

The Effect of Lodging Taxes on the Performance of US Hotels

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Abstract

The objective of this article is to analyze the impact of lodging taxes on the performance of US hotels by looking at the two key market segments involved. The empirical application conducted on a sample of more than 7,000 observations corresponding to more than 100 urban submarkets from 2013 to 2018 finds that lodging taxes have a more negative effect on hotel performance (RevPar) for group bookings than for transient bookings. As groups usually have greater flexibility regarding the location of events, they can more easily choose a different destination if a tax increase is observed. To prevent this possibility hotels may be more inclined to offer discounts to groups, thereby absorbing some of the tax increase. The results obtained have relevant managerial implications, which are discussed.

Keywords

lodging taxes, hotel performance, segmentation

Introduction

COVID-19 is dramatically affecting federal, state, and local government revenues. Under increased pressure to find new revenues, government policy makers will almost certainly be tempted to increase taxes on lodging accommodations as a way to raise revenues without burdening local residents. The conversation around the pros and cons of lodging taxes is likely to be reignited in the weeks and months ahead. The travel and tourism sector, including the hotel industry, is however already struggling (Assaf and Scuderi 2020; Sharma and Nicolau 2020). Research is needed to identify the key issues relevant to the effects of lodging taxes.

As US policy makers in the late 1970s and 1980s increasingly saw in travel destinations the potential for tax revenue, what inevitably followed across many municipalities was the passing of legislation that imposed various forms of taxes on nonresidents visiting these regions. By 1990, 46 states had levied one such tax—the hotel room tax (Hiemstra and Ismail 1992). On the surface, the taxing of lodging facilities indeed appears to be highly desirable for local communities. An argument often made by policy makers is that these taxes have the potential to benefit locals while shifting the costs to nonresident visitors. Whether this argument is truly valid, however, has been debated over the years. In order to answer this question more conclusively, there is a need for studies that encompass wider geographical areas while recognizing key differences in customer types.

Nevertheless, despite the continued uncertainty surrounding the supposed benefits of imposing short-term taxes of

lodging accommodations, these *ad valorem* (sales) taxes remain both pervasive and significant even today. These taxes include both general sales taxes, imposed primarily by state governments, and lodging taxes imposed specifically on lodging accommodations. Of the 50 US states, 37 imposed a general sales tax on lodging accommodations in 2017 (Hazinski, Davis, and Kremer 2018); 22 states imposed a specific lodging tax; and 10 imposed both. State taxes, including both general sales taxes and lodging taxes, ranged from 0% in Alaska and California to 15% in Connecticut. Moreover, sales and particularly lodging taxes are imposed not only by state governments but also by other political jurisdictions including counties, cities and special taxing districts. In a 2017 analysis of the 150 largest US urban centers conducted by HVS Global Hospitality Services (HVS), all had some form of sales or lodging tax on lodging accommodations, ranging from a low of 8% in Fontana, CA, to 17.9% in St Louis, MO (Hazinski, Davis, and Kremer 2018). Of the 150 urban centers, 119 collected a state tax, 75 a county tax, 124 a city tax, and 44 collected special tax district taxes; 17 cities collected all four types of taxes and another 43

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collected three of the four. Across the 150 urban centers, the average tax rate was 13.8%.

In many ways, the widespread prevalence of hotel taxes is not particularly surprising. As previously noted, these taxes are not directly paid by local residents and at the same time are frequently seen as a ready source of revenue. Collections from lodging taxes are often used for building convention centers, to purchase resources that may be used by tourists, and also for the promotion of tourism (Hiemstra and Ismail 1990). Proceeds may also sometimes be allocated toward a general fund (Spengler and Uysal 1989), where expenditures may be more unclear. The provision for general expenditures presumably permits considerable flexibility in how the monies are spent, thus making lodging taxes an even more attractive revenue source for local and state governments in need of more funding. In response to budget shortfalls resulting from the 2008–2009 financial crisis, for instance, several states increased tax rates (Johnson, Collins, and Singham 2010). State and local governments are likely to adopt a similar response to the ongoing economic crisis stemming from the COVID-19 pandemic.

