

Do Private Equity Investors Create Value? Evidence from the Hotel Industry*

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Abstract

We dissect possible mechanisms of private equity (PE) value creation by studying the U.S. hotel industry. We observe acquisitions, dispositions, and granular operating performance data for several thousand hotels owned by PE and non-PE investors over the past two decades. PE-owned hotels experience only limited operating efficiency gains, and no change in bottom-line profit measures on average. Nonetheless, PE investors earn above-average capital gains on their hotel real estate investments. They do so by acting as arbitrageurs, selling to counterparties with high valuations. Finally, PE investors' returns to equity are boosted by their superior access to cheap financing.

JEL CLASSIFICATION: G11, G24, G32, R33.

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1 Introduction

Proponents of the private equity (PE) investment model argue that PE ownership improves the operating efficiency and the valuations of target firms.¹ Yet, the empirical evidence on the value created by PE investors is mixed.² Regardless of their diverging conclusions, existing studies on both sides of the argument face similar empirical challenges. Researchers either use fund-level cash flows and capital values to measure the overall financial performance of PE investments, or they use asset-level data to focus on specific changes effected by PE investors in their target firms. In the former case, the PE investment model remains a black box, and little insight can be gleaned into the ways in which PE investors create value. In the latter case, it remains unclear whether any of the specific improvements made by PE investors lead to overall outperformance over their competitors.

In this paper, we make progress in addressing the empirical challenges associated with analyzing value creation by PE investors. We do so by focusing on PE investments in the hotel industry. Our chosen setting offers two distinct advantages. First, acquiring a hotel involves buying the real property that houses the hotel operations. Such real estate transactions are a matter of public record. We obtain a near-universal data set of hotel deals completed in the U.S. over the past two decades from Real Capital Analytics (RCA), the leading provider of commercial real estate transactions information. In the RCA transactions records, we observe the dates when, and the capital values at which, investors buy and sell individual hotel assets, hotel portfolios, and legal entities owning hotel real estate assets. Importantly, RCA identifies those investors by name and classifies them

¹The mechanisms driving such improvements may include superior alignment of incentives between owners and managers (Jensen (1986, 1988)), wealth transfers to investors from productivity gains (Shleifer and Summers (1988)), and private information about firm value (Lowenstein (1985)).

²Studies presenting results consistent with the the narrative of superior value creation by PE investors include Acharya et al. (2013), Biesinger et al. (2020), Davis et al. (2014), Guo et al. (2011), Harris et al. (2014), and Kaplan and Sensoy (2015). Critical voices call into question the degree to which PE investors outperform other investor types (see Leslie and Oyer (2008), Morris and Phalippou (2020), and Phalippou (2020)). Additional criticisms of the PE model include variability in firm growth and productivity gains (Davis et al. (2019)); a tendency to overpay for acquisitions (Axelson et al. (2013)); and the pursuit of financial gains at the expense of consumers and other non-financial stakeholders (Eaton et al. (2019) and Gupta et al. (2020)).

into granular investor types, allowing us to observe the ownership history of the sample hotels and to distinguish between PE and non-PE hotel owners. Second, hotel operators commonly participate in asset-level performance benchmarking programs. These surveys collect detailed accounting data on hotel operating performance following a harmonized reporting system (Uniform System of Accounts for the Lodging Industry, USALI). Under USALI norms, hotels submit itemized data on all revenues and expenses associated with their operations, allowing us to observe in detail the growth and efficiency of those operations, as well as the net cash flows to hotel owners. Specifically, we use hotel operating data from the consulting company CBRE Hotels, which runs the most long-standing and comprehensive annual hotel performance benchmarking survey in the U.S. We merge the RCA and CBRE records to create a novel data set that integrates asset-level transactions and ownership information with annual hotel operating performance data. We then employ a difference-in-differences framework to comprehensively assess the asset-level investment performance of PE-owned (“subject”) hotels against that of characteristic-matched (“control”) hotels backed by other investor types, and to simultaneously evaluate the relative effectiveness of different PE value creation strategies.

One strategy PE investors may pursue is to target underperforming firms (Cohn et al. (2020)) and engineer an operational turnaround by stoking firm growth (Fracassi et al. (2020)). Our first empirical result is that the operating performance of the hotels that are eventually acquired by PE investors is statistically indistinguishable from that of their characteristic-matched control hotels that don’t receive PE funding throughout the five years leading up to the PE investments in the subject hotels. Moreover, we show that under PE ownership, key drivers of hotel revenue growth—notably, average daily room rates and occupancy—remain indistinguishable from those of their characteristic-matched peers owned by other investor types for up to five years following the PE acquisitions of the subject hotels. Our findings suggest that, relative to other hotel investor types, PE investors

neither identify underperforming targets, nor do they generate superior hotel revenue growth post-acquisition.

Aside from revenue growth, PE investors are often credited with achieving operating efficiency gains in their target firms (see Acharya et al. (2013) and Bernstein and Sheen (2016)). Prior studies attribute such gains to superior management practices (see, e.g., Bloom et al. (2015)). We find limited evidence for improvements in hotel operating efficiency under PE ownership, with one exception: PE-owned hotels experience a significant and lasting improvement in “departmental” profit margins. (Departmental profits are defined as revenues from rooms, food and beverage, and other operating departments, minus the variable costs incurred in running those departments. See Table 3 for a breakdown of hotel accounting statements under USALI.) We demonstrate that this improvement is due to a reduction in costs, notably labor costs in the rooms department. However, we also show that the savings achieved by PE investors in the departmental expenses of the subject hotels are offset by higher “undistributed” (overhead) costs, in particular those incurred for sales and marketing. On balance, we find that net cash flows to PE investors are indistinguishable from those earned by other investor types in the hotel industry.

Net operating cash flows notwithstanding, PE investors may still earn higher total returns on their hotel investments than do their competitors if they achieve superior capital appreciation by making savvy acquisition and disposition choices. We show that PE investors indeed earn significantly higher rates of capital appreciation over the holding period of their hotel investments than do other investor types. Our results suggest that this outperformance is driven by higher resale prices, rather than lower purchase prices. A comparison of the buyer types favored by PE versus other seller types when exiting their hotel investments shows that PE investors disproportionately trade with public investors (REITs and real estate operating companies), who—as we document— pay higher quality-controlled purchase prices. In sum, our findings suggest that PE investors outperform

other hotel investor types in identifying the buyers with the highest valuations, and this skill allows them to earn superior rates of capital appreciation on their hotel investments.

We then rule out two other possible explanations for the higher-than-average capital gains earned by PE investors between their hotel acquisitions and dispositions. First, capital appreciation in real estate may be driven by follow-up investments in renovations and structural improvements of the properties. To distinguish this mechanism from the transactions-based one described above, we separately analyze capital expenditures in the subject hotels under PE ownership compared to those in their characteristic-matched control hotels owned by other investor types. We do so by matching the hotel ownership data from RCA with asset-level data on construction and renovation projects from Dodge Data & Analytics, a leading data provider for the commercial real estate industry. We show that PE investors are no more likely to invest in capital expenditures on their hotel real estate assets than are other investor types. Second, maybe hotel valuations improve under PE ownership because of increases in guest satisfaction, which could lead to future increases in cash flows and profitability. However, by matching hotel ownership data from RCA with guest review scores from Tripadvisor, we show that guest experience ratings are unaffected by PE investments in the subject hotels.

Investment returns to equity also depend on the structure and cost of financing. PE investors commonly use significant amounts of external debt to finance their acquisitions (Gompers et al. (2016)) and they have been shown to time credit market conditions (Axelson et al. (2013)). To re-examine the capital structure decisions of PE investors versus other hotel investor types, we analyze the detailed information on mortgage financing deals included in the RCA transactions database. We show that the loan-to-value ratios and loan maturities of mortgages to PE borrowers largely resemble those of mortgages to non-PE borrowers. However, we show that PE investors borrow at cheaper interest rates than do non-PE investors, all else equal. Our results imply that, holding constant broad credit market conditions, PE investors thus enjoy superior access to cheaper debt financing than do their competitors.

Our work is part of a new literature that carefully analyzes how PE investors may create value. Gompers et al. (2016) survey PE investors to elicit detailed qualitative information about their valuation, financing, governance, and management practices. Biesinger et al. (2020) provide a comprehensive empirical analysis of several popular PE value creation strategies, including revenue growth, operational improvements, governance, financing, and cash management. While our results suggest that PE ownership is associated with a small positive effect on operational efficiency, we find no evidence of revenue growth or gains in bottom-line profitability. PE firms may create value for their clients mainly by acting as arbitrageurs in real assets and through their access to cheap financing.

2 Private Equity Investments in the Hotel Industry

2.1 *Hotel Transactions Data*

To identify hotel transactions involving private equity investors, we use data from Real Capital Analytics (RCA), the leading provider of commercial real estate transactions data. We start with all hotel transactions in the RCA database over the 2001–2019 period, including single transactions, portfolio transactions, and entity-level deals (i.e., acquisitions of hotel owner-operator companies).³ We exclude transactions of minority interests, partial leaseholds, and other non-standard conveyance types; taken together, these excluded records represent less than 10% of the transactions data.

The unit of observation in our database is a transaction of an individual hotel; each portfolio transaction or entity-level deal thus represents multiple observations. In total, our data set includes 26,877 individual hotel transactions for 17,094 different properties. Individual hotels may occur in the data set more than once if they are traded more than

³Our analyses consider the cash flows and capital gains associated with the ownership and operation of hotel real estate assets. We do not consider other components of the returns that private equity investors may earn on any investments in hotel owner-operator companies; such as the returns associated with the ownership of a hotel company's franchising business or any other lines of business that may form part of an entity-level acquisition.

once during the sample period. Table 1 presents a number of descriptive statistics on our data set. Panel A shows that transactions of single hotels represent the most frequent transaction type in our sample (70%), followed by portfolio transactions (21%), and entity-level deals (9%). In Panel B, we show the top-10 most frequently observed cities and hotel franchises in our data set. The statistics reported indicate that hotel transactions occur across a broad range of locations and comprise independent hotels as well as businesses associated with a diverse set of brand franchises.

[Insert Table 1 about here.]

To account for joint venture deals, each transaction in the RCA database is linked to up to four different buyers and sellers. The left column of Panel C shows the top-10 buyer types, using the RCA classification and terminology, based on the first-mentioned buyer for each transaction. It also shows the number of hotel purchases for each buyer type. The statistics reported show that owner-operators account for the majority of transactions (64%). In the RCA database, private equity (PE) investors are labelled “equity funds;” they account for 15% of the sample transactions. The center and right column of Panel C show the top-10 PE buyers and non-PE buyers, again based on the first buyer mentioned for each transaction. The statistics presented show that Blackstone is the most important PE buyer, representing 5% of the total number of transactions. The composition of non-PE buyers is more dispersed, with the top non-PE buyer (Apple REIT, which specializes in upscale hotels) accounting for only 1% of transactions.

In Panel D of Table 1, we show the distribution of transactions over the presence of a PE buyer and/or a PE seller in the transaction. Here we expand the definition of PE buyers and sellers to include all transactions where a PE investor was identified as one of the investors recorded for each transaction in the RCA data. By this metric, PE buyers (sellers) were involved in 16% (10%) of the transactions in our sample.

Table 2 presents descriptive statistics on the level of the transacted hotels (in Panel A) and the transactions (in Panel B). The statistics reported in Panel A indicate that a

transacted hotel was on average built in the mid-1980s, and has on average slightly more than 140 rooms. The results presented in Panel B show that the median transaction price is \$6.15m, while the mean is \$19.98m, reflecting the long right tail in property values. We have information for transaction cap rates—measured as hotel EBITDA divided by the transaction price—for a subset of deals. Based on those deals, the mean and median cap rate in our sample are 8.6%.

[Insert Table 2 about here.]

2.2 *Hotel Acquisitions Volumes By Investor Types*

In our empirical analysis, we classify purchases (sales) as being “PE” or “non-PE” based on whether any of the buyers (sellers) are labeled as PE (cf. Panel D of Table 1). Based on this definition, Figure 1 shows the purchase dollar volume and number of acquired properties for PE and non-PE purchases separately. Both PE and Non-PE investment activity is procyclical, increasing significantly in the 2001–2007 period before collapsing during the great recession of 2008–2009 and recovering during the subsequent expansion. Non-PE acquisition volumes typically exceed PE acquisition volumes except in 2007 (2008) where PE investment activity is nearly on par with (exceeds) Non-PE activity. Unlike Non-PE acquisition volumes, PE hotel acquisition volumes remain well below their pre-crisis peak levels by the end of the sample period.

