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The Impact of Renovation Capital Expenditure on Hotel Property Performance

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Abstract

This study investigates the impact of renovation capital expenditure on multiple measures of hotel property performance. We conduct analyses in two time periods: for a 3-year period immediately following renovation (short-term impact), and 3 to 6 years following renovation (long-term impact). The study is based on proprietary project, operational and financial data obtained for 305 renovation capital expenditure projects of individual properties within a single budget hospitality chain. We find renovation capital expenditures offer significant short-term beneficial impact in terms of increased revenue, profitability gains, higher customer satisfaction, and decreased repair and maintenance expense. Altogether, these outcomes should be advantageous to hotel property performance. In the long-term, a significant decline is apparent in revenue and profitability. Surprisingly, customer satisfaction does not decline, and repair and maintenance expense does not increase, which are both favorable.

Keywords

capital expenditure; capital investment; capital budgeting; renovation

The purpose of this study is to investigate the impact of renovation capital expenditure on the four measures of performance: revenue, customer satisfaction (refunds and complaints), repairs and maintenance expense (R&M), and profitability. With hotel renovations typically occurring every 5 to 7 years (International Society of Hospitality Consultants [ISHC], 2015), we analyze performance over two time periods: immediately following a renovation (hereafter referred to as short-term impact) and in the second-half of the renovation life (long-term impact, defined as the period of 3 to 6 years following a renovation). Renovations are of ever-increasing importance as the number of sites to build new hotels decreases (Ruttes, Penner, & Adams, 2001). The results of this research are likely to be of considerable interest to hotel owners, lenders, and practitioners. Furthermore, while our contextual focus is hotels, the findings of our study should be of interest to any service business with perishable inventory (e.g., airlines and cruise ships).

This study was motivated by several factors. First is the importance of capital expenditures to the firm (e.g., Brailsford & Yeoh, 2004; Jiang, Chen, & Huang, 2006; Kerstein & Kim, 1995; Schmidgall, Damitio, & Singh, 1997). Studies conducted across multiple industries have been unable to find consistent, positive performance consequences for capital expenditure (see Busenbark, Wiseman, Arrfelt, & Woo, 2017 for a review). Second, capital investments are of enormous commercial significance to hotels (Guilding & Lamminmaki, 2007), yet improvements are often overlooked (Lynch, 2002). The entire process is frequently seen as a source of frustration and pitfall for owners (Denton & Yiankes, 2004). Third, hotel capital expenditures are often based on how much money there is to spend rather than managers' perceptions of their capital needs (Denton, 1998). Fourth, low capital investment can have a negative impact on a firm's performance (Sharma & Upneja, 2005), but overinvestment increases the likelihood of bankruptcy (Gu, 2002; H. Kim & Gu, 2006). Finally, because an owner bears the burden of failed capital investment (Field, 1995), owners are often concerned with, and act as a barrier to, capital expenditures (Phillips, 2003).

Proprietary project, operational and financial data were obtained for 305 renovation capital expenditure projects of individual properties from 2004 to 2010 within a single budget hospitality chain. By using data from a single chain, we mitigate problems relating to differences in hotel operational structures (owner-operator, management contract, franchise, etc.), ownership type, strategy, and so forth. Our

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findings are that renovation capital expenditures have a significant short-term impact (0-3 years after renovation) in terms of an increase in revenue, profitability, and customer satisfaction, and a decrease in R&M expense. Together, these are beneficial to hotel property performance. In the longer term (3-6 years after renovation), a decline was apparent in revenue and profitability. Unexpectedly, customer satisfaction did not decline and R&M expense did not increase, which are both favorable to the firm. Our results underline the importance of renovation capital expenditure to improve hotel property performance.

The remainder of this article is organized as follows: literature review and hypothesis development, the research site, research methods, results, followed by the discussion and conclusion and limitations and avenues for future research.

Literature Review and Hypothesis Development

Factors critical to the success of any hotel have been identified as including revenue maximization, maintaining high customer satisfaction, and a relentless focus on cost control (Geller, 1985; Jones, 1998). Hotel assets include a building, equipment and furniture, and, in some cases, assets surrounding the hotel (e.g., golf course and retail shops; Field, 1995). Annual capital expenditures are substantial, ranging from 3.9% to 11.6% of gross revenue (see ISHC, 2015). A distinguishing feature of hotel assets is that they require active management of daily operational activities that include R&M, as well as decisions regarding ongoing investment. These attributes make the hotel business a capital-intensive industry (Tsai & Gu, 2012). Renovation capital expenditures are defined as a process of retaining, or improving, the hotel image by additions or replacement of furnishings, fixtures and equipment (Hassanien & Baum, 2001), and/or modifying the tangible product through changes in facility layout (e.g., building expansion).

Revenue

Hotels are characterized by product perishability, fixed capacity, and high customer demand elasticity (F. H. Harris & Pinder, 1995; Kimes, 1989; Weatherford & Bodily, 1992). A high sensitivity to environmental and economic uncertainty (Mia & Patiar, 2001), and little flexibility in supply, means that hotels find it difficult to match short-term supply with demand (Hsu & Jang, 2008; Singal, 2012). Pricing is likely the sole element to cope with short-term demand (F. H. Harris & Pinder, 1995; Heo & Hyun, 2015).

The effect of specific hotel features on room prices has been the subject of prior empirical research (e.g., Bull, 1994; Espinet, Saez, Coenders, & Fluvià, 2003; Haroutunian, Mitsis, & Pashardes, 2005; Thrane, 2007) and a positive correlation has been documented between hotel quality and room rates (Fernandez & Marin, 1998; Israeli, 2002; Rigall-I-Torrent & Fluvià, 2011). The image of a hotel can be significantly enhanced through renovation, and this makes renovations an important marketing tool (Hassanien & Baum, 2002). Watkins (1995) asserted that one of the primary reasons hotels carry out capital expenditure is to remain competitive.

Renovation is a means for a hotel to differentiate itself from its competition (Hassanien & Baum, 2002; Slattery, 1991). A hotel seeks to distance itself from competitors (Economides, 1986; Porter, 1996; Smith, Ferrier, & Grimm, 2001), to reduce direct competition (Porter, 1996) by creating the perception that their product is unique through differentiation (Porter, 1980).

Based on the preceding discussion, capital expenditures should facilitate differentiation for a short period of time after renovation. Hence, we put forth our first hypothesis:

Hypothesis 1a (H1a): Renovation capital expenditure is positively associated with revenue.