In understanding the impacts of lodging taxes, the key underlying issue is the tax *incidence*, defined as the division of the lodging tax burden between the lodging guests and providers (Dwyer, Forsyth, and Dwyer 2010). Much of the lodging tax debate in policy circles assumes that 100 percent of the tax burden is shifted to the lodging consumers. This would not necessarily be the case. When hotels experience a tax increase, they have two options. First, they can add the tax to their current prices fully impacting the final price (original price + tax). To the extent that their demand is elastic, this would result in some decline in occupancy rate (the percentage of available rooms that are sold). Second, they can reduce their current prices so that the final price is still competitive when the new increased tax rate is added; hotels can reduce their prices so that the addition of the room rate plus taxes is still competitive. This strategy would maintain the occupancy rate but could negatively impact their ADR (average daily rate). In either case, to the extent that demand is elastic, the hotel would experience some loss in its RevPar (revenue per available room). In fact, we can distinguish two different extreme scenarios: under perfectly inelastic demand for lodging, it may indeed be appropriate to assume that the full incidence of lodging taxes can be passed on to hotel guests without any negative effects on occupancy rate, ADR, or RevPar for either hotel owners or the communities in which the hotels are located. Conversely, if the demand for lodging is perfectly elastic much of the tax incidence would fall upon lodging providers, with potential ramifications for the entire destination. Under perfectly elastic demand, if hotels simply add the tax to existing rates, it is quite possible that hotel guests would forgo travel to that destination, choosing to stay in another destination or not travel, thereby reducing the hotel occupancy rate and RevPar. In this scenario, the impacts would be felt not only by the lodging

businesses but also by other businesses that benefit in part from sales to lodging guests. To the extent that the demand is elastic, hotels would rationally absorb some of the tax incidence by reducing their room rates such that the final (room rate plus taxes) price guests face would not increase by the full tax amount. The greater the competition and availability of substitute lodging, the more elastic the demand (S. K. Lee 2014) and the greater the likelihood that lodging providers will need to absorb some of the lodging tax burden in order to remain competitive, but potentially negatively affecting their ADR and RevPar. To the extent that the reduced ADR grows occupancy, it is possible for RevPar to be unaffected or, in fact, grow.

Research to measure the incidence of lodging taxes is considerably more complex than this admittedly simplistic theoretical framework. Because of differences in methodology and underlying assumptions, the existing research has found mixed results. While some studies have claimed that the implementation of hotel taxes does not alter the demand for travel (i.e., Combs and Elledge 1979; Bonham and Gangnes 1996; Aguilo, Riera, and Rossello 2005; Hudson et al. 2019), others conclude that these taxes can significantly affect hotel performance (i.e., Mak and Nishimura 1979; Fujii, Khaled, and Mak 1985; Hiemstra and Ismail 1992, 2001; S. K. Lee 2014). As indicated, likely reasons for these inconclusive results are (1) differences in methodology and (2) the fact that much of the existing research tends to be limited to specific destinations. A comprehensive set of destinations that would allow the analyst to discern the different effects of taxes on hotel demand is needed.

The objective of this article is to address two key gaps in the lodging tax research. First, this article reports on a large ex post study examining the effects of ad valorem taxes on hotel performance in the USA. By merging data available from HVS and Smith Travel Research (STR), this research examined the effects of ad valorem taxes on hotel performance across multiple cities over a period of six years. Second, this research estimated the effects of ad valorem taxes on hotel performance both overall and by comparing transient and group business. Because our data are sorted by the two primary hotel market segments (group and transient bookings), we are able to realize this very specific objective. In fact, our hypothesis focuses on how tax rates affect these two primary markets for hotels—although we managed to find literature that supports our arguments, no research has tested this hypothesis so far. Consequently, the inclusion of these two primary market segments into this body of research is a substantive contribution of this study. Moreover, the richness of our data eliminates the need to make rigid suppositions and, therefore, permits more generalizable inferences. Note that while taxes are prevalent costs, we observe the variability of tax rates across multiple submarkets in the United States to examine their impact on lodging demand, allowing us to be more confident about the generalizability and representativeness of our findings.

An Overview of the Lodging Tax Research

Lodging taxes are typically levied separately from any state sales tax and are thus an added cost for hotel guests (S. K. Lee 2014). This additional cost that results from the tax creates a wedge between the price consumers pay and the price hotels receive (Dwyer, Forsyth, and Dwyer 2010)—a difference that on the surface appears unproblematic to government authorities when the tax is paid by nonresidents.