[Insert Figure 1 about here.]

3 Private Equity Investors and Hotel Operating Performance

3.1 *Hotel Operating Performance Data*

We obtain detailed accounting data on hotel operations and profitability from CBRE Hotels. CBRE collects data annually, based on a voluntary survey inviting participants to submit

performance information in return for access to industry benchmarking reports. The survey covers about 7,000 hotels, which represent 15% of the hotels in the U.S. The CBRE survey is focused on institutional-grade, investable hotel assets; that is, it predominantly covers hotels in the mid-market and higher chain scales, that are chain-affiliated (branded), and that operate under professional ownership and management companies.

The structure of the CBRE survey follows the industry-standard Uniform System of Accounts for the Lodging Industry (USALI), which facilitates performance comparisons across hotels. Table 3 presents the USALI model of the hotel profit and loss statement structure adopted in the CBRE survey. Based on this accounting model, Figure 2 presents the composition of hotel “departmental” revenues (Panel A), departmental and “undistributed” (i.e., operating overhead) expenses (Panel B), and non-operating expenses as well as fixed charges (Panel C) for our sample hotels. Further, the CBRE survey includes hundreds of variables, covering general information about the hotel (e.g., location, price segment, management and ownership), top-line performance indicators (occupancy, average daily rate (ADR), and revenue per available room (RevPAR, which is the product of occupancy and ADR), aggregate measures of hotel profitability, and granular data on revenues and costs (e.g., cost of goods sold, labor) across all hotel departments (e.g., rooms, food and beverage).

[Insert Figure 2 and Table 3 about here.]

We obtain data on two sub-samples of hotels from CBRE. First, we gather information on all hotels involved in a transaction between 2003 and 2017 with a PE buyer or seller in the RCA database for which CBRE has at least one year of accounting data in the two years before the PE-involved transaction and at least one year of accounting data in the two years after the transaction (the “subject group”). This sample contains almost 17,000 observations for 1,274 distinct hotels (representing 1,839 transactions).⁴ Second, we construct a set of comparable hotels by matching transacted hotels in the subject group to peer businesses out-

⁴Panel D of Table 1 showed 6,798 transactions involving a PE investor in the RCA data. We thus have operating performance data relating to 27% of all “PE transactions”.

side that group based on geography, property type, chain scale, and room type (the “control group”). This sample contains data for 1,337 hotels.⁵ Figure 3 shows the yearly numbers of transactions involving a PE buyer or seller for which we have hotel performance data from CBRE, alongside the yearly numbers of CBRE performance observations for the hotels in the subject and control groups. Our strategy of using tightly defined control groups based on *ex ante* observable attributes serves to address concerns around selection bias and is similar to that followed by Biesinger et al. (2020), Bharath et al. (2014), and Davis et al. (2014) .

[Insert Figure 3 about here.]

Table 4 presents key performance measures across the sets of subject and control hotels in our sample. This performance comparison is unconditional and includes all observations of subject hotels and all observations of control hotels, regardless of the timing relative to any PE investments. The statistics reported in Panel A show that our subject and control hotels achieve similar top-line performance measures; notably, (log) ADR, occupancy, and (log) RevPAR. Panel B (C) of Table 4 presents expense (profit) ratios across the subject and control hotels. The statistics reported indicate that the hotels in the two sub-samples operate at comparable expense and profit levels. The results reported in Table 4 suggest no economically significant differences across the subject and control groups based on these key observable performance metrics.

[Insert Table 4 about here.]

3.2 Time-Series Patterns in Hotel Operating Performance

We take a first step at gauging the impact of PE investors on the operating performance of the hotels they acquire through a graphical comparison of the annual time-series of raw performance measures across the subject and control hotels in event time. Event time

⁵If the same subject hotel is involved in a PE transaction more than once, it can exceptionally be matched to different control hotels, depending on the availability of data.

for both subject and control hotels is measured relative to the year in which a PE investor acquired a given subject hotel. Figures 4, 5, and 6 present the time-series of top-line performance measures, expense ratios, and profit ratios, respectively, across the subject and characteristic-matched control hotels for the five years leading up to the year in which PE acquired a given subject hotel—denoted year zero—and for the subsequent five years.

[Insert Figures 4, 5, and 6 about here.]

Panels A, B, and C of Figure 4 show the annual mean ADR, occupancy, and RevPAR levels, respectively, across subject and control hotels in event time. The time-series patterns depicted indicate parallel trends in the evolution of those top-line performance measures across the subject and control hotels in the period leading up to the acquisitions of the subject hotels by PE and in the five years thereafter. The overlap in the 90% confidence intervals included in the time-series plots indicates that the levels of ADR, occupancy, and RevPAR around the year of a PE acquisition are statistically indistinguishable across the subject and control hotels in most of the years included in these comparisons.

Panels A through D of Figure 5 present yearly means of the ratios of departmental expenses, undistributed expenses, non-operating expenses, and fixed charges to total revenues, respectively. The evolution of departmental expense ratios suggests that subject hotels experience a significant and persistent decline in departmental expenses starting with the year of the PE acquisition (Panel A). By contrast, there is no significant difference in undistributed expense ratios across subject and control hotels around PE investments (Panel B). Non-operating expense ratios (fixed charge ratios) for subject hotels are volatile but comparable to those of control hotels in the majority of the years included in this analysis (Panels C and D, respectively).

Figure 6 shows the time-series of mean departmental profit (Panel A), gross operating profit (Panel B), EBITDA (Panel C), and net income (Panel D), each scaled by total revenue, across subject and control hotels in event time. Reflecting the patterns observed in the expense ratios depicted in Figure 5, where the only significant improvement in operating

efficiency under PE ownership occurs on the level of departmental expenses, subject hotels experience superior departmental profit ratios following the acquisition by PE investors (Panel A). By contrast, the other profit measures for the subject hotels remain comparable to those of the control hotels around the years of PE investments (Panels B through D).

3.3 Do Hotels Perform Better Under Private Equity Ownership?

We formalize the analysis of hotel performance around PE investments using a difference-in-differences strategy across subject and characteristic-matched control hotels around the time of PE investments in the subject hotels. We estimate regressions of the following form:

$$y_{i,t} = \alpha + \beta PE_i \times PostPE_{i,t} + \gamma PostPE_{i,t} + \delta_i + \theta_{l,t} + \epsilon_{i,t} \quad (1)$$

where $y_{i,t}$ is a performance outcome for hotel i in year t . α is a constant term. PE_i is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. $PostPE_{i,t}$ equals one starting with the year in which PE acquires a subject hotel and zero before then. For control hotels, $PostPE_{i,t}$ equals one starting with the year in which PE first acquires their matched subject hotels and zero before then. The main coefficient of interest is β , which is identified from the interaction between PE_i and $PostPE_{i,t}$. δ_i are hotel fixed effects. These fixed effects subsume the main effect of the PE_i indicator. $\theta_{l,t}$ are region $l \times$ year t fixed effects. $\epsilon_{i,t}$ denotes the residuals, clustered by hotel brand. We estimate Eq. (1) for the five years leading up to and the five years following the year when PE first invests in a given subject hotel. Our econometric specification is similar to that employed in Biesinger et al. (2020).

Table 5 presents the results from estimating Eq. (1) for the top-line performance metrics across our subject and control hotels. The estimates reported in column (1) show that ADR is not significantly different across subject and control hotels after PE investments in the subject hotels. The results tabulated in columns (2) and (3) show similarly insignificant

effects of PE ownership on occupancy and RevPAR, respectively. In sum, the regression results reported confirm the conclusions from the graphical analysis in Figure 4 that PE ownership has no significant impact on hotel top-line performance.⁶

[Insert Table 5 about here.]

In Table 6 we report the regression results from estimating the difference-in-differences model described in Eq. (1) for the four key hotel expense ratios included in the CBRE survey. The estimation results again confirm the inference from the discussion in Section 3.2, that the only identifiable impact of PE owners on hotel operating efficiency occurs on the level of departmental expenses (see column (1)). The unconditional mean of the departmental expense ratio in the subject hotels is 0.30 with a standard deviation of 0.09 (cf. Table 4, Panel B). The coefficient estimate of -0.009 for the interaction term between PE_i and $PostPE_{i,t}$ implies that departmental expenses decline by 3% relative to that unconditional mean. This seemingly small improvement in operating efficiency may however have a significant impact on the bottom line, as departmental expenses represent a sizeable share of total hotel expenses (cf. Figure 2). By contrast, our results suggest that PE ownership is associated with higher undistributed expenses and non-operating expenses, even if the effects are not significant at conventional statistical thresholds.

[Insert Table 6 about here.]

Table 7 presents the final set of regression results on the impact of PE ownership on hotel operating performance. These estimation results focus on hotel profit ratios. Consistent with our earlier finding that PE ownership is associated with a significant decline in departmental expense ratios, the estimates reported in column (1) of Table 7 show that subject hotels experience superior departmental profit ratios under PE ownership compared

⁶Since hotel revenues are dominated by room revenues (see Figure 2A), a lack of gains in ADR or occupancy for subject hotels means those businesses are unlikely to experience higher revenue levels or stronger revenue growth under PE ownership. We verify those conjectures in a formal regression setting and, consistent with our expectations, find no significant effects of PE ownership. These results are available upon request.

to their characteristic-matched control hotels. The statistics in Table 4, Panel C, indicate that the mean departmental profit ratio for subject hotels is 0.70, with a standard deviation of 0.09. Therefore, while the impact of PE ownership on the departmental profit ratios of the subject hotels is statistically significant, it is small in economic terms, representing a relative improvement of 1.3% over the unconditional mean departmental profit ratio. The estimates reported in columns (2) through (4) of Table 7 show that gross operating profit, EBITDA, and net income are statistically indistinguishable between PE-owned subject and control hotels. In other words, the relative performance advantage of PE subject hotels over their characteristic-matched peers stemming from superior departmental profits does not carry through to any of the subsequent profit measures.⁷

[Insert Table 7 about here.]

3.4 *The Channels Through Which Private Equity Influences Performance*

We dig deeper into the two key findings from the preceding analysis; namely, PE-owned subject hotels experience a significant improvement in departmental expense ratios, leading to higher departmental profits, and yet, the performance advantage subject hotels enjoy from higher departmental profits does not help their bottom line. Next, we identify the mechanisms driving these performance patterns.

First, we explore the drivers behind the reduction in departmental expenses, which leads to the improvement in departmental profits. Labor expenses are the largest component of hotel departmental expenses, representing nearly 60% of the total. PE investors may target this significant cost item to reduce departmental expenses. To explore this conjecture, we replicate the regression model specified in Eq. (1) for the ratio of departmental labor expenses to total revenue, as well as for the corresponding labor expense ratios in each of

⁷The regression analyses presented in Tables 5 through 7 compare the average performance outcomes across subject and control hotels across the five years leading up to the acquisitions of the subject hotels by PE investors with the corresponding average performance outcomes in the five years following those acquisitions. We examine year-by-year effects of PE ownership on performance outcomes across subject and control effects separately. Those results are reported in Appendix A.

the individual operating departments of the sample hotels. Those departments encompass rooms, food and beverage (F&B), and other (e.g., conference center, spa facility).

Labor expenses may decline due to salary cuts for existing employees or due to a reduction in the number of staff employed. While we are unable to observe employee-level payroll data, we are able to obtain information on the number of staff employed by the sample hotels. We obtain data on the annual number of employees in the sample hotels from the Your Economy Time Series (YTS) database.⁸

Table 8 presents the regression results from estimating Eq. (1) for departmental labor expenses ratios and the (log) number of employees in the sample hotels. The estimates reported in column (1) show that total departmental labor expenses decline significantly for hotels under PE ownership. The coefficient estimates in column (2) show that this expense reduction is primarily driven by a decline in labor expenses in the rooms department. The results presented in columns (3) and (4) show that there are limited reductions in the labor expenses in the F&B and other operating departments. The estimates reported in column (5) suggest that the decline in departmental labor expenses is at least partly driven by a reduction in the number of staff employed in hotels owned by PE investors, although the coefficient estimate on the interaction term of interest is statistically insignificant.