After a firm introduces a new product, competitors are inclined to copy the idea. Competitors saturate the market which, in turn, shortens the benefits of a particular product's life cycle (Mia & Patiar, 2001). Given that most markets are competitive (McManus, 2013), the benefits of differentiation through renovation are expected to decline as the duration since renovation elapses. Accordingly, we hypothesize:

Hypothesis 1b (H1b): In the long-term, revenue gains from renovation capital expenditure decline.

Customer Satisfaction

An important concern for a firm is to keep its customers happy (Milla & Shoemaker, 2008). This includes customers' concerns about flaws and failures of the facilities (Losekoot, Wezel, & Wood, 2001). The image of a firm's products and services, its activities and the comfort of its customers, can be undermined if the customer experiences problems. Problems include, for example, broken climate control units, or water leakage, pests, and so on (Chan, Lee, & Burnett, 2001). To avoid these maintenance-related problems, hotels must commit adequate resources to their assets because these directly affect the quality of service (Lee & Jang, 2013).

Capital expenditures minimize flaws and failures, helping the hotel increase business through the acquisition of more loyal guests (Baltin & Cole, 1995). Customers play an active role in initiating capital expenditures through complaints and satisfaction scores (Kirwin, 1992). Bloom (2012) proposed an implicit, positive relationship between a recently renovated hotel and higher guest satisfaction scores. From these findings, we hypothesize that renovation

capital expenditure will be positively associated with customer satisfaction. Formally stated:

Hypothesis 2a (H2a): Renovation capital expenditure is positively associated with customer satisfaction.

In the long-term, older assets may still function as new, however, they will likely lose some of their appeal and usefulness and so the benefits of differentiation decline. Bloom (2012) found a negative correlation between the time elapsed since a hotel's last rooms renovation and overall guest satisfaction. As such, we hypothesize the following:

Hypothesis 2b (H2b): In the long-term, customer satisfaction gains from renovation capital expenditure will decline.

Repairs and Maintenance Expense

R&M is substantial, ranging between 3.4% and 4.7% of gross revenue (ISHC, 2015). Facilities, relative to other investment opportunities, require a disproportionate amount of R&M expense to retain their investment value (Mansfield, 2000). An increase in R&M expense can decrease the need for capital expenditure (Paneri & Wolff, 1994). Excessively high R&M expense may signal that capital expenditure is being deferred, or that the building and its systems are obsolete. Similarly, inadequate R&M leads to premature (and more frequent) equipment failures (Chan et al., 2001). Over a 12-month period, a four-star hotel in Hong Kong reported a total of 17,799 R&M requests, a figure equivalent to 23.6 orders per room year (Lai & Yik, 2012).[1] More specifically, a total of 824 R&M requests were issued per floor of guest rooms that had been renovated in the past 5 years, whereas significantly more (1,169) were issued for those without a renovation in the past 15 years. These findings suggest a negative association between the length of time since last renovation and R&M expense. Ensuring proper building and service systems maintenance is an integral part of an organization's ability to operate effectively (Chan et al., 2001).

Capital assets are a wasting asset by virtue of physical deterioration and obsolescence. Relative to other investment opportunities, capital assets require large (and often frequent) expenditures to keep them in good condition (Mansfield, 2000). Three strategic approaches to R&M have been identified, these being: (a) direct maintenance (also known as breakdown basis), (b) renovation basis, and (c) integration basis (Chan et al., 2001).

The first approach, direct maintenance, consists of reactive and emergency R&M. With direct maintenance, little or no R&M is done until an asset fails. It follows that the more recent the renovation, the less likely is the need for R&M. The renovation basis approach can include modification R&M, which entails the improvement of assets that have reached the end of their useful lives, or no longer provide adequate efficiency. Finally, the integration basis approach is split into total productive R&M and reliability-centered R&M. Productive and reliability-centered approaches focus on reaching reliability targets and optimizing the effectiveness of the R&M system. It is reasonable to assume that the more recent the renovation, the less likely it would be for an optimization R&M expense to be required.

Given the discussion above, we hypothesize a negative association between renovation capital expenditure and R&M expense. However, in the long-term there will be an increase in R&M expense. Accordingly, we make the following predictions:

Hypothesis 3a (H3a): Renovation capital expenditure is negatively associated with R&M expense.

Hypothesis 3b (H3b): In the long-term, R&M expense will increase following renovation capital expenditure, eventually returning to prerenovation levels.

Profitability

Profitability is an important barometer of proposed project performance (Bower, 2017). There are two competing schools of thought regarding the relationship between capital expenditure and firm profitability. The first stems from the seminal research of Modigliani and Miller (1958), which highlights that firms undertake capital expenditure if the investment will maximize firm profitability. Numerous studies support this view (e.g., Bar-Yosef, Callen, & Livnat, 1987; Bates, Kahle, & Stulz, 2009; Cho, 1998; Denis, 1994; Fama & French, 2000; Firth, Malatesta, Xin, & Xu, 2012; Vogt, 1997), and the mere announcement of impending capital expenditure produces excess stock returns for industrial firms (McConnell & Muscarella, 1985).

The second school of thought is that growth in capital expenditures and its covered periods are not always positively associated with the next period profit (Penman, 1992). Capital expenditure can reflect poorly on a firm's future profitability (Abarbanell & Bushee, 1997; S. Kim, 2001). Other studies document a negative relationship between capital expenditure and a firm's current profitability (e.g., Cooper, Gulen, & Schill, 2008; Titman, Wei, & Xie, 2004). The idea is that managers can be inclined to make capital expenditure decisions in their self-interest, consistent with agency theory predications (see Harford, 1999; Jensen, 1986; Jensen & Meckling, 1976).

However, several factors other than agency costs may impact the relationship between capital expenditure and profitability. Some authors advocating an agency theory perspective did not find evidence of capital expenditures leading to decreased profitability (e.g., Mikkelson & Partch, 2003). The nature of the industry can be a determining factor. Lev and Thiagarajan (1993) found that, when controlling

for industry differences, capital expenditure had a positive relationship with profitability for firms in sectors with high capital intensity, a finding consistent with Bloom (2012) who proposed an implicit positive relationship between recently renovated hotels and higher profits. These findings, combined with our predictions for revenue, customer satisfaction, and R&M expense, lead us to posit a short-term positive association between renovation capital expenditure and profitability. Hence, we hypothesize:

Hypothesis 4a (H4a): Renovation capital expenditure is positively associated with profitability.