Beyond the apparent political comfort that hotel taxes provided to elected officials by seemingly shifting tax burden away from their voters (Bonham et al. 1992; Hiemstra and Ismail 1990, 1992; Jensen and Wanhill 2002; M. C. White 2011), whether lodging taxes are ultimately beneficial to local lodging providers and local communities has been a topic of debate for several decades. While much of this discourse has occurred in policy circles, the purported benefits of taxing travel services have—somewhat intermittently—also been discussed within the academic research literature. Relevant within this scholarship is the notion of tax incidence, stemming from the recognition that the true burden of such taxes may be distributed across multiple parties, and not merely hotel guests who do, of course, bear direct financial burden.

The conclusion that *all* of the incidence could conveniently be passed on to buyers holds under the untenable condition of perfect inelasticity of demand for hotel rooms, which for the most part is a hypothetical scenario usually described in economics text books primarily for illustrative purposes (see for instance Lipsey and Harbury 1992; Hirschey 2008). Conversely, the belief that the burden of lodging taxes would fall entirely on lodging providers would have merit under what would essentially be the theoretical and equally unlikely market involving a perfectly elastic demand for hotel rooms.

The extreme scenarios described above represent, of course, mere academic simplifications wherein several potentially relevant issues have been disregarded. An understanding of market conditions under perfect elasticity or perfect inelasticity is useful for explanatory purposes, but these extreme scenarios do not capture the considerably more intricate relationship between lodging taxes and hotel performance that exists in practice. This is because real-world demand and supply curves tend not to exhibit either perfect elasticity or perfect inelasticity—at least not across all price levels (Arnold 2010). Elasticity for most items, including tourism products, will in most cases lie in between the two ends that represent perfectly elastic and perfectly inelastic demand, respectively. As such, the burden of lodging taxes tends invariably to be shared between hotels and guests.

Hotels may indeed be able to pass on the burden to those consumers whose preferences may be described as sufficiently price-indifferent. But it is the hotel industry that may be forced to bear much of the burden if their guests are

relatively price sensitive (Dwyer, Forsyth, and Dwyer 2010). This is because even under the more plausible scenario where the demand is relatively elastic but not perfectly elastic, hotels would consider absorbing much of the tax by reducing their margins such that the total price guests face remain almost the same after a lodging tax is implemented.

If in this situation hotels decided against absorbing the tax, the ramifications of the resulting drop in demand would likely be felt destination wide. A possible consequence of passing on higher prices to guests that has been identified in the literature is what Combs and Elledge (1979) refer to as the “border problem”—a situation in which travelers, wary of the increased price resulting from the tax, would simply forgo accommodations at that destination, and prefer accommodations in neighboring jurisdictions that offer lower taxes (see also Spengler and Uysal 1989). Subsequently, not only would the hotels’ own factors of production including the local labor base be underutilized, but the other travel and tourism-reliant enterprises in the region would also incur lost business as a result of the accommodation tax. Indeed, S. K. Lee’s (2014) study of the Midland-Odesa shows that the imposition of a new hotel tax in one jurisdiction can have detrimental effects for lodging providers in that jurisdiction compared with neighboring jurisdictions. Although this study was admittedly conducted in a geographically localized area, its findings nonetheless provide striking insights into possible unforeseen consequences that can result from taxing accommodation services. Additionally, there is some evidence in the literature that suggests that taxes also impact tourist spending behaviors. Song, Seetaram, and Ye (2019), for instance, find that duties on air travel can result in reallocations of expenditures by tourists, including reduced at-destination spending on items such as accommodations and food. It is certainly possible that increases in hotel taxes might have a similar effect at the destination.

What is indeed evident is that it would be premature assume that the mere enactment of legislation levying taxes on lodging would necessarily have the effect intended by authorities. There are other complexities that must be considered before one can assertively conclude that such taxes are truly as beneficial as frequently claimed by policy makers when increasing taxes. Academic research has provided some guidance, although a deeper understanding of the implications of lodging taxes at a broader level involving wider geographical areas and different customer types is still lacking.