[Insert Table 8 about here.]

The results presented above suggest that hotels owned by PE investors outperform their peers in terms of departmental expenses due to lower labor expenses. This cost advantage results in superior departmental profits for hotels with PE funding. However, as discussed in Section 3.3, our results suggest that the gross operating profit of PE-owned hotels is no different from that of their peers. To identify the operating overhead expense items driving this finding, we replicate the regression model from Eq. (1) for each of the undistributed expense ratios reported in the CBRE benchmarking survey.

⁸YTS is an annual establishment-level census that reports, for each business registered in the U.S., a number of characteristics, such as business name, industry, address, and the number of staff employed at year-end. We merge employment data from YTS with the performance data on our sample hotels by business location.

Table 9 presents the estimation results. The estimates reported under columns (1) and (2) show that A&G and IT expenses, respectively, are statistically indistinguishable between hotels back by PE funding and those owned by other investor types. In contrast, the results tabulated in column (3) show that PE ownership is associated with significantly higher sales expenses.⁹ The estimates in column (4) show a small reduction in maintenance expenses for PE-owned hotels. However, sales expenses represent a significantly larger share of total undistributed expenses than do maintenance costs (see Panel B of Figure 2). Therefore, the small savings realized by PE-backed hotels under the latter expense item do little to counteract their increased spending on sales expenses. In sum, the regression results presented here suggest that the superior performance of PE-backed hotels in terms of departmental profits, which—as we document—is driven by lower labor expenses, is offset by increased spending on sales. These higher sales expenses explain why the superior departmental profits in the subject hotels fail to improve their bottom line relative to the control hotels.¹⁰

[Insert Table 9 about here.]

4 Capital Gains to Private Equity Investors

Our analyses presented in the preceding sections show that PE investors achieve limited improvements in the operating efficiency for the hotels they acquire relative to a set of characteristic-matched control hotels and that they do not achieve superior net cash flows from their hotel properties. Thus, for PE investors to outperform other investor types in the hotel sector, they must realize higher capital gains—either by acquiring properties at

⁹We note that these higher sales expenses coincide with a temporary improvement in ADR (see Panel A of Figure 4 and Panel A of Figure A.1). It seems intuitive for investors to target ADR when seeking to improve operating performance as hotels have high variable costs, and thus higher occupancy may not boost performance.

¹⁰Hotel investors commonly hire third-party management companies to operate their hotels. Given the resulting separation of ownership and control, one might ask how PE investors influence the operations of their hotels in the first place. Interviews with PE asset management professionals in the hotel industry suggest that replacing the incumbent management company with a different, better one is a popular value-add strategy for hotel investors. Consistent with this narrative, we show in Appendix B that PE investors are more likely than are other hotel investor types to replace the management companies in the hotels they acquire.

steeper discounts than other investor types, or by reselling at higher prices when they exit their hotel investments. We use our granular data on hotel transactions to explore the empirical evidence for those conjectures.

4.1 Analysis of Repeat-Sales Transactions

To analyze the capital gains earned by PE investors in the hotel industry, we create a sample of repeat-sales by focusing on those hotels for which we observe both, acquisitions and the subsequent dispositions. We assess the relative magnitude of the total capital gains realized by PE versus other hotel investor types by estimating the following regression specification:

$$\Delta p_{i,t} = \alpha + \beta PE_{Seller_{i,t}} + \gamma Controls_{i,t} + \delta_{i,t} + \theta_{l,t} + \epsilon_{i,t} \quad (2)$$

where $\Delta p_{i,t}$ is the difference between the log price per room in the acquisition of hotel i and the log price per room in the subsequent disposition of hotel i sold in year t . $PE_{Seller_{i,t}}$ is an indicator that takes the value of one if the seller in a given transaction is a PE investor, and zero otherwise. Further, we include the following covariates in Eq. (2), summarized in the term *Controls*: hotel size, measured as the log number of rooms, an indicator for the location type of a hotel that takes the value of one for a CBD location, and zero otherwise, and an indicator for the sub-type of a hotel that takes the value of one for full-service hotels, and zero for limited-service hotels. $\delta_{i,t}$ are fixed effects for the length of the holding period of property i sold at time t , measured in years. $\theta_{l,t}$ are region $l \times$ sale year t fixed effects. $\epsilon_{i,t}$ denotes the residuals, clustered by hotel brand. We exclude entity-level deals from this analysis to remove any undue influence of large portfolio transactions.

Column (1) of Table 10 presents the results. The coefficient estimates reported show that PE sellers achieve significantly higher capital gains—in statistical and economic terms—on their hotel investments than do other investor types. In column (2), we add an indicator variable that takes the value of one if the new *buyer* in a given transaction is a PE investor.

The coefficient on this variable is close to zero, suggesting that PE investors do not buy at lower prices, but rather resell at higher prices, than do other types of hotel investors.

[Insert Table 10 about here.]

4.2 *The Importance of Counterparties*

How are PE investors able to achieve the greater capital gains on their hotel properties despite the lack of increases in profitability? One intuitive possibility is that PE investors are more skilled than other investor types at targeting buyers with particularly high valuations when they exit their hotel investments. To assess the evidence for this hypothesis, we first compare the composition of counterparties for transactions by PE sellers with that for transactions by other seller types. Figure 7 depicts overlaid histograms of the frequencies with which PE sellers trade with different buyer types as compared to the buyer types favored by sellers from other investor categories. The figure shows that, compared to other seller types, PE investors are disproportionately more likely to sell to institutional buyers (notably, investment managers and insurance companies) and to public buyers (hotel REITs). Specifically, while non-PE investors predominantly sell to private buyers (77% compared to 54% for PE sellers), PE investors sell significantly more frequently to institutional buyers (30% versus 13% for non-PE sellers) and to public buyers (14% compared to 6% for non-PE sellers).

[Insert Figure 7 about here.]

Can the difference in the composition of counterparties for PE sellers explain their superior capital gains? In column (3) of Table 10, we add buyer type dummies for the main investor groups: institutional, private, public, and user/other buyers. The omitted category is that of unknown buyers. The coefficient estimates reported show that public buyers in particular are associated with higher transaction prices. Given the disproportionately high ratio of resales to this investor category for PE sellers, the magnitude of the capital gains difference between PE-sellers and non-PE sellers declines and loses statistical significance

once we control for this buyer type effect. In sum, our findings suggest that PE investors realize superior capital gains on their hotel investments at least in part because they are able to resell at higher prices to deep-pocketed buyers.

4.3 *Alternative Explanations*

We find that PE investors realize significantly higher capital gains on their hotel investments. Given that we do not see improvements in the bottom-line performance, we have argued that the higher capital gains are related to an ability to resell at higher (quality-controlled) prices. However, maybe PE investors enhance the value of the hotels they acquire in a way that does not immediately translate to higher operating profits. In this subsection, we explore the empirical evidence for two such mechanisms. First, we analyze the possibility that PE investors structurally improve the quality of their hotels through renovations or expansions. Second, we assess whether PE ownership influences guest satisfaction, which could result in greater client loyalty, thus stabilizing operations and leading to higher profits in the future.

4.3.1 Capital Expenditures

Follow-up investments to renovate, expand, or otherwise improve a property represent a popular value-add strategy in real estate. We assess the empirical evidence for the likelihood of PE investors, relative to other investor types, to complete such follow-up investments in their hotel properties. To do so, we obtain property-level data on hotel capital expenditures from Dodge Data & Analytics.¹¹ We then estimate the likelihood that a subject hotel undergoes a capital expenditure project in a given year under PE ownership

¹¹Dodge Data & Analytics is a project-level database on commercial real estate construction starts across various property types, including hotels. Amongst other attributes, each project record contains information about the property; including its name, property type, and address, and about the construction project; including, the planned start and completion dates, the type of project (addition, alteration, conversion, or new construction), and the value of the project. We match the construction data from Dodge Data & Analytics with the ownership data on our sample hotels by business location.

using the following linear probability model:

$$CAPEX_{i,t} = \alpha + \beta PE_i \times PostPE_{i,t} + \gamma PostPE_{i,t} + \delta_i + \epsilon_{i,t} \quad (3)$$

where $CAPEX_{i,t}$ is an indicator that takes the value of one if hotel i undergoes a capital expenditure project in year t , and zero otherwise. The remainder of the variables and notation are as in Eq. (1). We estimate Eq. (3) separately for each type of capital expenditure project included in the Dodge Data & Analytics; that is, we replicate the estimation of Eq. (3) separately for additions, alterations, conversions, and new construction projects.¹²

Table 11 presents the regression results. The coefficient estimates reported in columns (1) through (4) show that the subject hotels owned by PE investors are no more likely to undergo any capital expenditure projects, regardless of the exact types of projects, than are the characteristic-matched control hotels owned by other investor types.

[Insert Table 11 about here.]

Our results suggest that the pay-back periods for undertaking significant construction projects may be too long for the typically shorter holding periods of PE investors in the hotel industry. In combination with our earlier findings that subject hotels owned by PE investors experience substantial reductions in labor costs and personnel cuts (cf. Table 8), as well as increases in marketing but reductions in maintenance expenses (cf. Table 9), our results here imply that PE investors in the hotel industry prefer to implement value-add strategies potentially yielding a quick boost to cash flows, rather than engaging in projects to improve the quality of their holdings for the long run.¹³

¹²Due to the relative infrequency of hotel construction projects, the estimation of Eq. (3) fails to converge when including the saturated set of fixed effects from Eq. (1). For robustness, we re-estimate Eq. (3) in logit form (without fixed effects) and also using simple OLS models with different combinations of fixed effects. Our results remain unchanged across these different estimation strategies. Details are available upon request.

¹³Interviews with PE asset management professionals in the hotel industry confirm that typical holding periods for PE investors are between five and seven years in the hotel industry.

4.3.2 Guest Satisfaction

Although our results show that PE investors have limited impact on hotel operating cash flows, a more hands-on management style by motivated owners involving closer monitoring of employee effort and performance may result in higher guest satisfaction. A more satisfied and loyal client base could in turn lead to higher and more stable expected profits going forward, and thus positively affect the market value of a hotel.

To assess the empirical association between PE ownership and hotel guest satisfaction, we merge our hotel performance data from the CBRE benchmarking study with information on guest ratings from Tripadvisor.¹⁴ On this platform, hotel guests can leave scores on a scale from one through five to rate several aspects of their stay at a given hotel; namely, overall satisfaction, service, cleanliness, and sleep quality. We estimate the marginal effects of PE ownership on the ratings for the subject hotels relative to those for the control hotels using the following econometric specification:

$$Rating_{i,t} = \alpha + \beta PE_i \times PostPE_{i,t} + \gamma PostPE_{i,t} + \delta_i + \theta_{l,t} + \epsilon_{i,t} \quad (4)$$

where $Rating_{i,t}$ denotes the mean score in a given rating category received by hotel i in year t . The remaining variables and notation follow those in Eq. (1).

We summarize the results from estimating the regression specified in Eq. (4) for our subject and control hotels in Table 12. The coefficient estimates tabulated in columns (1) through (4) show that the mean guest review scores received by the subject hotels under PE ownership are statistically indistinguishable from those received by their characteristic-matched control hotels owned by other investor types.¹⁵

¹⁴ Tripadvisor collects guest experience ratings from individual stays for thousands of hotels in the U.S. We collapse the scores recorded in each review for a given hotel and a given date of stay to the hotel-year level by taking the simple means of the scores provided in each rating category. We match those scores to our hotel performance and ownership data by hotel name and zip code.

¹⁵ Our findings imply that the cost-cutting measures implemented by PE investors in their hotels do not compromise the quality of guest experiences. By contrast, staff cuts under PE ownership have been shown to result in declines in service quality in nursing homes (Gupta et al. (2020)).

[Insert Table 12 about here.]