Although capital expenditures can contribute to a firm's organizational capability to achieve a particular result (Helfat & Peteraf, 2003), capital budgeting theory relies on the idea that the marginal return on capital expenditure declines at some point (Bower, 2017). Indeed, few studies (Bryan, 1997; Jiang et al., 2006; Kumar & Li, 2013) have documented a positive linear relationship between capital expenditure and future profitability. According to the theory of economic depreciation for real estate, the reduced ability of an asset to generate future cash flows dictates that financial benefits erode as assets naturally age and as market conditions change (Blazenko & Pavlov, 2004).

Physical deterioration increases operating expenses and obsolescence "results when older things function as when they were new but otherwise lose their appeal or usefulness" (Margolis, 1981, p. 91). Demand conditions related to customers' nature in terms of their taste, preferences for brands, and unexpected changes in competitors regarding supply conditions can affect the relationship between capital expenditure and firm profitability (Echevarria, 1998). Long-term profitability—and thus survival—is dependent on its capacity to efficiently and readily attend to the changing needs and expectations of its customers (Sin, Tse, Heung, & Yim, 2005). In service industries, capital expenditures are often customer-focused because of their potential to lift profitability through higher levels of customer satisfaction (Hassanien & Baum, 2002).

Furthermore, profit volatility is common in the hotel industry and volatility is caused by external factors such as fluctuating demand, overcapacity of the industry and product perishability (Downie, 1997). The competitive nature of the business requires products to remain contemporary, fresh, and innovative, meaning that aesthetic components (i.e., image, perception and style) are of utmost importance. In forecasting future profits derived from capital expenditure, estimates are often fraught with behavioral biases and cognitive limitations (Arrfelt, Wiseman, & Hult, 2013). This results in estimation errors in terms of timing and magnitude (Cantarelli, Flyvbjerg, Molin, & van Wee, 2008; Flyvbjerg, Holm, & Buhl, 2002), errors that should be more pronounced the further forward they are projected due to uncertainty. Studies have documented considerable deviation between projected estimates and the actual outcomes of capital expenditure (e.g., Merrow, Phillips, & Myers, 1981; Soares, Coutinho, & Martins, 2007; Van Vleck, 1976).

Given the arguments above, and our expectations regarding the long-term impact of renovation capital expenditure on revenue, customer satisfaction and R&M expense, we hypothesize:

Hypothesis 4b (H4b): In the long-term, profitability gains from renovation capital expenditure decline.

Research Site

We focus on the renovation capital expenditure of a single budget hospitality chain with hundreds of owned-and-operated properties. Although there is no single definition for budget hotels (Zhang, Ren, Shen, & Xiao, 2013), the following words are typically used when describing them: no frills, low price, limited facilities, and limited service (Senior & Morphew, 1990).

Our decision to use a single budget hospitality chain provides control along multiple key dimensions. For example, the three approaches to ownership and management are the owner-operator, franchise agreement and management contract (Gannon & Johnson, 1997). Owned-and-operated properties eliminate confounds due to agency problems that occur when contracting capital budgeting issues arise between owners and managers (Guilding, 2003; Turner, 2017; Turner & Guilding, 2010a, 2010b, 2012). In management contracted hotels, owners may involve themselves in the capital budgeting process, but their involvement is mitigated by the degree of power they hold in the owner-manager relationship (Turner & Guilding, 2013). A large, cross-sectional study would be hopelessly confounded by countless variations in strategy, different capital budgeting processes, different incentives, and so on.

Furthermore, renovation capital expenditure decisions at the research site are subject to few agency issues because they are driven from a top–down perspective whereby decisions are made at the division headquarters level.[2] The division has hundreds of hotels within the economy lodging segment. Examples of hotels in this segment include Ibis Budget, Etap, Formule 1, Première Classe, and Premier Inn. Capital expenditure funds are made available by the parent corporation after reviewing capital budgets and having discussions with division executives. The executive committee discusses the allocation of funds with regional managers. Hotel general managers (GMs) are profit center managers that have no significant input to the process. Once a renovation has been approved, a department responsible for facilities visits the properties, develops plans, and manages each capital investment project.[3]

A single strategy is also important since it both shapes, and is shaped by, investments in capital assets (E. P. Harris, Northcott, Elmassri, & Huikku, 2016). With reference to Porter's (1980) generic strategies, the research site is a cost-leader because it strives to be low-cost in its segment of the market (i.e., economy lodging).[4] This is consistent with prior literature, which has identified the success of budget hotels to be attributed to low-cost strategy (e.g., Zhang et al., 2013). Having a low-cost position in a market can be a source of major competitive advantage, but one that requires continual capital investment to protect this position (Bower, 2017). Indeed, while attaining low-cost is important to a budget hotel, they must do so while offering a quality product that keeps customer satisfaction high and leads to positive financial performance (Zhang et al., 2013).

Finally, the budget segment is expanding globally and there has been a lack of research focusing on the factors critical to the success of this important segment (Ren, Qiu, Wang, & Lin, 2016).

At our research site, the firm has been successful in its efforts to minimize costs. To a luxury hotel, cutting costs in terms of euros might be helpful. However, in the economy lodging segment, reducing costs by cents is of paramount importance. Some authors, however, see any competitive strategy (including cost-leadership) as involving a certain degree of differentiation regarding the firm's products and services relative to its competitors (e.g., Mintzberg, 1988).

Research Methods

Data Description

To test our hypotheses, we gathered proprietary panel data from a single budget hospitality chain. A typical property in this segment is around 110 rooms (in the chain we examined, the mean [median] was 113.6 [112.4]). In the year of the renovation, properties in our sample had mean [median] annual sales revenue of €1,388,363 [€1,292,792]. In this segment of the industry, rooms are the only product for the hotel.[5] Each hotel is a profit center (i.e., the GM is held accountable for profits since they undertake decisions that affect both revenues and costs) and the GM is responsible for daily operations of the property. Investment decisions are made at the division level and capital expenditure projects (mainly renovations, but major R&M due to storms) are handled by a project engineering department. Each year, the company has a pool of capital available for renovation and those funds are divided among the properties. A senior management committee undertakes an annual, formal review process identifying properties to be sold, acquired, or renovated. The mean [median] project cost for renovations was €589,928 [€515,852].[6] The mean [median] cost per room is, therefore, €5,193 [€4,589].