Two basic research methodologies exist in the research investigating the impacts of taxing lodging accommodations (Bonham and Gangnes 1996). *Ex ante* studies use econometric methodologies to estimate elasticities based on existing supply and demand patterns and then use those estimates to forecast the potential effects of a new lodging tax (i.e., Hiemstra and Ismail 1992). Alternatively, *ex post* studies estimate the effects of a tax after it has been imposed, comparing either before and after lodging results (i.e., Bonham

and Gangnes 1996) or hotel performance in the taxing district to hotel performance in a similar, but nontaxing, district (i.e., S. K. Lee 2014; Hudson et al. 2019). The *ex ante* studies can be large scale, examining a broad range of destinations, but tend to be case studies estimating supply and demand elasticities on the basis of existing hotel sales at a particular point in time (i.e., Hiemstra and Ismail 1992). The *ex post* studies tend to be longitudinal and measure actual tax effects but are typically limited by studying only one or a small set of destinations (i.e., Bonham and Gangnes 1996; S. K. Lee 2014). Regardless of methodology, however, what is clear is that price plays a critical role in determining the competitiveness of travel destinations and, therefore, their demand sensitivities (Dwyer and Forsyth 2011; Dwyer, Forsyth, and Rao 2000). As one might therefore expect, price is deservedly very central in this literature.

In one of the early studies in the literature on the effects of lodging taxes, Combs and Elledge (1979) assumed demand for accommodations to be nearly perfectly inelastic. Not surprisingly, this assumption resulted in findings that suggested taxing lodging facilities could raise revenue without any significant repercussions for the demand for lodging. Mak and Nishimura (1979) similarly argued that hotel taxes instituted by the state of Hawaii did not significantly disrupt the demand for lodging, as tourists choose instead to reduce other types of spending.

The need to better understand consumer elasticities with respect to lodging prices was nonetheless apparent. A handful of articles emerged thereafter recognizing that the tax incidence is likely shared between lodging providers and guests, and that the assumption of perfectly inelastic demand might be untenable. Consequently, the subsequent scholarship turned toward the estimation of elasticity, yet the findings across studies were frequently at odds. For example, Fujii, Khaled, and Mak (1985), using data from Hawaii, concluded that not all the burden of occupancy taxes could be exported to visitors. Bonham and Gangnes's (1996) study, also using data from Hawaii, investigated the *ex post* effect of an accommodation tax in a time series study, similarly finding that such taxes do not significantly dampen hotel revenues. Conversely, Hiemstra and Ismail (1993) concluded that much of the incidence of such taxes is absorbed by the hotel industry (see also Hiemstra and Ismail 2001).

More recently, in a study conducted at the Algraves region of Portugal, do Valle et al. (2012) provide some evidence that tourist taxes might potentially be effective, although how such taxes are earmarked may be an important factor in determining willingness to pay for such taxes. S. K. Lee (2014), using a spatial panel model analyzing data from the Midland–Odessa lodging region, found that lodging taxes are substantively disadvantageous to hotels in localities where taxes are higher in comparison with neighboring localities. On the other hand, Hudson et al (2019), in a study of eight destinations, did not detect significant evidence to suggest that increases in tax rates beyond that of nearby

competing cities may be economically disruptive for cities. Mills, Rosentraub, and Jakar (2019), using county-level data from the state of Florida, similarly argue that tourists are rather price insensitive in their demand for hotel rooms.

Several issues have confounded research initiatives in the domain of lodging taxes—issues that perhaps explain not only the relatively modest size of this literature but also the conflicting nature of results within it. First, as noted previously, the concepts of perfect inelasticity and perfect elasticity are mere academic constructs, and any elasticity estimates resulting from real world data would inevitably lie somewhere in between the two extremes (Arnold 2010). Even if estimates of a destination's demand elasticity might bear strongly toward either extreme, ascertaining the extent to which the incidence would be shared between lodging providers and hotel guests, with possible secondary effects for local communities resulting from any fall in demand is extremely challenging. While the studies in this literature that rely on overly simplistic estimates of elasticity might still provide considerable theoretical insights, any practical inferences must be made while exercising a certain degree of caution.