5 Hotel Financing Decisions by Private Equity Investors

PE investors' returns on equity also depend on their financial leverage and the cost of external financing. The RCA hotel transactions records include information on the mortgages used to finance hotel acquisitions, including the mortgage interest rate, the term of the mortgage contract, the debt service coverage ratio (DSCR), and the loan-to-value (LTV) ratio at underwriting. We test whether PE investors enjoy more favorable financing conditions than other investor types by estimating the following regression model for the hotel transactions in our sample:

$$y_{i,t} = \alpha + \beta PE\text{Borrower}_{i,t} + \gamma \ln\text{PriceRoom}_{i,t} + \delta_i + \phi_m + \theta_{l,t} + \epsilon_{i,t} \quad (5)$$

where $y_{i,t}$ denotes a given mortgage characteristic (interest rate, term, DSCR, or LTV). $PE\text{Borrower}_{i,t}$ is an indicator variable that takes the value of one if hotel i at time t is financed by a PE investor, and zero otherwise. $\ln\text{PriceRoom}_{i,t}$ is the log price per room in the transaction of hotel i at time t . ϕ_m are lender fixed effects. The remaining variables and notation are as before.

We summarize the regression results in Table 13. The coefficient estimates in column (1) show that PE borrowers achieve lower interest rates on the mortgage contracts used to finance their hotel acquisitions than do other investor types. The estimates reported in column (2) show that debt maturities are similar across mortgage contracts taken out by PE and non-PE borrowers. The lower interest rates negotiated by PE borrowers are reflected in higher debt service coverage ratios at underwriting (see column (3)). The coefficient estimates reported in the final column (4) show that LTVs are similar across mortgages to PE and non-PE borrowers.

[Insert Table 13 about here.]

In sum, we find some evidence that PE investors are able to access cheaper debt capital to finance their hotel investments than do other investor types, which may further support the returns PE investors achieve on their equity invested.

6 Conclusion

We dissect possible mechanisms through which the PE model may create value by examining in detail the industry's investments in the U.S. hotel industry. For our analysis, we create a novel data set spanning the past two decades by merging asset-level transactions, ownership, and financing information with annual hotel operating performance data. Empirically, we combine matching methods with a difference-in-differences approach to assess the relative performance of PE-owned hotels versus that of characteristic-matched control hotels backed by other investor types. In summary, we show that: (i) PE investors do not seem to identify underperforming acquisition targets or to generate superior hotel revenue growth post-acquisition; (ii) PE investors achieve some operating efficiency gains by cutting labor costs, while nonetheless maintaining service quality, as reflected in guest experience ratings; (iii) yet, due to greater relative expenditures on sales and marketing, net cash flows to PE investors are no higher than those to other hotel investor types; (iv) PE investors are equally as likely as are other types of hotel owners to invest in capital expenditures; (v) relative to other types of hotel investors, PE investors benefit from better access to cheap debt capital; and (vi) PE investors most distinguish themselves from other hotel investor types on their capital appreciation rates, notably by exiting through transactions with counterparties willing to pay relatively high prices.

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Figure 1. Hotel Acquisition Volumes by Investor Type

This figure depicts aggregate annual U.S. hotel acquisition volumes (in US\$ billion) by PE versus non-PE investors over the 2001–2019 period, alongside the annual numbers of hotel properties acquired by each investor type. The hotel transactions data used to produce this figure are from RCA.

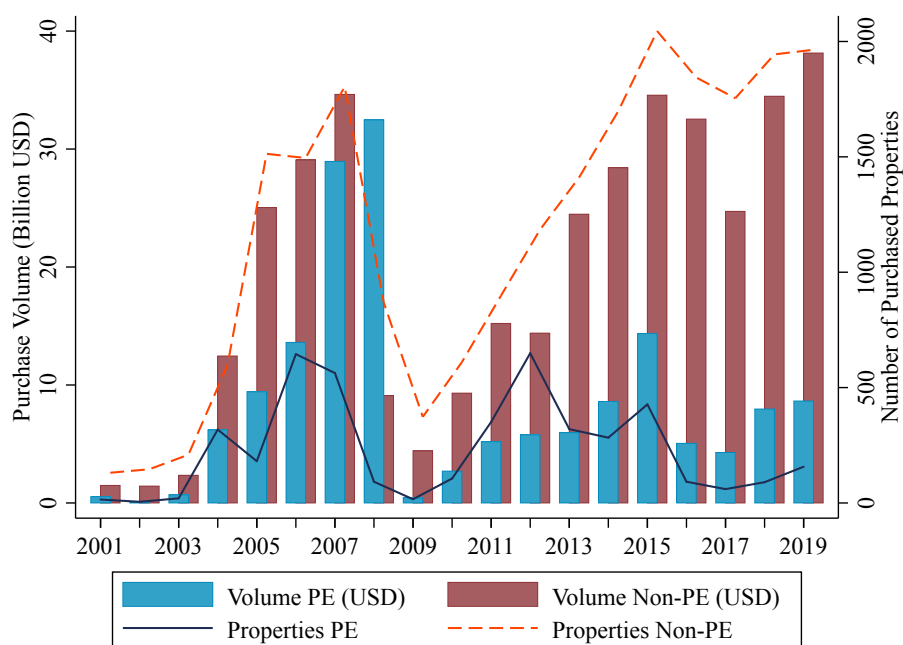
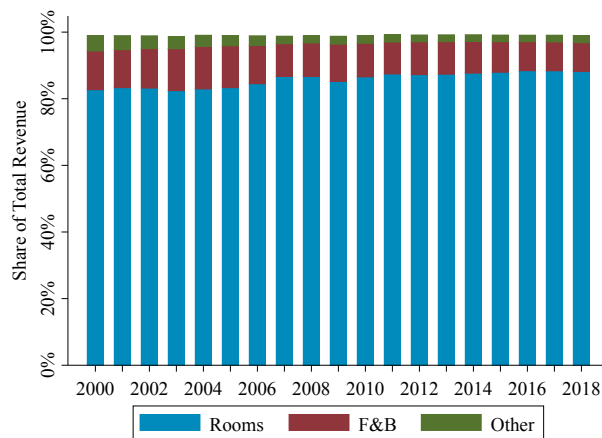
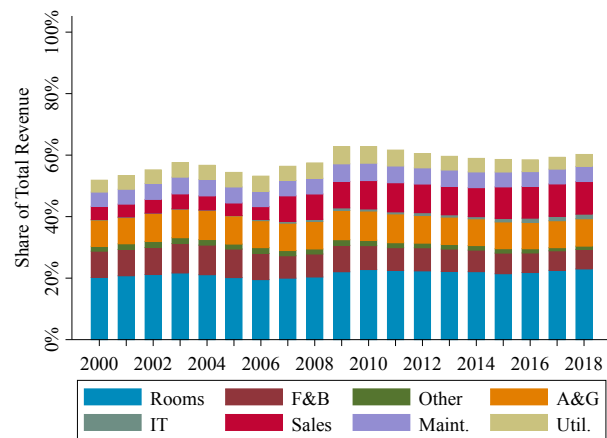


Figure 2. Breakdown of Hotel Revenues and Expenses

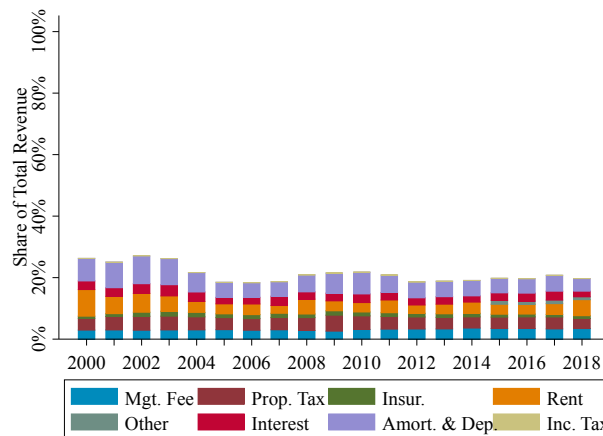
This figure depicts the annual decomposition of hotel revenues and expenses over the 2000–2018 period in the categories of departmental revenues (Panel A), departmental and undistributed expenses (Panel B), and non-operating expenses and fixed charges (Panel C). Departmental revenues include revenues from the rooms department, the food and beverage (F&B) department, and other operating departments (such as a conference center or a spa facility). Departmental expenses correspond to those same operating departments. Undistributed expenses include expenses for administration and general (A&G), information technology (IT), sales and marketing, maintenance, and utilities. Non-operating expenses include expenses for management fees (comprising a base fee and a performance fee), property taxes, property insurance, rent expenses, and other non-operating expenses (e.g. ground rent). Fixed charges include interest expenses, amortization and depreciation, and income taxes. Each of the annual revenue and expense items shown in the figure are scaled by hotel total revenues in the same year. The hotel performance data used to produce this figure are from CBRE.



(A) Departmental Revenues



(B) Departmental and Undistributed Expenses



(C) Non-Operating Expenses and Fixed Charges

Figure 3. Numbers of Sample Hotels in the Subject and Control Groups

This figure depicts the annual numbers of sample hotels in the subject and control groups, alongside the annual numbers of subject hotels acquired or disposed of by PE investors, over the 2000–2018 period. Subject hotels are defined as those involved in at least one transaction with a PE buyer or seller over the 2003–2017 period, as recorded in the RCA database, and for which CBRE have at least one year of accounting data in the two years prior to the transactions with PE involvement and at least one year of accounting data in the two years following those transactions. Control hotels are defined as those that were not involved in any transactions with PE buyers or sellers over the 2003–2007 period, but that share key observable characteristics with the subject hotels in terms of location, property type, chain scale, and number of rooms, and that have accounting data available for the same years as do the subject hotels. The hotel performance and transactions data used to produce the hotel counts depicted in this figure are from CBRE and RCA, respectively.

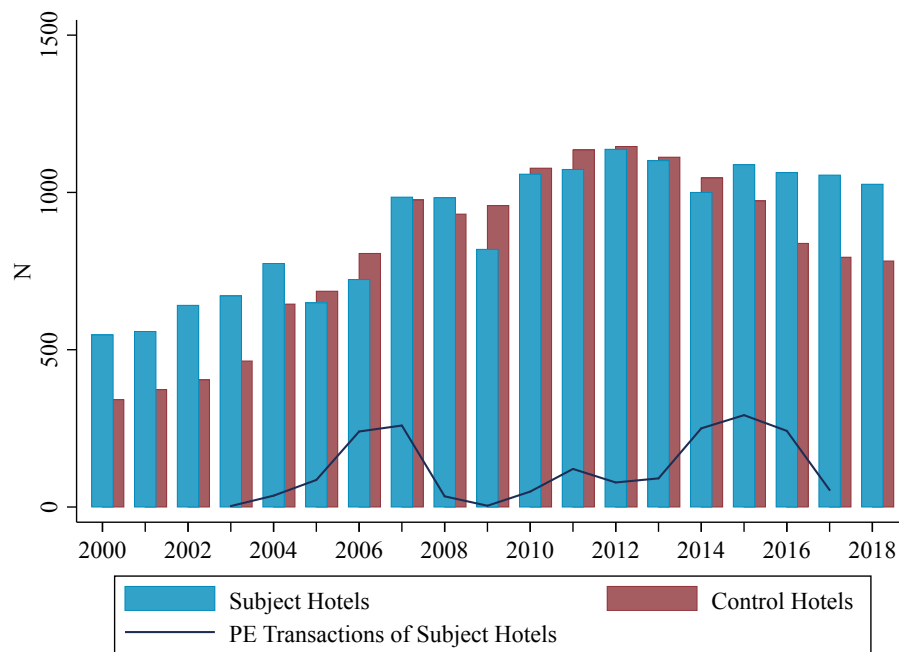
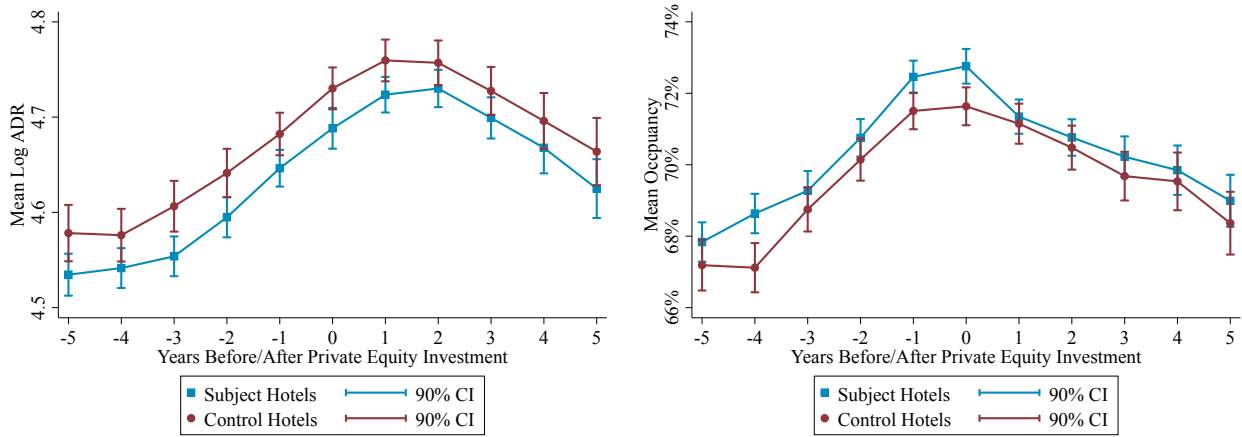