Most renovation projects are completed in December, followed by April and May. Hotels seek to avoid undertaking renovations during peak periods, as this would result in customers being turned away. By beginning a renovation project in late August, or completing a renovation project by May, the company has available all rooms before the beginning of the busy summer travel season. As these are small properties, renovation project durations are short, and rooms are phased out of service in small groups. The mean [median] project duration is 117.9 [114] days, with a standard deviation of 67.8 days. In other words, projects ending in December usually began at the end of the summer season, in late August. Similarly, projects ending in April and May typically started in the months of December and January, respectively.

Figure 1a shows the mean revenue per available room (REVENUE) and profit per available room (PROFIT) over time. Figure 1b depicts product price (i.e., average daily room rate [ADR]) and occupancy (i.e., capacity utilization, defined as rooms sold divided by rooms available). From these graphs, one readily perceives the seasonality of the hospitality industry and gradual changes due to the economy. With seasonality and longer term changes, we incorporated quarter and year dummies in the regression models testing our hypotheses to control for these variations, respectively.

From the firm's project engineering department, we obtained a spreadsheet of all company room renovation projects undertaken.[7] Projects with start dates before and after the availability of operational data were dropped (n = 156). Projects for acquired properties were dropped because prerenovation data were unavailable (n = 18). Five projects were new construction (i.e., did not exist prior to the project and were not renovations) and these were dropped. A small number of properties had multiple renovations and, since a single "event" could not be isolated, these projects were also dropped. This resulted in a final sample of 305 renovation projects.

Research Design—Testing Hypotheses

To test our hypotheses, we estimate the following five models of revenue (REVENUE), customer satisfaction (REFUNDS and COMPLAINTS), repairs and maintenance (REPAIRS), and profitability (PROFIT):

$$\begin{aligned}\text{REVENUE}_{it} = \beta_0 + \sum_{k=1}^{305}\zeta_k \text{PROP}_k + \sum_{q=2}^{4}\xi_q D_q + \sum_{t=2}^{7}\eta_t Y_t \\ + \beta_1 \text{CAPEX}_{it} + \beta_2 \text{CAPEX2}_{it} \\ + \beta_3 \text{CREV}it + \varepsilon_{it},\end{aligned} \tag{1}$$

$$\begin{aligned}\text{REFUNDS}_{it} = \beta_0 + \sum_{k=1}^{305}\zeta_k \text{PROP}_k + \sum_{q=2}^{4}\xi_q D_q + \sum_{t=2}^{7}\eta_t Y_t \\ + \beta_1 \text{CAPEX}_{it} + \beta_2 \text{CAPEX2}_{it} + \varepsilon_{it},\end{aligned} \tag{2}$$

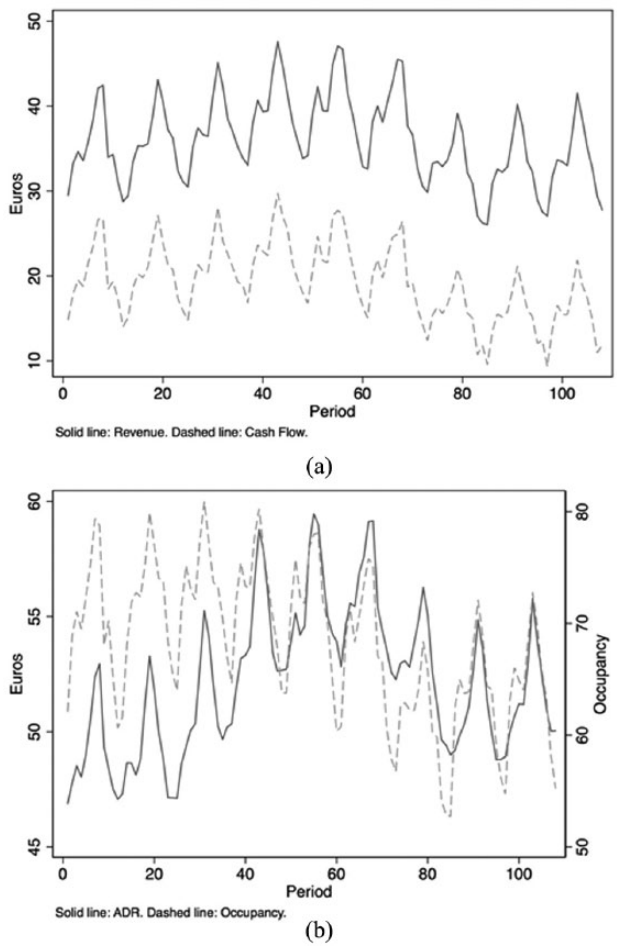

Figure 1.
(a) Revenue and Profit (Cash Flow) Performance by Month; (b) Rate and Occupancy Performance by Month.
Note. ADR = average daily room rate.

$$\text{COMPLAINTS}_{it} = \beta_0 + \sum_{k=1}^{305} \zeta_k \text{PROP}_k + \sum_{q=2}^{4} \xi_q D_q + \sum_{t=2}^{7} \eta_t Y_t + \beta_1 \text{CAPEX}_{it} + \beta_2 \text{CAPEX2}_{it} + \varepsilon_{it}, \quad (3)$$

$$\text{REPAIRS}_{it} = \beta_0 + \sum_{k=1}^{305} \zeta_k \text{PROP}_k + \sum_{q=2}^{4} \xi_q D_q + \sum_{t=2}^{7} \eta_t Y_t + \beta_1 \text{CAPEX}_{it} + \beta_2 \text{CAPEX2}_{it} + \varepsilon_{it}, \quad (4)$$

$$\text{PROFIT}_{it} = \beta_0 + \sum_{k=1}^{305} \zeta_k \text{PROP}_k + \sum_{q=2}^{4} \xi_q D_q + \sum_{t=2}^{7} \eta_t Y_t + \beta_1 \text{CAPEX}_{it} + \beta_2 \text{CAPEX2}_{it} + \beta_3 \text{CREV}_{it} + \varepsilon_{it}, \quad (5)$$

where k, $i = 2, 3, \ldots, 305$, indexes the property q, $q = 2, 3, 4$ is for quarters, and t, $t = 1, 2, \ldots, 108$, indicates the monthly period. We drop observations occurring more than 72 months away from the renovation time period. We also drop observations during the period of renovations. This left us with a maximum of 29,875 property-month observations.

We control for serial correlation in our time-series data using clustered standard errors. We do this since most procedures to correct for serial correlation and/or heteroscedasticity work well only if the time period, T, is quite large (Wooldridge, 2011). Clustered standard errors are robust to heteroscedasticity and any form of serial correlation (Wooldridge, 2011).