Second, many of the articles in this literature have not considered that different types of hotel guests likely exhibit different elasticities for the same type of accommodation. It would seem quite reasonable to expect, for instance, business travel to be less sensitive than leisure travel to modest changes in the price of accommodations (Quan 2002; Schamel 2012). Not surprisingly, a study conducted using data from Spain's Balearic Islands suggests that different nationalities exhibit different tourism price sensitivities (see Aguilo, Riera, and Rossello 2005), lending further support to the possibility that a better understanding of customer types might permit a deeper understanding of the effect of lodging taxes. One is similarly inclined to believe that transient and group travelers have different price sensitivities. This was exemplified, for instance, in the Professional Convention Management Association's boycott of New York City as a meetings destination in response to the city's high hotel taxes (McDowell 1993). There is some evidence that hotels may indeed be more concerned about possible loss of business from large group bookings who tend to be more price sensitive (see Anderson 2015), but sourcing data for different types of travelers has been difficult. More rigorous research involving wider geographical areas is perhaps necessary before more conclusive inferences can be drawn. Apart from the different price sensitivities, as the amount of rooms booked by transient and group guests are generally quite different, the resulting global taxes paid vary substantially; thus, different effects of taxes on lodging demand should be expected for these two types of market segments.

Third, even when this type of data has been available, it has only been used for either a single destination or for relatively few destinations (for instance, Mak and Nishimura 1979; Bonham and Gangnes 1996; do Valle et al. 2012;

Mills, Rosentraub, and Jakar 2019). Although these studies undoubtedly offer an in-depth understanding of lodging tax–related implications for the destinations under study, it is somewhat uncertain whether the conclusions made in these studies would also apply across other destinations. One suspects, however, that because the composition of hotel guests varies considerably across destinations, researchers have been restricted in the extent to which they have been able to draw generalizations based on their findings from a small number of destinations.

Fourth, taxation is only one of the variables affecting the prices faced by consumers, making empirical analyses seeking to estimate elasticity particularly difficult. Issues such as inflation, changes in competitive conditions, changes in labor rates, etc. are only some of the many factors that can affect the cost of doing business, and, therefore, also affect room rates. C. G. Lee (2011) indeed finds that economic conditions are an important determinant of fluctuations in room rates. Controlling for economic conditions is often beyond the scope of most studies in this body of work.

Fifth, the observation that room rates are not the sole determinant of demand, adds a further layer of complexity to research in this domain. Other factors, such as the general economic conditions of a region, also impact travel behavior and therefore affect the demand for lodging. There is evidence that during economic downturns, hotel performance metrics, including occupancy rates and revenue per available room, are affected (Chen 2010; Kosová and Enz 2012; Zheng 2014). These factors can vary across destinations and, therefore, present considerable hurdles to effectively isolating the effects a tax increase from other confounding determinants of demand.

It is possible that the issues outlined above might explain the conflicting nature of results in this scholarship. While some studies argue that lodging taxes are indeed an efficient revenue source for a region and do not disrupt visitor numbers, other studies conclude that the negative effects of taxes are substantial. More research is perhaps needed using more comprehensive data both in terms of geographic scope and with regard to these other factors. The present study advances the literature at least somewhat in this regard.

Research Objective

A critical gap in the literature is an ex post research examining a large, diverse set of destinations to develop a more generalizable understanding of the effects of lodging taxes. The analyses in this article were conducted using an extensive data set created by merging two independent sets of data—tax rate data for 150 urban destinations from HVS and hotel performance data from STR.

Furthermore, unlike much of existing research in which the potential effects of differences in the customer base are not considered, these data allow analyses that recognize differences in key customer types. The hotel market is