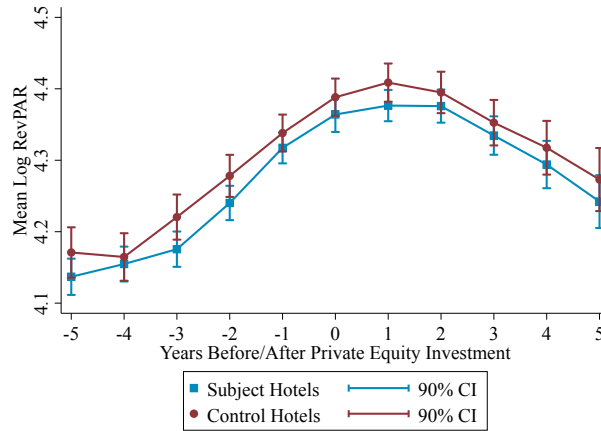
Figure 4. Top-Line Performance Around Private Equity Investment

This figure depicts the annual mean top-line performance measures for the subject hotels and their characteristic-matched control hotels around the year of PE investments in the subject hotels. Panel (A) shows the natural logarithm of the annual average daily rate (ADR). Panel (B) shows the annual average occupancy rate (in percent). Panel (C) shows the natural logarithm of the annual average revenue per available room (RevPAR, computed as $\text{ADR} \times \text{occupancy}$). The annual time-series of each of these top-line performance measures are shown in event time, where year 0 represents the year in which a given subject hotel received PE funding. The time-series of the performance data for the characteristic-matched control hotels assigned to each of the subject hotels are measured on the same timeline, reaching from five years prior to the PE investment in a given subject hotel to five years following that investment. The hotel performance data used to produce this figure are from CBRE.



(A) Average Daily Rate

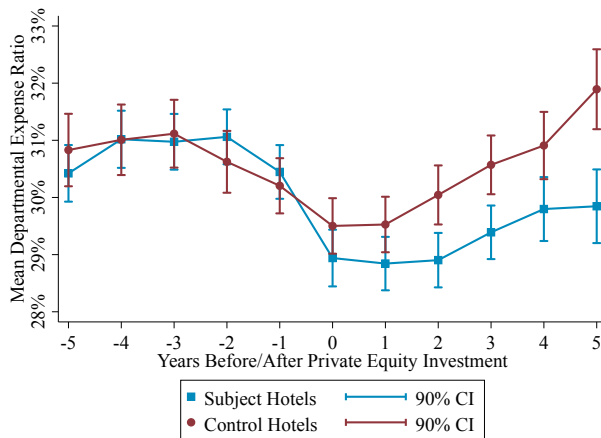
(B) Occupancy



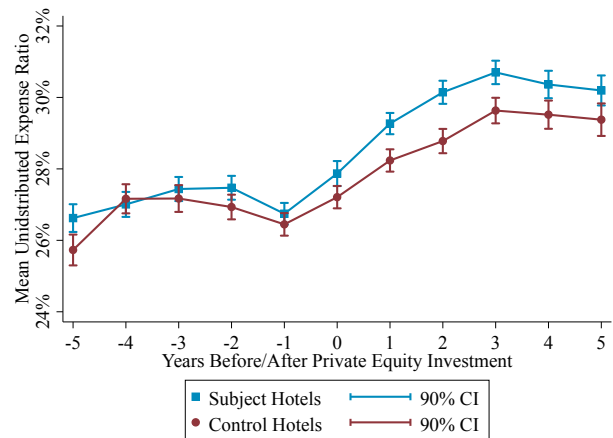
(C) RevPAR

Figure 5. Expense Ratios Around Private Equity Investment

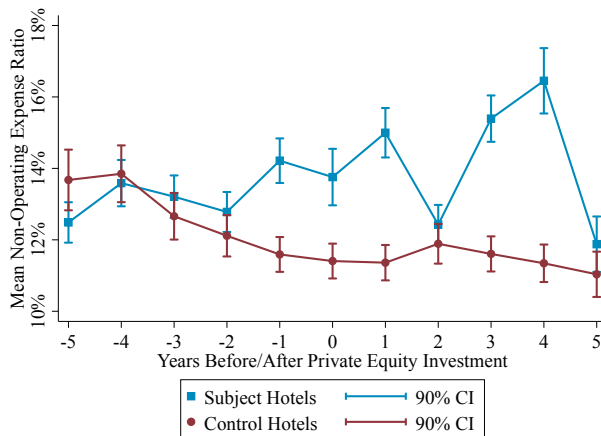
This figure depicts the annual mean expense ratios for the subject hotels and their characteristic-matched control hotels around the year of PE investments in the subject hotels. Panel (A) shows the annual mean ratios of total departmental expenses to hotel total revenues. Panel (B) shows the annual mean ratios of total undistributed expenses to hotel total revenues. Panel (C) shows the annual mean ratios of total non-operating expenses to hotel total revenues. Panel (D) shows the annual mean ratios of total fixed charges to hotel total revenues. The annual time-series of each of these expense ratios are shown in event time, where year 0 represents the year in which a given subject hotel received PE funding. The time-series of the expense ratios for the characteristic-matched control hotels assigned to each of the subject hotels are measured on the same timeline, reaching from five years prior to the PE investment in a given subject hotel to five years following that investment. The hotel performance data used to produce this figure are from CBRE.



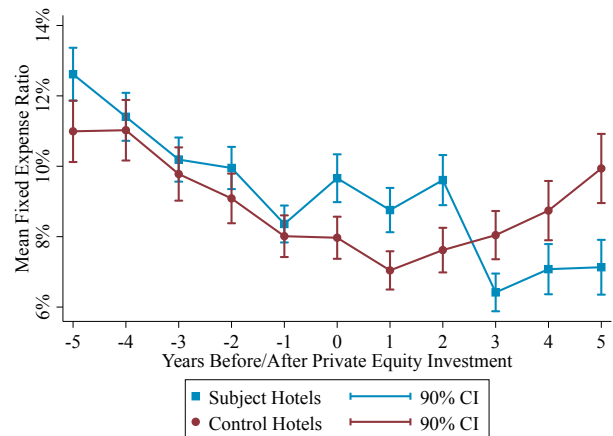
(A) Departmental Expenses



(B) Undistributed Expenses



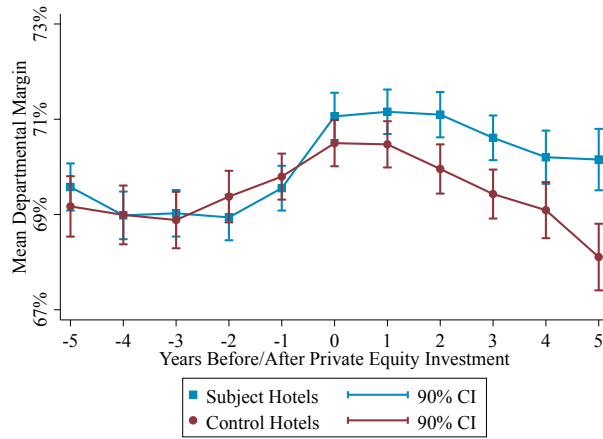
(C) Non-Operating Expenses



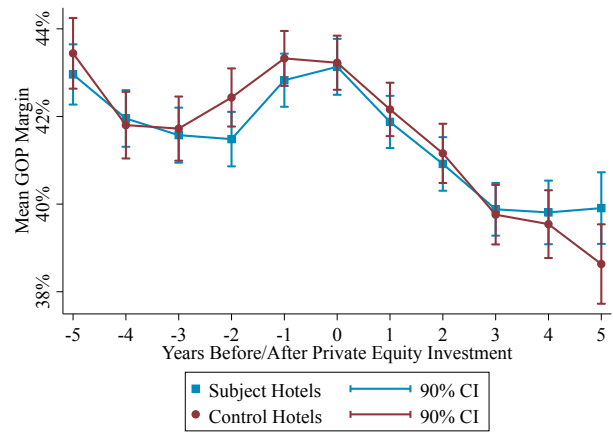
(D) Fixed Charges

Figure 6. Profit Measures Around Private Equity Investment

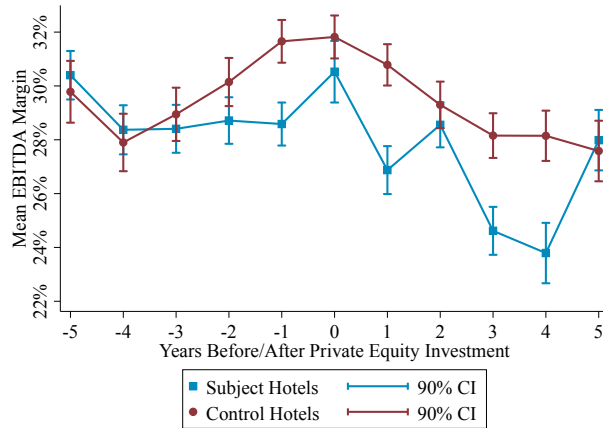
This figure depicts the annual mean profit ratios for the subject hotels and their characteristic-matched control hotels around the year of PE investments in the subject hotels. Panel (A) shows the annual mean ratios of total departmental profits to hotel total revenues. Panel (B) shows the annual mean ratios of total gross operating profits to hotel total revenues. Panel (C) shows the annual mean ratios of total EBITDA to hotel total revenues. Panel (D) shows the annual mean ratios of total net income to hotel total revenues. The annual time-series of each of these profit ratios are shown in event time, where year 0 represents the year in which a given subject hotel received PE funding. The time-series of the profit ratios for the characteristic-matched control hotels assigned to each of the subject hotels are measured on the same timeline, reaching from five years prior to the PE investment in a given subject hotel to five years following that investment. The hotel performance data used to produce this figure are from CBRE.



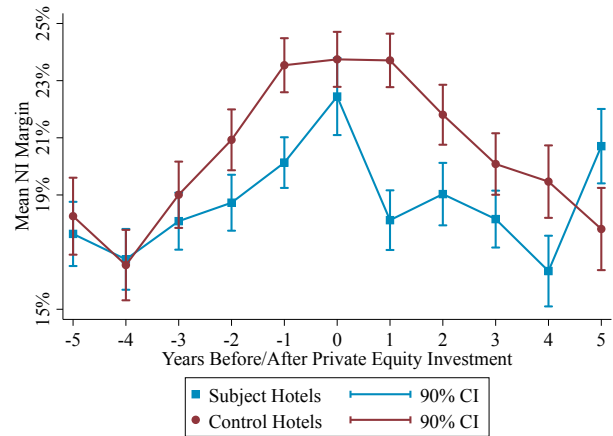
(A) Departmental Profit



(B) Gross Operating Profit



(C) EBITDA



(D) Net Income

Figure 7. Distribution of Buyer Types for Private Equity and Non-Private Equity Sellers

This figure depicts the frequency distribution of buyer types for sellers in the private equity investor category versus that for sellers in other investor categories by the numbers of completed transactions over the 2001–2019 period. When a given transaction record shows multiple buyers (sellers) we categorize this deal as completed by the buyer (seller) type of the first buyer (seller) listed in the RCA data base. Buyer and seller types are also defined in the RCA hotel transactions data used to produce this figure.