Dependent Variables

The dependent variables are REVENUE (Model 1), REFUNDS (Model 2), COMPLAINTS (Model 3), REPAIRS (Model 4), and PROFIT (Model 5). Descriptive statistics and correlations are provided in Tables 1 and 2, respectively.

Model 1. Compared with properties in a deteriorated state, well-maintained hotels should, *ceteris paribus*, command higher prices and occupancy. Pricing and occupancy are the components of total revenue. To control for property size, we calculate revenue per available room (REVENUE) as total revenue divided by the number of rooms available. This measure is a commonly used performance metric in the hospitality industry (i.e., RevPAR). Mean REVENUE is €36.00 with a standard deviation of €12.34.

Model 2. Guest refunds is one of two measures for guest (dis)satisfaction. Customers who have had a bad guest experience may request a refund. Refunds are given for many reasons, but the common ones include cleanliness, noise, and nonworking items (television, air conditioning, etc.). Refunds take place at the property upon checkout, where they are at the discretion of the GM, or by contacting company headquarters. Most refunds handled through corporate headquarters are processed within days so only a small amount of refunds carry over to the next month. Our measure, REFUNDS, is the sum of these amounts listed on the income statement divided by the number of rooms rented. The mean of guest refunds is €0.21/room rented and the standard deviation is €0.31/room rented.

Model 3. Our second measure of guest (dis)satisfaction, COMPLAINTS, is the log transformation of one plus the total number of complaints received by customers divided by the number of rooms rented and multiplied by the median number of room-nights available annually. Dividing by the number of rooms rented controls for volume differences across hotels (i.e., busier, larger hotels necessarily have more complaints) while multiplying by the median annual rooms available scales the measure to something close

Table 1.
Descriptive Statistics.

Variable	*n*	*M*	*SD*	*Q1*	Median	*Q3*
REVENUE	29,875	36.00	12.34	27.37	34.07	42.47
REFUNDS	29,855	0.21	0.31	0.07	0.15	0.28
COMPLAINTS	22,836	31.59	34.01	0.000	23.40	46.28
REPAIRS	29,875	1.70	1.05	1.05	1.52	2.15
PROFIT	29,875	19.17	10.94	11.76	17.51	24.84
CREV	20,628	40.44	17.80	28.05	36.86	48.93

Note. Amounts for financial measures are in Euros (€) have been scaled to protect proprietary data. REVENUE is the monthly property RevPAR. REFUNDS is the sum of monthly guest refunds divided by the number of rooms rented. COMPLAINTS is one plus the total number of customer complaints divided by rooms rented, and this sum is multiplied by the median number of annual rooms available. REPAIRS is total monthly R&M expense per available room. PROFIT is monthly controllable profit minus allocated corporate costs, per available room. CREV is monthly average RevPAR of each property's competitor set. RevPAR = revenue per available room; R&M = repairs and maintenance.

Table 2.
Correlation Matrix.

Variable	1	2	3	4	5	6
1. REVENUE	—	.10**	.11**	.15**	.94**	.70**
2. REFUNDS	.11**	—	.15**	.12**	.06**	.12**
3. COMPLAINTS	.09**	.13**	—	.08**	.10**	.12**
4. REPAIRS	.13**	.09**	.07**	—	.01**	.09**
5. PROFIT	.94**	.06**	.08**	−.01**	—	.70**
6. CREV	.75**	.14**	.14**	.08**	.75**	—

Note. Pearson coefficients below the diagonal, Spearman coefficients above. Complete case analysis. REVENUE is the monthly property RevPAR. REFUNDS is the sum of monthly guest refunds divided by the number of rooms rented. COMPLAINTS is one plus the total number of customer complaints divided by rooms rented, and this sum is multiplied by the median number of annual rooms available. REPAIRS is total monthly R&M expense per available room. PROFIT is monthly controllable profit minus allocated corporate costs, per available room. CREV is monthly average RevPAR of each property's competitor set. RevPAR = revenue per available room; R&M = repairs and maintenance. $^{**}p < .05$.

to the actual number of annual complaints. Complaints include, among others, rate disputes, unavailability of rooms, unprofessional staff conduct, no-show disputes, and so on.[8] Finally, we use the log transformation to adjust for a significant right skew in the raw measure. The mean and standard deviation of COMPLAINTS is 31.59 and 34.01, respectively.

Model 4. The dependent variable in our fourth model, REPAIRS, is the total monthly R&M expense per available room. R&M expense averages €1.70 and has a standard deviation of €1.05 per available room. R&M include replacement of room furnishings (lamps, televisions, etc.), building repairs (exterior painting, replacement of damaged structure, etc.), plumbing expense (leaking pipes, worn washers, damaged fixtures, etc.), cleaning supplies (for maintenance, not housekeeping supplies), rooms walls (painting and repair damages), laundry and boiler (parts and labor for repairs, including maintenance contracts on these items), snow removal, electrical, and fire protection equipment.

Model 5. We obtained a profit-and-loss statement for each property. These statements are for the evaluation of GMs and with few exceptions, do not assign expenses outside the GM's control (e.g., depreciation, interest expense and corporate support). By removing these few accounts (line items), we are able to estimate each property's monthly controllable profit (i.e., cash flow).[9] As with our first model, we scale the profit measure by rooms available. The mean and standard deviation are €19.17 and €10.94, respectively. As monthly profit is, like revenue, skewed, the dependent variable PROFIT is the natural logarithm of profit per available room.

Independent Variables

The primary variables of interest are CAPEX (impact for a 3-year period immediately following renovation—short-term impact), and CAPEX2 (differential impact 3 to 6 years following renovation—long-term impact). The variables indicate the extent to which the renovation projects increase revenue and profits and decrease R&M, refunds and guest complaints. We limit the time series to 6 years prior to renovation (i.e., 72 months) and 6 years after renovation (i.e., 72 months). CAPEX is 0 from the beginning of the time series until the month prior to the beginning of the renovation project, and 1 after the end of the renovation project. As mentioned above, we dropped observations during the renovation period.

Our hypotheses predict performance will deteriorate over time. To assess this impact, a second dummy variable, CAPEX2, is added. It is 0 until the 37th month after the renovation and 1 for the remainder of the time series of each property. The overall impact 3 years after the renovation is, therefore, the sum of the CAPEX and CAPEX2 coefficients. The appendix provides additional description regarding how the CAPEX and CAPEX2 independent variables have been operationalized.

