regard to the terrorist attacks of September 11, 2001, [Cross et al. \(2009, p. 59\)](#) stated that 9/11 "had an immediate and devastating impact on travel, with extraordinary consequences on occupancy and rate. Their influence on the practice of revenue management at hotels had both short-term and long-term effects. The uncertainty of future business after 9/11 may have had an even greater impact on the group and conference side of the hotel than on transient business". As revenue management involves lowering room rates to stimulate hotel sales during low demand seasons, while increasing prices in response to excess demand during high demand seasons ([Relihan, 1989](#)), any economic or social event that cause demand changes will affect room rates of the market of question in a systematic fashion.

In light of the said reasoning, it is logical to think that revenue management of hotels would entail price changes related to all of the above factors—price competition, product quality, and market conditions. Thus it follows that movements of room rates in a specific market may exhibit similarity as they are exposed to the identical systematic factors. Therefore, we posit that the variations in price, not accounted for by these systematic and market effects, is a better reflection of the strategic positions of respective hotels. We define the unsystematic price changes as idiosyncratic, or hotel-specific, price movements. This approach, in which idiosyncratic price movements refer to large price adjustments relative to the factors that researchers generally conceive, is shared by [Nesvisky \(2008\)](#).

2.2. Effect of price movements on short- and long-run performance

A pioneering work on price instability ([Oi, 1961](#)) formulated a theoretical framework with a perfectly competitive, single-product firm faced with an uncertain demand. [Oi's \(1961\)](#) framework is based on assumptions that firms maximize short-term profits each period, and that the marginal cost function is upward sloping. The degree of price instability refers to the extent to which prices change from one period to another period for the economically equivalent product. [Fig. 1](#) illustrates the profit function of a competitive firm adopted from [Oi \(1961\)](#), which is delineated as a monotonically increasing function of total profit (Y), and convex to the axis of price (P). The convexity of the profit function indicates that the addition to total profit increases gradually for any given increase in price. As shown in [Fig. 1](#), the expected profit, \bar{Y}^* , derived from more price variability (from P_a^* to P_b^*) is higher than the expected profit, \bar{Y} , derived from less price variability (from P_a to P_b). Therefore, [Oi \(1961\)](#) concluded that when an uncertain demand takes the form of price instability, price instability yields higher profits for firms than price stability at all events. A later study generalized [Oi's](#) theorem with an n-commodity firm ([Tisdell, 1978](#)).

However, [Tisdell \(1963\)](#) argued that [Oi's \(1961\)](#) model would hold only when firms can immediately adjust production level according to price changes or, when firms always forecast price

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