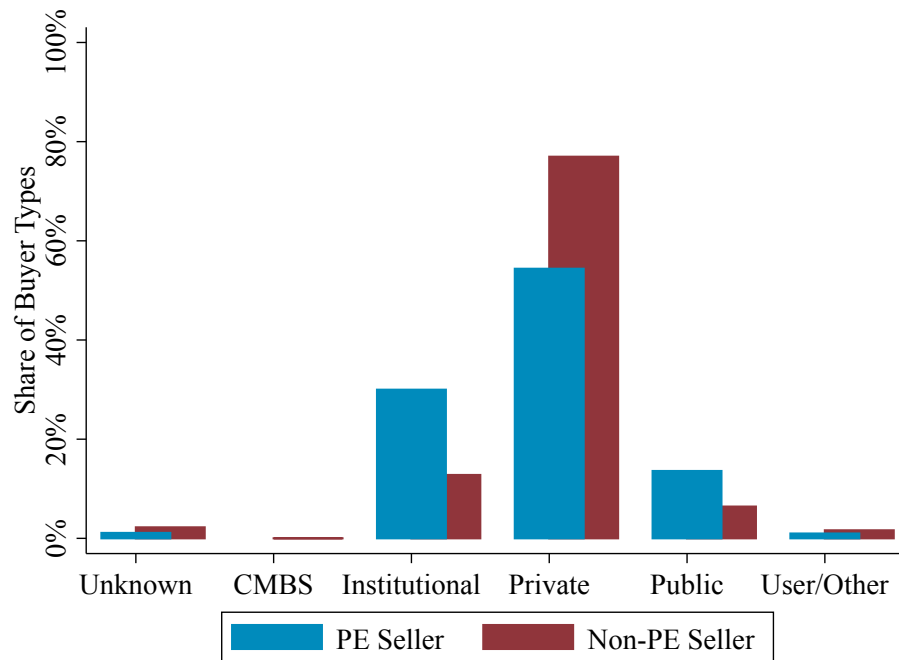


Table 1. Composition of Hotel Transactions Database**Panel A.** Distribution over Transaction Types

	N
Single	18,790
Portfolio	5,637
Entity-level	2,450
Total	26,877

Panel B. Top-10 Cities and Hotel Franchises

City	N	Franchise	N
Houston	360	<Independent hotel>	4,945
New York	323	Hampton Inn & Suites	1,078
Orlando	286	Courtyard by Marriott	968
San Antonio	246	Holiday Inn Express	960
Miami Beach	239	Residence Inn by Marriott	891
San Francisco	236	Motel 6	767
Phoenix	221	Holiday Inn	748
Las Vegas	208	Fairfield Inn by Marriott	744
San Diego	206	Quality Inn	726
Los Angeles	202	Comfort Inn	712

Panel C. Top-10 Buyer Types and Buyers

Buyer Type	N	PE Buyer	N	Non-PE Buyer	N
Developer/Owner/Operator	17,131	Blackstone	1,380	N/A	589
Equity Fund	4,026	Starwood Capital	513	Apple REIT	309
REIT	1,538	Goldman Sachs	404	China Life	195
Non Traded REIT	899	JER Partners	151	AccorInvest	170
Investment Manager	875	RLJ Development	147	Ashford Hospitality Trust	149
<unknown>	506	Five Mile Capital	119	Colony Capital (REIT)	149
REOC	446	Apollo Global RE	93	Hospitality Investors Trust	148
Insurance	244	Noble Investment Group	87	Kimco	135
Corporate	219	Dune RE Partners LP	77	AHIP REIT	129
High Net Worth	206	Cerberus	72	InvenTrust	126

Panel D. Presence of PE Buyer or Seller

	PE Seller	Non-PE Seller
PE Buyer	384	4,006
Non-PE Buyer	2,408	20,079

Table 2. Descriptive Statistics on Hotel Transactions**Panel A.** Descriptive Statistics Transacted Hotels

	N	Mean	S.D.	P10	P25	P50	P75	P90
Construction Year	25,861	1983.72	24.69	1959	1975	1988	1999	2006
Rooms	26,824	142.56	156.93	52	75	109	150	256

Panel B. Descriptive Statistics Transactions

	N	Mean	S.D.	P10	P25	P50	P75	P90
Price (USD)	26,877	19,981,658	74,108,789	2,500,000	3,500,000	6,150,000	13,903,166	36,043,360
Cap Rate	3,408	0.086	0.021	0.058	0.074	0.086	0.100	0.113

Table 3. Simplified Hotel Profit and Loss Statement Following USALI

This table presents the structure of a typical hotel profit and loss statement following the Uniform System of Accounts for the Lodging Industry (USALI). The column on the left shows the individual revenue and expense items in the different hotel operating departments, the overhead expenses associated with the operation of the hotel that cannot be assigned to any of the individual operating departments (undistributed expenses), the expenses associated with the ownership of the real estate (non-operating expenses), and the expenses associated with financing and taxation of the hotel (fixed charges). The column on the right shows the calculation of key hotel profit measures by subtracting the various expense components from total hotel revenues (total departmental income). The annual CBRE hotel benchmarking survey, which contains the hotel operating performance data we use in this study, follows the USALI reporting structure outlined here.

Rooms Revenue	
+ Food & Beverage Revenue	
+ Other Operating Revenue	
	Total Departmental Revenues
Rooms Expense	
+ Food & Beverage Expense	
+ Other Operating Expense	
	– Total Departmental Expenses
	= Total Departmental Income
A&G Expense	
+ IT Expense	
+ Marketing Expense	
+ Maintenance Expense	
+ Utility Expense	
	– Total Undistributed Expenses
	= Gross Operating Profit
Management Fee	
+ Property Tax	
+ Insurance	
+ Rent Expense	
+ Other Non-Operating Expenses	
	– Total Non-Operating Expenses
	= EBITDA
Interest Expense	
+ Amortization & Depreciation	
+ Income Taxes	
	– Total Fixed Charges
	= Net Income

Table 4. Descriptive Statistics on Hotel Performance Measures

This table presents descriptive statistics for the annual operating performance measures of the subject and control hotels included in our empirical analyses over the 2000–2018 period. Panel (A) presents hotel top-line performance measures. These encompass the log average daily rate (ADR), the occupancy rate, and revenue per available room (RevPAR, computed as the product of raw ADR and occupancy). Panel (B) shows hotel expense ratios. These encompass departmental, undistributed, and non-operating expenses, as well as fixed charges. Panel (C) shows hotel profit measures. These encompass departmental profit (Dept.), gross operating profit (GOP), EBITDA, and net income (NI). All annual expense and profit measures shown are scaled by contemporaneous total hotel revenues. All Hotel performance data are from CBRE. Hotel ownership data are from RCA. The hotel performance variables shown are winsorized at the 1st and 99th percentiles.

Panel A. Top-Line Performance

	Subject Hotels			Control Hotels		
	Mean	SD	N	Mean	SD	N
ADR	4.68	0.41	7,524	4.64	0.38	8,882
Occupancy	0.70	0.10	7,524	0.70	0.10	8,882
RevPAR	4.31	0.50	7,524	4.28	0.45	8,882

Panel B. Expense Ratios

	Subject Hotels			Control Hotels		
	Mean	SD	N	Mean	SD	N
Departmental	0.30	0.09	7,524	0.30	0.09	8,882
Undistributed	0.28	0.06	7,524	0.28	0.06	8,882
Non-Operating	0.12	0.09	7,524	0.14	0.12	8,882
Fixed	0.09	0.11	7,524	0.09	0.11	8,882

Panel C. Profit Measures

	Subject Hotels			Control Hotels		
	Mean	SD	N	Mean	SD	N
Dept.	0.70	0.09	7,524	0.70	0.09	8,882
GOP	0.42	0.11	7,524	0.42	0.11	8,882
EBITDA	0.30	0.14	7,524	0.28	0.16	8,882
NI	0.21	0.18	7,524	0.19	0.19	8,882

Table 5. Top-Line Hotel Performance under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is the log average daily rate (ADR) in the first specification, the occupancy rate in the second specification, and revenue per available room (RevPAR, computed as the product of raw ADR and occupancy) in the final specification. *PE* is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. *PostPE* is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, *PostPE* equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Hotel performance data are from CBRE. Hotel ownership data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	ADR (1)	Occupancy (2)	RevPAR (3)
<i>PE $\times$ Post PE</i>	0.008 (1.36)	-0.003 (-1.13)	0.003 (0.38)
Post PE	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand
Observations	16,397	16,397	16,397
Adj. R-Squared	0.97	0.70	0.94

Table 6. Hotel Expense Ratios under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is the ratio of departmental expenses to total hotel revenues in the first specification, the ratio of undistributed expenses to total hotel revenues in the second specification, the ratio of non-operating expenses to total hotel revenues in the third specification, and the ratio of fixed charges to total hotel revenues in the final specification. *PE* is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. *PostPE* is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, *PostPE* equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Hotel performance data are from CBRE. Hotel ownership data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Departmental (1)	Undistributed (2)	Non-Operating (3)	Fixed (4)
<i>PE</i> $\times$ <i>Post PE</i>	-0.009 (-3.40)	0.007 (1.48)	0.010 (1.48)	0.006 (0.57)
Post PE	Yes	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand	Brand
Observations	16,397	16,397	16,397	16,397
Adj. R-Squared	0.89	0.76	0.45	0.68

Table 7. Hotel Profit Ratios under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is the ratio of departmental profit to total hotel revenues in the first specification, the ratio of gross operating profit (GOP) to total hotel revenues in the second specification, the ratio of EBITDA to total hotel revenues in the third specification, and the ratio of net income (NI) to total hotel revenues in the final specification. *PE* is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. *PostPE* is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, *PostPE* equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Hotel performance data are from CBRE. Hotel ownership data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Departmental (1)	GOP (2)	EBITDA (3)	NI (4)
<i>PE</i> $\times$ <i>Post PE</i>	0.009 (3.40)	0.003 (0.56)	-0.004 (-0.48)	-0.009 (-0.56)
Post PE	Yes	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand	Brand
Observations	16,397	16,397	16,397	16,397
Adj. R-Squared	0.89	0.81	0.61	0.58

Table 8. Hotel Labor Expenses and Employment under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is the ratio of total labor expenses to total hotel revenues in the first specification, the ratio of labor expenses in the rooms department to total hotel revenues in the second specification, the ratio of labor expenses in the food and beverage (F&B) department to total hotel revenues in the third specification, the ratio of labor expenses in other operating departments to total hotel revenues in the fourth specification, and the log of the number of hotel employees in the final specification. *PE* is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. *PostPE* is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, *PostPE* equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Hotel performance data are from CBRE. Hotel ownership data are from RCA. Data on hotel employment are from YTS. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Total (1)	Rooms (2)	F&B (3)	Other (4)	Employment (5)
<i>PE</i> $\times$ <i>Post PE</i>	-0.005 (-2.26)	-0.003 (-2.16)	-0.001 (-0.71)	-0.000 (-1.02)	-0.053 (-0.67)
Post PE	Yes	Yes	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand	Brand	Brand
Observations	15,249	15,249	15,249	15,249	4,272
Adj. R-Squared	0.86	0.81	0.97	0.77	0.85

Table 9. Hotel Undistributed Expenses under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is the ratio of administrative and general (A&G) expenses to total hotel revenues in the first specification, the ratio of information technology (IT) expenses to total hotel revenues in the second specification, the ratio of sales and marketing (Sales) expenses to total hotel revenues in the third specification, the ratio of maintenance (Maint.) expenses to total hotel revenues in the fourth specification, and the ratio of utilities (Util.) expenses to total hotel revenues in the final specification. *PE* is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. *PostPE* is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, *PostPE* equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Hotel performance data are from CBRE. Hotel ownership data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	A&G (1)	IT (2)	Sales (3)	Maint. (4)	Util. (5)
<i>PE $\times$ Post PE</i>	0.001 (0.53)	0.000 (0.21)	0.008 (2.29)	-0.002 (-2.58)	-0.000 (-0.33)
Post PE	Yes	Yes	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand	Brand	Brand
Observations	16,397	16,397	16,397	16,397	16,397
Adj. R-Squared	0.63	0.62	0.85	0.67	0.80

Table 10. Transaction Pricing in Repeat Sales as a Function of Buyer and Seller Types