As revenues and profits are influenced by the economy, we incorporate the revenue per available room of each hotel's competitive set (CREV). CREV is a control variable in the REVENUE and PROFIT models. The CREV refers to competitors identified by the hotel for each property and time period. The company contracts with a third-party benchmarking firm (e.g., MKG Group and CBRE) that provides monthly market data for the identified competitors. More than 95% of the market's rooms rented are

Table 3.
Impact of Renovation Capital Expenditures on Financial Outcomes.

	Model 1 REVENUE	Model 2 REFUNDS	Model 4 REPAIRS	Model 5 PROFIT
CAPEX	0.914**	−0.003	−0.229***	1.452***
	(2.39)	(–0.26)	(–5.68)	(4.14)
CAPEX2	−1.147***	−0.019*	0.013	−0.648**
	(–3.70)	(–1.72)	(0.40)	(2.37)
CREV	0.528***			0.475***
	(39.93)			(36.34)
Year controls	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes
R^2	.746	.048	.025	.697
n	20,628	29,855	29,875	20,628

Note. Unstandardized coefficients. The *t* statistics in parentheses. Clustered standard errors that are robust to autocorrelation and heteroscedasticity.
*$p < .10$. **$p < .05$. ***$p < .01$.

tracked by the benchmarking firm so the data does not have self-selection issues. From aggregate competitor revenue and rooms available, we construct CREV.[10] Mean CREV is €40.44 with a standard deviation of €17.80.

Furthermore, we add dummy variables for each property, for each year and for each quarter. The property dummy variables capture the effect of unobservable, time-invariant factors for each property. The year dummy variables capture the effects of changes occurring across each year. Finally, the hospitality industry exhibits significant seasonality, as shown in Figure 1. Quarterly dummy variables capture any shifts due to seasonality.

Results

Our formal tests of the hypotheses are the regression coefficients of the CAPEX and CAPEX2 variables. From Tables 3 and 4, we observe that CAPEX is positive and significant in the REVENUE model ($b_1 = 0.914$, $p < .05$), thus supporting H1a. This means that, after renovation, the mean increase in revenue per available room is €0.914. After 3 years, revenue per available room is declining as CAPEX2 is negative and significant ($b_2 = -1.147$, $p < .01$), which is supportive of H1b. Combining b_1 and b_2, we see the overall effect is a decline in revenue starting 3 years after renovation.[11]

For our two measures of customer (dis)satisfaction, the coefficient on CAPEX is negative and significant at the $p < .10$ level (two-tailed) for complaints. With a prediction that refunds and complaints should decline (i.e., customer satisfaction should increase), the coefficient on complaints is significant at the conventional $p < .05$ level using a one-tail test. The coefficient on refunds is not significant, although its sign is negative. Overall, this provides support for H2a. For refunds, the coefficient on CAPEX2 is negative and significant ($b_2 = -0.019$, $p < .05$, one-tail) indicating that refunds continue to remain low 3 years following renovation. For complaints, the coefficient for CAPEX2 is nonsignificant indicating no change in the number of guest complaints across time. As there is no decline in customer satisfaction after 3 years, H2b is not supported.

Table 4.
Impact of Renovation Capital Expenditures on Nonfinancial Outcomes.

	Model 3 COMPLAINTS
CAPEX	−0.106*
	(–1.68)
CAPEX2	0.007
	(0.07)
Year controls	Yes
Quarter dummies	Yes
Fixed effects	Yes
R^2	.039
n	22,836

Note. Unstandardized coefficients. The *t* statistics in parentheses. Clustered standard errors that are robust to autocorrelation and heteroscedasticity.
*$p < .10$. **$p < .05$. ***$p < .01$.

For our model of R&M expense, the coefficient on CAPEX is negative and significant ($b_1 = -0.229$, $p < .01$), meaning that R&M expense declines immediately after renovation, a finding that supports H3a. As the coefficient on CAPEX2 is nonsignificant, we find no evidence that R&M expense increases after 3 years. Hence, there is no support for H3b.

For the profitability model, a large, positive and significant ($b_1 = 1.452$, $p < .01$) coefficient for the relationship between CAPEX and profitability is supportive of H4a.

After renovation, profits improve by €1.452 per available room. Over a longer term, the coefficient b_2 for CAPEX2 is significant and negative ($b_2 = -0.648$, $p < .05$), a result that supports H4b. However, since the coefficient b_2 for CAPEX2 is less than the coefficient b_1 for CAPEX, the overall effect 3 years after renovation is a continued (but reduced) improvement in profit.

Discussion and Conclusion

The results of this study are expected to be of considerable interest to hotel owners, lenders and practitioners. In the short-term, we found a significant beneficial increase in revenue, customer satisfaction and profitability. We also observed a significant favorable decrease in R&M expense immediately following renovation capital expenditure. In the long-term, the early revenue and profitability increases are largely reversed. However, customer satisfaction did not decline and R&M expense did not increase, which are both advantageous outcomes. Moreover, we find empirical support for a positive association between hotel customer satisfaction and financial performance.

Interpreting the results of this research, corporate finance theory assumes that project selection is rational and should result in improved firm performance (Kothari, Ramanna, & Skinner, 2010). Nevertheless, challenges arise because in the real-world as capital expenditure decisions are complex (Bower, 1970; Bromiley, 1986; King, 1975; Marsh, Barwise, Thomas, & Wensley, 1988), messy, iterative and only partly rational (Braybrooke & Lindblom, 1963; Hickson, Butler, Cray, Mullory, & Wilson, 1986; King, 1975; Mintzberg, Raisinghani, & Thoeoret, 1976; Quinn, 1980). Within the context of hotel properties, several studies have also demonstrated considerable deficiencies in the capital expenditure decision-making process (e.g., Turner, 2017; Turner & Guilding, 2010a, 2010b, 2012, 2013).

From these perspectives, we contribute to understanding the impact of renovation capital expenditures on multiple measures of hotel property performance, not on predicting optimal levels of renovation capital expenditure.[12] Despite capital expenditure decisions being of enormous commercial significance, there is limited prior research on this topic (Guilding & Lamminmaki, 2007). Spending too little leads to declining profitability, value, and star-rating (Bader & Lababedi, 2007). Similarly, it is possible to spend too much, such that residual income declines or becomes negative (i.e., the increase in profit is less than the cost of additional capital). Owners may act as a barrier to overinvestment for two reasons: (a) they may not see the value of capital expenditure (Hassanien & Losekoot, 2002); and/or (b) owners know they bear the burden of a failed capital expenditure project (Field, 1995). Most managers, however, believe that limiting capital expenditure harms a hotel's long-term competitiveness (Bader & Lababedi, 2007).