commonly segmented into three major segments: transients, group, and contract. Transient and group business comprise the vast majority of hotel business, 71.2 percent and 24.4 percent in 2019, respectively (STR 2020). To presume that the effects of lodging taxes are the same for these primary markets is to assume that transient and group guests have both similar decision-making capabilities and processes and consider similar choice sets. Neither of these assumptions seems viable. There is substantial evidence that group business customers are more rational, more experienced, and reflect a more informed and deeper consideration of alternatives (Crouch and Ritchie 1998; Lilien 2016; Crouch, Del Chiappa, and Perdue 2019). Further, many group travel decisions, particularly for meetings, conventions, and trade shows, involve dramatically different choice sets. For most transient travelers, the destination choice typically precedes the lodging choice (Perdue and Meng 2006). As a result, the transient lodging choice set is generally constrained to lodging accommodations within the destination all of which have the same tax structure. By comparison, group business, particularly for meetings, conventions, and trade shows, involves the simultaneous consideration of destinations and lodging as group decision makers consider host bids from alternative cities/properties (Crouch, Del Chiappa, and Perdue 2019); their choice set is very likely alternative destinations with varying tax structures. Given the more informed and experienced decision making, the greater competition, and the greater availability of substitute lodging with different tax structures, it is reasonable to expect that group accommodation decisions are more elastic and, as a result, more sensitive to lodging taxes.

Hypothesis 1: Lodging taxes have a more negative effect on hotel performance (as reflected in Revenue Per Available Room) for group bookings than for transient bookings.

Formally, transient rooms are defined as those that are sold to individuals and groups of fewer than 10 rooms, while group rooms are those that are sold to groups involving 10 or more rooms. There are several reasons why we expect groups to be more sensitive to price increases than transient travelers. One, group bookings are typically made for conferences and large events. Because groups usually have some flexibility in terms of where these events could be hosted, changes in prices at a destination have the potential to result in groups choosing other host destinations. Two, because group bookings are made in bulk, hotels are more likely to offer attractive discounts to group customers to compensate for the tax increases, thereby absorbing some of the tax increases. Third, one expects that group rooms result from negotiations by professional event planners who are experienced in large event planning and destination selection. Indeed, a study by Crouch, Del Chiappa, and Perdue (2019) suggest that as event planners become more

experienced, they become increasingly concerned with a wider set of attributes, including costs, in the destination selection process. In contrast, one might expect that transient travelers are less experienced in the purchase of accommodations, and hotels are, therefore, more likely to pass on the burden of the tax to them.

Method

In order to estimate the effects of taxes on RevPar (revenue per available room) for transient customers and groups, a system of equations is proposed. As room allocations for transient and groups are interdependent, potential correlations may exist in the error terms across equations; thus, a system of simultaneous equations was used to capture this feature. Accordingly, the RevPar metrics for transient (Tr) and groups (G) for period t are proposed to be explained through the following equations:

$$\begin{aligned} RevPar_{Tr,t} &= \alpha_{Tr} + \beta_{Tr} TaxVar_{t-1} + \gamma_{Tr,1} CIV_t \\ &\quad + \gamma_{Tr,2} RSV_t + \gamma_{Tr,3} GDV_t + \varepsilon_{Tr,t} \\ RevPar_{G,t} &= \alpha_G + \beta_G TaxVar_t + \gamma_{G,1} CIV_t \\ &\quad + \gamma_{G,2} RSV_t + \gamma_{G,3} TDV_t + \varepsilon_{G,t} \end{aligned}$$

where $TaxVar_t$ is the tax variation between years t and $t - 1$, and β represents the effect of $TaxVar_t$ on $RevPar_t$. Subscripts Tr and G determine the segment—transient and groups—analyzed. CIV_t is the coincident index variation, RSV_t is the rooms supply variation, and TDV_t and GDV_t are the demand variations for transient and groups, respectively. The parameters γ_1 , γ_2 , and γ_3 reflect the effects of these variables on $RevPar_t$. The constant is represented by α and the error term by ε_t . Full-information maximum likelihood is used to estimate the parameters.

Sample and Variables

The data set used in this study is constructed using data from two sources. Tax rates for 150 of the largest US cities were first obtained from the annual Lodging Reports prepared by Hospitality Valuation Services (HVS) for each of the years 2013–2018. Those are the years where data are available, which makes this longitudinal database quite unique. HVS reports the highest applicable rate within a city—a rate that in general would be applicable to hotels in the Central Business District (CBD), city center, or airport areas of cities. Each HVS city was matched to the corresponding Smith Travel Research (STR) submarket(s), and relevant hotel data for those submarkets were obtained from Smith Travel Research (STR). As a result of this matching, the final sample is composed of 104 STR submarkets that results in 7488 observations (104 STR submarkets times 72 months). However, some months were missing for some submarkets, so 379 observations were removed from the analysis. This

process resulted in a total of 7109 observations. Note that the unit of analysis is the STR submarket; while data on individual hotels would permit the examination of each hotel as the unit of analysis and thereby increase precision, it is not viable to obtain differentiated data for transient versus group business for each individual hotel.