This table reports output from Eq. (2), estimated over the repeat sales transactions in our sample. The dependent variable is the difference between the log acquisition price per room and the subsequent log disposition price per room for a given hotel. *PE Seller* is an indicator that takes the value of one if the seller in a given transaction is a PE investor, and zero otherwise. *PE Buyer* is an indicator that takes the value of one if the buyer in a given transaction is a PE investor, and zero otherwise. *Institutional* (respectively, *Private*, *Public*, and *User/Other*) is an indicator that takes the value of one if the buyer in a given transaction is an institutional (respectively, private, public, or user/other) investor, and zero otherwise. *Rooms* is the log number of rooms of the hotel traded in a given transaction. *CBD* is an indicator that takes the value of one if a given hotel is located in the central business district (CBD) of its local market, and zero otherwise. *Full-Service* is an indicator that takes the value of one if a given hotel is a full-service hotel, and zero otherwise (if it is a limited-service hotel). Fixed effects for the length of the holding period (in years) in a given repeat-sales transaction and region $\times$ sale year fixed effects are included as indicated. All regressions are estimated over the 2001–2019 period. Hotel transactions data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Δ Price (1)	Δ Price (2)	Δ Price (3)
<i>PE Seller</i>	0.094 (2.13)	0.094 (2.12)	0.071 (1.40)
<i>PE Buyer</i>		0.011 (0.33)	
<i>Institutional</i>			0.033 (0.54)
<i>Private</i>			0.023 (0.46)
<i>Public</i>			0.304 (3.58)
<i>User/Other</i>			0.093 (1.42)
<i>Rooms</i>	-0.007 (-0.55)	-0.008 (-0.63)	-0.017 (-1.35)
<i>CBD</i>	0.180 (5.57)	0.180 (5.46)	0.163 (4.72)
<i>Full Service</i>	0.064 (2.74)	0.064 (2.73)	0.061 (2.57)
<i>Constant</i>	0.097 (1.62)	0.099 (1.73)	0.107 (1.55)
Holding Period Fixed Effects	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand
Observations	8,045	8,045	8,011
Adj. R-Squared	0.18	0.18	0.19

Table 11. Hotel Capital Expenditures under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is an indicator that takes the value of one if hotel i experiences any additions in year t , and zero otherwise, in the first specification, an indicator, analogously defined, for alterations in the second specification, an indicator, analogously defined, for conversions in the third specification, and an indicator, analogously defined, for new construction in the final specification. PE is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. $PostPE$ is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, $PostPE$ equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Data on capital expenditures are from Dodge Data & Analytics. Hotel ownership data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Additions (1)	Alterations (2)	Conversions (3)	New Construction (4)
$PE \times Post\ PE$	-0.000 (-0.05)	0.001 (0.22)	-0.000 (-0.52)	0.002 (0.32)
Post PE	Yes	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	No	No	No	No
S.E. Clustered By	Brand	Brand	Brand	Brand
Observations	11,611	11,611	11,611	11,611
Adj. R-Squared	0.00	-0.00	0.01	-0.02

Table 12. Hotel Guest Satisfaction under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is the overall guest ratings score in the first specification, the ratings score for service quality in the second specification, the ratings score for cleanliness in the third specification, and the ratings score for sleep quality in the final specification. Ratings scores take values from one through five. *PE* is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. *PostPE* is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, *PostPE* equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Hotel ratings scores are from Tripadvisor. Hotel ownership data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Overall (1)	Service (2)	Cleanliness (3)	Sleep Quality (4)
<i>PE $\times$ Post PE</i>	0.002 (0.03)	-0.040 (-1.11)	0.009 (0.20)	0.052 (1.26)
Post PE	Yes	Yes	Yes	Yes
Hotel Fixed Effects	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand	Brand
Observations	6,374	6,306	6,305	4,468
Adj. R-Squared	0.45	0.38	0.42	0.39

Table 13. Financing Terms as a Function of Borrower Type

This table reports output from Eq. (5). The dependent variable is the hotel mortgage interest rate in the first specification, the loan term in the second specification, the debt-service coverage ratio (DSCR, computed as the annual hotel EBITDA divided by total debt service) in the third specification, and the loan-to-value ratio (LTV) at underwriting in the final specification. *PE Borrower* is an indicator that takes the value of one if the borrower in a given financing transaction was a PE investor, and zero otherwise. *Price* is the log price per room of the hotel financed in a given transaction. If a transaction is a refinancing deal, rather than a mortgage origination at acquisition, *Price* is the appraised log value per room of the hotel being financed. Hotel fixed effects, lender fixed effects, and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2001–2019 period. Hotel financing data are from RCA. Robust t-statistics, reported in parentheses, are based on standard errors clustered by hotel brand.

	Interest Rate (1)	Loan Term (2)	DSCR (3)	LTV (4)
<i>PE Borrower</i>	-0.002 (-2.69)	-0.068 (-1.10)	0.277 (2.74)	0.000 (0.01)
<i>Price</i>	-0.000 (-0.49)	0.042 (0.89)	0.173 (1.86)	-0.032 (-2.95)
<i>Constant</i>	0.058 (9.37)	3.637 (6.69)	0.370 (0.34)	0.984 (7.98)
Hotel Fixed Effects	Yes	Yes	Yes	Yes
Lender Fixed Effects	Yes	Yes	Yes	Yes
Region $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes
S.E. Clustered By	Brand	Brand	Brand	Brand
Observations	3,689	7,647	4,574	5,800
Adj. R-Squared	0.83	0.67	0.72	0.57

Appendix A The Timing of the Effects of Private Equity Investors on Hotel Performance

The evidence presented in Section 3.3 suggests limited improvements in hotel operating performance following PE investments. However, it is possible that PE investors implement gradual changes to hotel operations during the course of their holding period, the benefits of which affect performance slowly over time. To investigate this possibility, we estimate the following regression specification:

$$y_{i,t} = \alpha + \sum_{k=0}^K \beta_k PE_i \times PostPE_{i,t}^k + \gamma PostPE_{i,t} + \delta_i + \theta_{l,t} + \epsilon_{i,t} \quad (A.1)$$

where β_k denotes the coefficient of interest on the interaction term between the subject hotel indicator PE_i and the PE investment indicator $PostPE_{i,t}^k$ in year $k = 0, 2, \dots, 5$. We estimate Eq. (A.1) for the five years leading up to and the five years following PE investments in the subject hotels. The specification in Eq. (A.1) thus allows us to identify the impact of PE investments on hotel performance measures in the year a given subject hotel received PE funding ($k = 0$) and in each of the subsequent five years ($k = 1, 2, \dots, 5$) by comparison to the performance outcomes achieved on average over the five years prior to that hotel receiving PE funding. The values of $PostPE_{i,t}^k$ for the control hotels are again determined by the timing of PE investments in the characteristic-matched subject hotels. The remaining variables and notation are as in Eq. (1).

We summarize the results of estimating Eq. (A.1) for the sample hotels graphically. Figures A.1 through A.3 depict the annual coefficient estimates for β^k , which measure the year-specific impacts of private equity investments on hotel performance measures from the year of PE investment (denoted as year 0) up to five years following that initial investment.

[Insert Figures A.1, A.2, and A.3 about here.]

Figure A.1 presents the results for hotel top-line performance measures. The graph shows that ADR increases slightly in year two of PE ownership but that the effect of PE investors on average room rates is indistinguishable from zero in all other years of their involvement in the subject hotels (Panel A). By contrast, the effects of PE ownership on occupancy are slightly negative in years one, two, and three of their holding period, but turn numerically positive in years four and five (Panel B). The inverse patterns in the effects of PE ownership on ADR and occupancy are intuitive as higher room rates lead to lower demand for rooms. The impact of PE ownership on RevPAR is statistically zero in the year of their initial investments and remains zero during the subsequent five years.

In Figure A.2, we summarize the estimation results from Eq. (A.1) for hotel expense ratios. Panel A shows that the positive impact of PE ownership on departmental expense ratios is swift and lasting, starting in year one of their ownership. This positive impact also becomes stronger over time, as Panel A of Figure A.2 shows a continuing decline in departmental expense ratios through year five of PE ownership. Panels B through D of Figure A.2 depict the annual impacts of PE investments on hotel undistributed expenses, non-operating expenses, and fixed charges. The figures show some volatility in the annual

effects of PE ownership on those measures of hotel operating efficiency but, consistent with the evidence presented in Section 3.3, few systematic patterns or statistically significant effects emerge.

Figure A.3 replicates the graphical depiction of the regression results from Eq. (A.1) for hotel profit ratios. Panel A shows the resulting immediate and persistent increase in departmental profit ratios starting from year one of PE ownership in the subject hotels. This result is consistent with our earlier finding that PE ownership has a swift and lasting positive effect on departmental expenses. By contrast, Panel B of Figure A.3 again suggests that this lead in performance on the level of departmental profits is lost as soon as undistributed expenses are considered in gross operating profit. Panels C (EBITDA) and D (net income) confirm our earlier finding that PE ownership is of limited consequence for bottom-line profit measures, even after considering potential time-series variation in any such effects.

Figure A.1. Timing Effects of Private Equity Investment on Top-Line Performance

This figure depicts the annual marginal effects of PE ownership on the top-line performance of the subject hotels relative to their characteristic-matched control hotels, with 90% confidence intervals drawn around the point estimates. Panel (A) shows the effects on the natural logarithm of the annual average daily rate (ADR). Panel (B) shows the effects on the annual average occupancy rate. Panel (C) shows the effects on the natural logarithm of the annual average revenue per available room (RevPAR, computed as $\text{ADR} \times \text{occupancy}$). The annual marginal effects shown are derived from the regression specification in Eq. (A.1), estimated over the five years leading up to and the five years following PE investments in the subject hotels. Thus, each estimated marginal effect captures the impact of PE investments on hotel performance in a given year of PE ownership, compared to the average performance in the five years leading up to the PE investments in the subject hotels. The time-series of the performance data for the characteristic-matched control hotels assigned to each of the subject hotels are measured on the same timeline, defined by the PE investments in the subject hotels. The data used to produce this figure are from CBRE and RCA, respectively.