It is important to recognize that hotel owners do not have the same investment time horizon, opportunities, funds or investment goals. Turner and Guilding (2014) highlighted that hotel owners' investment time horizons range from short-sighted (5 years or less) to long-term (10 or more years). Owners with a short investment time horizon, categorized as being "opportunity funds" (e.g., Morgan Stanley), are typically characterized by a strategy of "buy low and sell high." Capital investment decisions for this class of owners are more tactical than strategic (Davis & deRoos, 2004). This quote is illustrative:

> . . . they often look for opportunities such as to "Buy at a great price, throw a lot of money at it, lift the performance up . . . do whatever they do, get out in a three to five-year period, take the profit and go. These guys are not interested in maintaining the long-term integrity of the hotel." (Turner & Guilding, 2014, p. 79)

Conversely, owners with a long investment time horizon (categorized as "institutions") are traditionally more risk-averse and are not concerned with quick returns—institutional owners are interested in the consistency of returns (Turner & Guilding, 2014).

It is surprising that few owners have short investment time horizons. It seems likely that opportunity funds, by virtue of being in the banking sector, either: (a) can more easily procure funding required to "throw a lot of money at it" (Turner & Guilding, 2014, p. 79), or (b) simply assume greater risk consistent with the expectations of their shareholders.

The investment behavior of short-term owners suggests that they see significant merit in a strategy of high capital expenditure. A key obstacle for many hotel owners, however, is that their hotels "are considered one of the riskiest types of real estate to lend against" (Hochstein, 1999, p. 13) due to high operating leverage. Procurement of borrowed funds to carry out renovation projects may therefore be necessary. Hotel lenders are usually cautious, often placing great importance on "good hotels and people with a track record" and forcing owners to jump through more hoops than the lender's nonhotel borrowers (Brandt, 2001, p. 14). Lenders are increasingly assuming active roles in interactions with hotel owners, and frequently resort to restrictive covenants when extending funds to minimize risk (Crandell, 2002; Denton, 1998; Wilder, 2004).[13] These might be important points because capital budgeting is based on the idea that a firm has a range of project proposals for funding, which must compete for funding given that there is usually a limited amount of internal capital available (Bower, 2017). The pecking-order theory of finance (Myers, 1977, 1984, 2001), for example, highlights that to fund capital expenditure, firms first access internal methods of financing before turning to costlier outside debt.

We reiterate that our research site used a cost-leadership business strategy. Hence, a plausible explanation is that since they were a cost-leader, the firm did not commit to a higher level of R&M expense as properties deteriorated. In turn, management appears to have decreased pricing to be commensurate with the decline in room quality to satisfy customer value expectations. As customers in limited-service hotels tend to seek discounts (Tanford, Raab, & Kim, 2011), their strategy is likely optimal. The net impact on profitability is, however, unknown and unknowable.

Finally, one fact remains: Hotel properties are organizations characterized by buildings that are complicated and costly to maintain (Chan et al., 2001). As soon as a hotel opens, managing capital expenditure becomes an integral part of its management if it is to become successful (Paneri & Wolff, 1994). To remain competitive, and for the industry to grow, it seems that efforts need to continue to be made to attract greater investment. One way to improve this will be to extend our understanding regarding the outcomes of hotel capital expenditure. The results of this current study should move the industry further toward this goal.

Limitations and Avenues for Future Research

As we do not have project data on other hotel types (e.g., luxury or midscale), we cannot make strong claims regarding the generalizability of our results to other hotel types and different markets. Recall that the success of budget hotels tends to be attributed to a low-cost strategy (Zhang et al., 2013). It would therefore be worthwhile conducting a similarly focused study of luxury hotels, as the greater likelihood of adopting a differentiation strategy might lead to different results. The renovation frequency of competitors, for example, to the extent it varies by segment, would likely impact model coefficients and interpretation. To get a sense of renovation frequency, it may be helpful to think of the airline industry. Aircraft interiors are often refurbished when an aircraft undergoes a "D-check," typically every 5 to 6 years. Nevertheless, we have attempted to control for these as far as possible. For example, market conditions—if there are unanticipated changes in the hotel market, such as an economic downturn, normative commentary suggests that a strategy of high capital expenditure may not deliver increased property value or an infusion of revenue as desired (Williams, 1997). Hence, our results will no doubt have been influenced by the prevailing market conditions over the years of the study investigated. We also call for similarly focused research to be undertaken that centers on the multiple properties of multiple organizations. This may well be quite illuminating, for example, to examine the impact of different hotel ownership types, and hotel operational structures, as well as hotels in different segments of the market and with different strategies on the outcomes of capital expenditure.

Appendix

Operationalization of the CAPEX and CAPEX2 Coefficients

We selected a 6-year window for our models since most hotels undergo significant renovation expenditure every 5 to 7 years (ISHC, 2015). We confirmed this was true at our research site using two approaches. Our first approach at validation took into consideration that industry practice, for many years, used a 3% reserve for the replacement of furniture, fixtures, and equipment (FF&E; ISHC, 2007).[14] Scholarly research, however, highlights the deficiency of a 3% reserve account and puts the actual amount spent on FF&E at something closer to 5%, although this varies by hotel type and location (see Turner & Guilding, 2010a). In recent years, our research site established a renovation reserve of 6.5%, although this varied slightly across properties. With a mean RevPAR of €36.00 (Table 1), mean hotel size of 114 rooms, and mean annual revenue of €1,497,960, and a 6.5% reserve, the typical property would set aside €97,367 annually. With a mean renovation expense of €589,928, the company will have set aside the cost of renovation after a period of 6.06 years.

Our second approach is more direct since having a reserve does not guarantee that management will renovate properties every 6 years. Accordingly, we examined the proportion of renovations actually performed. Each year the firm selects properties for closure. Properties designated for closure will not undergo a renovation. Using the list of properties designated for closure, we calculated that the firm renovated approximately 14% of their network each year. This corresponds to a renovation cycle of 7 years.