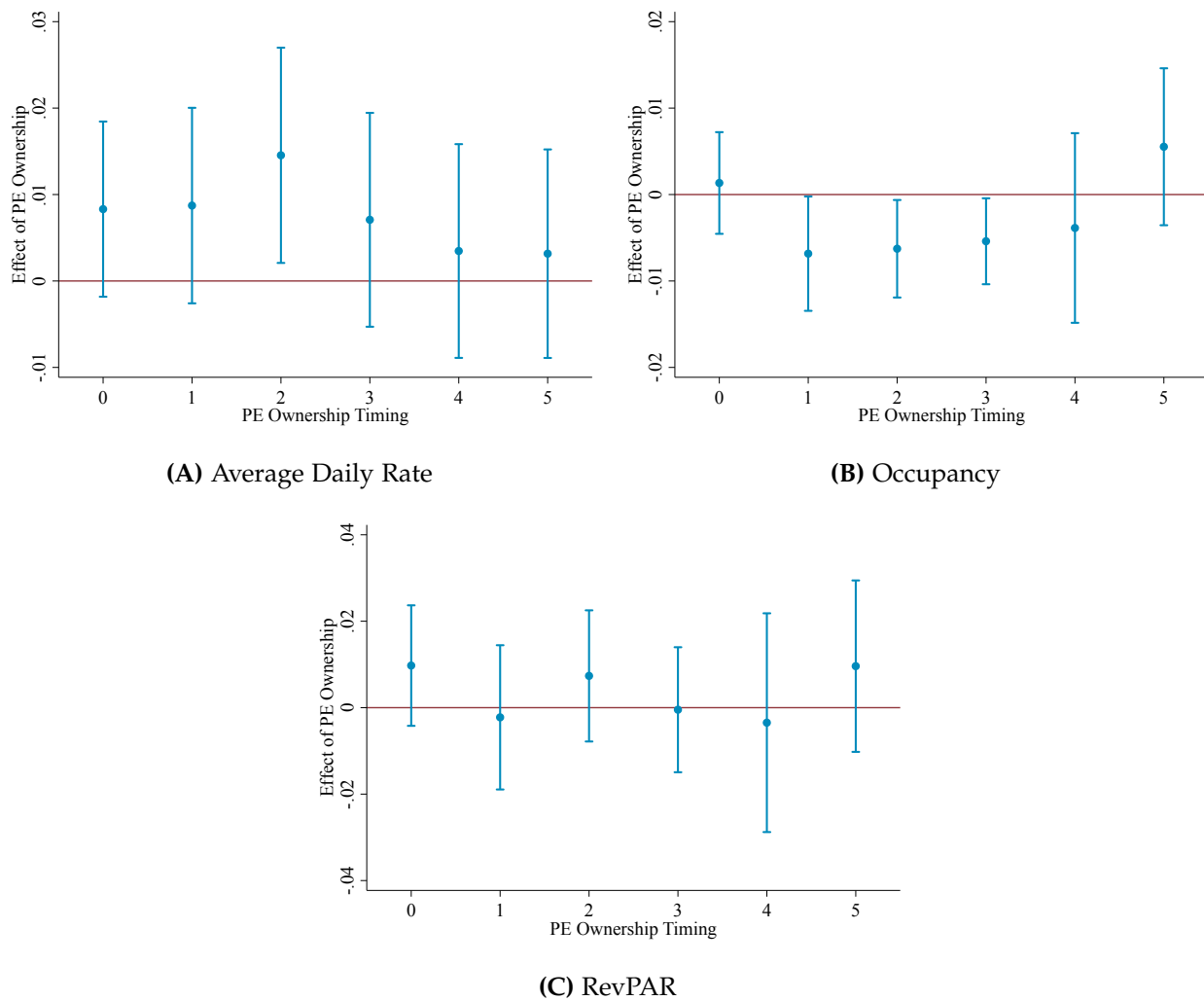


Figure A.2. Timing Effects of Private Equity Investment on Expense Ratios

This figure depicts the annual marginal effects of PE ownership on the expense ratios of the subject hotels relative to their characteristic-matched control hotels, with 90% confidence intervals drawn around the point estimates. Panel (A) shows the effects on the ratio of departmental expenses to total hotel revenues. Panel (B) shows the effects on the ratio of undistributed expenses to total hotel revenues. Panel (C) shows the effects on the ratio of non-operating expenses to total hotel revenues. Panel (D) shows the effects on the ratio of fixed charges to total hotel revenues. The annual marginal effects shown are derived from the regression specification in Eq. (A.1), estimated over the five years leading up to and the five years following PE investments in the subject hotels. Thus, each estimated marginal effect captures the impact of PE investments on hotel performance in a given year of PE ownership, compared to the average performance in the five years leading up to the PE investments in the subject hotels. The time-series of the performance data for the characteristic-matched control hotels assigned to each of the subject hotels are measured on the same timeline, defined by the PE investments in the subject hotels. The data used to produce this figure are from CBRE and RCA, respectively.

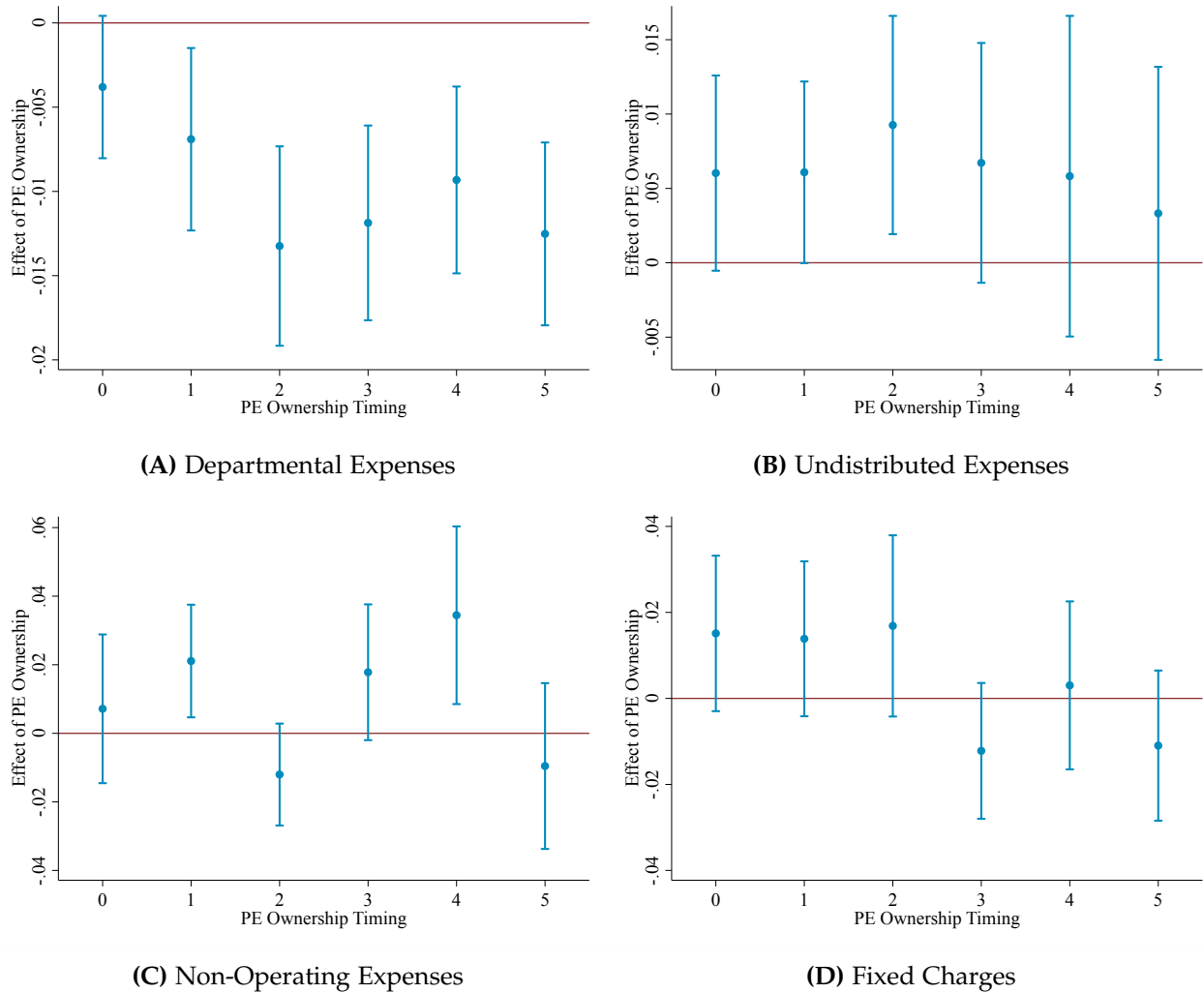
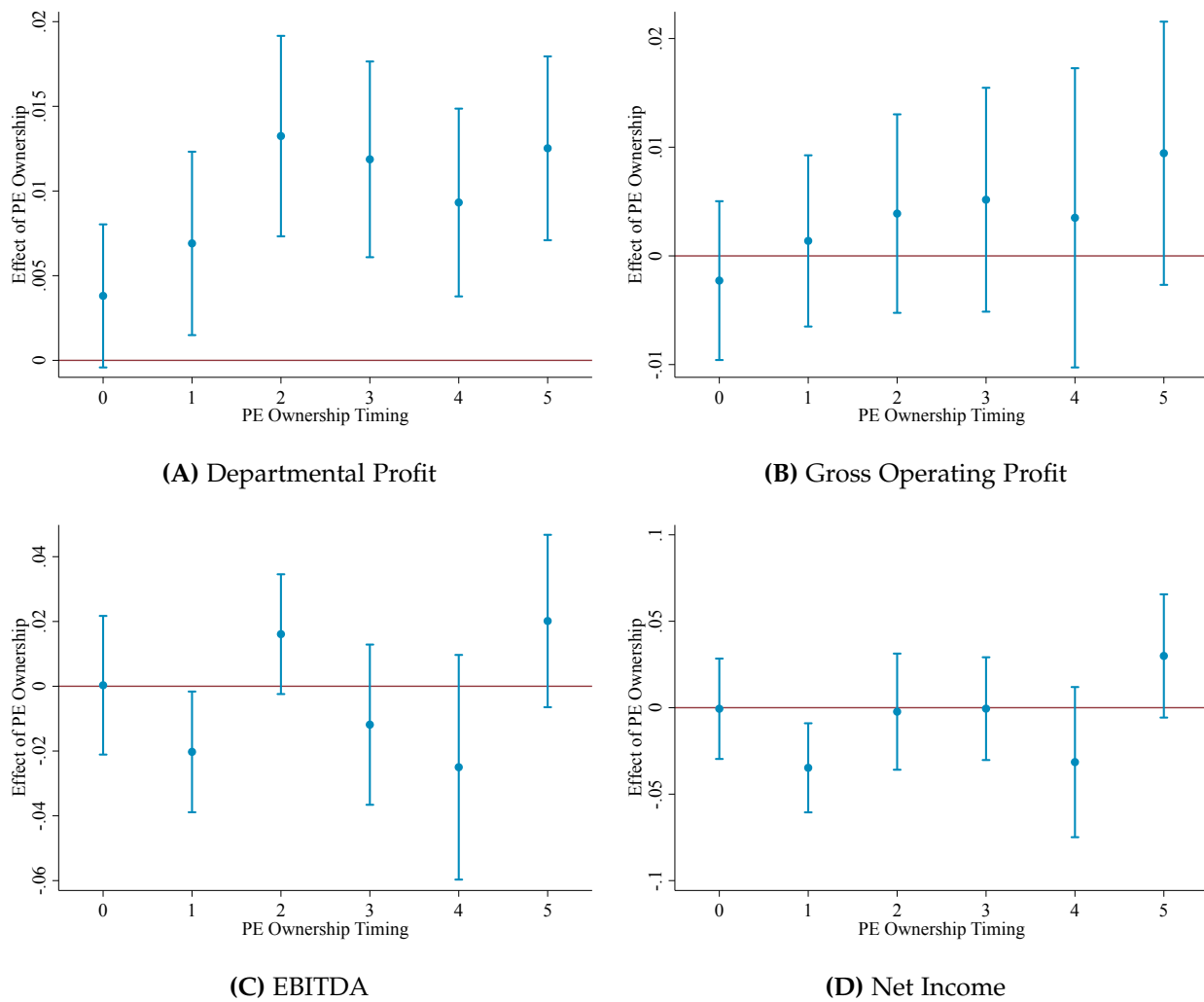


Figure A.3. Timing Effects of Private Equity Investment on Profit Measures

This figure depicts the annual marginal effects of PE ownership on the profit ratios of the subject hotels relative to their characteristic-matched control hotels, with 90% confidence intervals drawn around the point estimates. Panel (A) shows the effects on the ratio of departmental profits to total hotel revenues. Panel (B) shows the effects on the ratio of gross operating profits to total hotel revenues. Panel (C) shows the effects on the ratio of EBITDA to total hotel revenues. Panel (D) shows the effects on the ratio of net income to total hotel revenues. The annual marginal effects shown are derived from the regression specification in Eq. (A.1), estimated over the five years leading up to and the five years following PE investments in the subject hotels. Thus, each estimated marginal effect captures the impact of PE investments on hotel performance in a given year of PE ownership, compared to the average performance in the five years leading up to the PE investments in the subject hotels. The time-series of the performance data for the characteristic-matched control hotels assigned to each of the subject hotels are measured on the same timeline, defined by the PE investments in the subject hotels. The data used to produce this figure are from CBRE and RCA, respectively.



Appendix B The Effects of Private Equity Investors on Hotel Management

Table B.1. Changes in Hotel Management Companies under Private Equity Ownership

This table reports output from Eq. (1). The dependent variable is an indicator that takes the value of one if a given hotel experiences a change in the management company responsible for its day-to-day operations between year $t-1$ and year t , and zero otherwise. The first specification presents output from a logit model. The second specification presents output from a linear probability model (LPM). PE is an indicator that takes the value of one for hotels in the subject group and zero for hotels in the control group. $PostPE$ is an indicator that takes the value of one starting with the year in which a PE investor first acquires a subject hotel and zero before then. For control hotels, $PostPE$ equals one starting with the year in which a PE investor first acquires their matched subject hotels and zero before then. Hotel and region $\times$ year fixed effects are included as indicated. All regressions are estimated over the 2000–2018 period. Data on the identity of hotel management companies running the daily operations in the subject and control hotels in our sample are from CBRE. Hotel ownership data are from RCA. Robust z-statistics in column (1) (t-statistics in column (2)), reported in parentheses, are based on standard errors clustered by hotel brand.

	Logit (1)	LPM (2)
$PE \times Post\ PE$	0.722 (2.87)	0.025 (3.01)
Post PE	Yes	Yes
Hotel Fixed Effects	No	Yes
Region $\times$ Year Fixed Effects	No	Yes
S.E. Clustered By	Brand	Brand
Observations	16,406	16,397
Adj. R-Squared	0.05	0.09