The decision to incorporate a 3-year dummy variable is a recognition that the greatest effect of renovation capital expenditure would likely occur in the months immediately following project completion. Although we anticipate the benefits of renovation will decline over time, we have no reason to believe the decline will be linear. Adding multiple dummies would amount to over-controlling for time effects, and a detailed description of the time effects is not of primary (or even secondary) interest. CAPEX2 allows us to estimate the impact from the half-life point (3 years) till the next renovation cycle by summing its coefficient to the coefficient on CAPEX (the impact immediately following renovation to the anticipated "half-life" of the renovation).

In our model, CAPEX is equal to zero prior to renovation and one thereafter. In a model without CAPEX2, this dummy (indicator) variable would then capture the mean shift in the dependent variable that occurs after renovation. The variable CAPEX2 is equal to zero for the earliest time period (t) prior to renovation up to the time period 36 months after renovation. From month 36 onward, CAPEX2 takes on the value 1. Assume that the renovation project

Table A1.
Construction of CAPEX and CAPEX2 Dummy Variables.

t	CAPEX		CAPEX2
−7	0		0
...			
−4	0		0
−3	0		0
−2		dropped	
−1		dropped	
0		dropped	
1	1		0
2	1		0
...			
35	1		0
36	1		1
37	1		1
...			
72	1		1

took 3 months (i.e., $-2 \leqslant t \leqslant 0$). Recall that these observations are dropped. Table A1 illustrates the construction of CAPEX and CAPEX2 in our dataset.

The variable CAPEX2, from month 36 onward, captures the impact of the renovation in conjunction with CAPEX (i.e., CAPEX + CAPEX2). This approach allows us to estimate the immediate, or short-term, impact of the renovation and a long-term impact resulting from an "increasingly distant" property renovation.

The idea behind our model is that, when a hotel looks new and "fresh," it should be able to command a higher price and perhaps gain higher occupancy.[15] Our model seeks to capture the initial impact from a "fresh" offering (CAPEX) along with the impact remaining from the half-life of the renovation until the end of the cycle (CAPEX + CAPEX2) as the product deteriorates.

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Notes

1. The majority of work orders (81.9%) related to guestroom repairs and maintenance expense (R&M).
2. Notwithstanding the top–down nature of capital investment decisions at the research site, it is to be noted that this may not fully mitigate agency problems. For example, headquarters' managers may still shirk responsibility or make investment decisions that are not aligned with the interests of owners, thus causing agency problems. However, with relatively few managers for a large sample of capital expenditure decisions, the potential confounds are few.
3. As all hotels are part of the same brand, and therefore similar, there is little variation from project to project. Different locations may have regulations to comply with local wages for trades and subcontractors may differ, and some older properties may have different characteristics, but overall renovation costs and timing exhibit little variation. As most hotels have high occupancy during the summer months, and lower occupancy during winter months, most projects begin after the peak summer season. As these are small hotels (typically less than 150 rooms), most renovations are completed in a single time period without closing the hotel; that is, with little or no loss of business.
4. Cost leadership focuses on efficiency, cost reduction and controls, whereas differentiation is focused on creating the perception that one's product is unique (Porter, 1980).
5. There are no meeting rooms, no food and beverage outlets, no banquet facilities, and so on. A very small level of revenue (<1%) is obtained from self-service laundry, vending machines, and Wifi access.
6. We excluded new construction projects and R&M due to storms (flooding, earthquakes, etc.). This leaves us with the renovation projects.
7. These projects consist of room updates (e.g., new furnishings, flooring, painting, and fixtures) and lobby updates (e.g., new flooring and new signage). Although the company also undertakes expenditures to replace broken or aging major assets (e.g., broken boilers, damaged or aging roofs, and R&M due to structural damage), we focused solely on "renovations." Room renovations are recurring investments where discretion is possible with regard to timing and amount of expenditure, and for these projects customers are directly impacted by the project. Other project types are relatively uncommon as boilers and roofs have much longer service lives, and damaged assets are usually reimbursed through insurance policy claims.
8. Although the reasons for complaints may be the same that trigger a customer's refund request, complaints do not necessarily translate into guest refunds. Most customers who have a problem will approach the front desk during their stay or at checkout to express their dissatisfaction. If the front desk resolves the issue, a customer (whose payment was refunded) is not likely (but is able) to register a complaint. Pareto analysis of complaints indicates that more than half are due to customers being locked out for nonpayment, police involvement, refusal to rent (e.g., due to no identification), a no-show dispute (where a charge was made to a customer's credit card for failure to cancel a reservation). The common reasons for guest refunds, as mentioned above, are issues related to the room. Accordingly, we believe it is important to analyze these constructs separately. One can argue that renovation capital expenditure should have little impact on customer complaints. However, this makes our test more conservative.

9. As a service firm, there is very little inventory of supplies. Furthermore, virtually all sales (>99%) are handled in cash or cash equivalents that are settled in the month of sale. Also, there are a small number of accounting errors that occur randomly. Taken together these are random and small, hence we state the measure is a good estimate of monthly profitability.
10. Data for the competitive set (CREV) were not available for all property-years and, therefore, we lose a modest number of observations in the regression models for REVENUE and PROFIT.
11. Our model controls for events around each property by including the RevPAR of the hotel's CREV. The fixed effects model controls for time-invariant characteristics of each property. However, it may be possible there are company-specific factors that vary systematically across geographic regions. To rule out this possibility, we constructed a grid and examined the mean standardized residual for properties within each region. We observed no systematic patterns among these spatial errors and concluded that there is no evidence that our results are impacted by regional differences among the sample properties.
12. The following are some examples of studies that seek to predict the optimal level of capital investment. Cleary (1999) focused on liquidity-related items including cash flow and current ratios to predict investment in fixed assets. Another study by Perotti and Gelfer (2001) used firm profitability to predict investment in fixed assets. Alternatively, in restaurants Upneja and Sharma (2009) demonstrated the importance of liquidity in predicting investment in fixed assets. Finally, Dogru and Sirakaya-Turk (2017) examined whether an optimal investment level exists in hotel firms and that it varies across firms on the basis of the quality of investment opportunities or under- and overinvestment problems.
13. Hotel real estate debt financing has typically come from commercial banks (Toman, 2006).
14. A large portion of the renovation project capital expenditure at our research site relates to FF&E replacement; that is, replacing beds, television, bathroom fixtures, paint for interior and exterior walls, carpeting, and so on.
15. Although economic theory tells us that higher prices lead to lower demand, a newly renovated product offering (e.g., hotel room or airline seat) is not the same product as the old, worn-out product. Depending on the competitors and customer demand, it is possible the firm could obtain both higher prices and higher sales volumes (i.e., occupancy).

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