The dependent and independent variables used in the system of equations are described next.

Dependent variable. Regarding the dependent variable, $RevPar_t$ is used, which is defined as revenue divided by the number of rooms available in period t .

Independent variables. Concerning the independent variables, the analysis distinguished between the central variable of this study (i.e., taxes) and some control variables that capture different geographical scopes.

Central variable. $TaxVar_t$ was obtained through the difference between tax rates in year t and $t - 1$. As transient customers tend to book later than groups, $TaxVar_t$ was used for transient and $TaxVar_{t-1}$ for groups.

Control variables: A series of control variables were used as independent variables. The purpose was to control the evolution of the market at three different levels, namely, state, city, and segment. This way, from the most general dimension (state level) to the narrowest dimension (segment level), our analysis takes any potential trend in these three levels into consideration: *Coincident index variation_t* (state level): The state coincident indexes—created and provided by the Federal Reserve of Philadelphia (2019)—were generated through a combination of four state-level metrics (non-farm payroll employment, average hours worked in manufacturing by production workers, the unemployment rate, and wage and salary disbursements deflated by the consumer price index) to reflect the current economic situation in a state in one single measure (Crone and Clayton-Matthews 2005). The state coincident index was expected to capture the trend of each state's gross domestic product. Coincident index variation is obtained through the difference between coincident indexes in year t and $t - 1$. *Rooms supply variation_t* (city level): Rooms supply shows the amount of available rooms in a city, obtained from STR. Rooms supply variation is obtained through the difference between rooms supplies in year t and $t - 1$. *Demand variation_t* (segment level): Transient demand and group demand capture the amount of reservations for each segment. Demand variation is obtained from STR and calculated through the difference between demand in year t and $t - 1$. Table 1 shows the descriptive statistics for these variables.

Results

Prior to estimating the system of equations, potential collinearity was analyzed. The variance inflation factors of all

Table 1. Descriptive Statistics.

Variable	Mean/Percentage	Standard Deviation
RevPar _{T_t}	85.12	48.24
RevPar _{T_{t-1}}	82.37	48.06
RevPar _{G_t}	47.08	23.36
RevPar _{G_{t-1}}	46.20	22.78
ADR _{T_t}	189.16	57.50
ADR _{T_{t-1}}	184.04	57.04
ADR _{G_t}	180.02	62.73
ADR _{G_{t-1}}	175.43	61.78
OR _{T_t}	43.01	10.76
OR _{T_{t-1}}	42.66	10.87
OR _{G_t}	26.06	9.34
OR _{G_{t-1}}	26.28	9.39
Demand _{T_t}	88,254	119,740
Demand _{T_{t-1}}	87,212	117,339
Demand _{G_t}	50,208	59,958
Demand _{G_{t-1}}	50,294	59,273
Tax percentage _t	14.25%	
Tax percentage _{t-1}	14.17%	
Tax percentage _{t-2}	14.15%	
Supply _t	174,546	225,665
Supply _{t-1}	174,209	225,152
Coincident index _t	120.58	10.94
Coincident index _{t-1}	115.99	10.45

parameters were below the recommended value of 10 (Neter, Wasserman, and Kutner 1989). Thus, collinearity did not seem to be a concern. Heteroskedasticity was also tested; the Breusch–Pagan test rejects homoskedasticity ($F_4 = 22.4$; $p < 0.01$, for transient and $F_4 = 51.3$; $p < 0.01$ for groups). Therefore, the White heteroskedasticity-consistent standard errors were computed (H. White 1980).

Table 2 presents the parameter estimates for the systems of equations. The central variable, the effect of tax variation on RevPar, was nonsignificant for transient but significant and negative for groups. This result supports the hypothesis that lodging taxes have a more negative effect on hotel performance (as reflected in RevPar) for group bookings than for transient bookings.

The analysis for the control variables found the following. For the transient segment, the coincident index variation was significant and positive, rooms supply variation was significant and negative, and transient demand variation was significant and positive. It seems that the better the state economy (as reflected by the coincident index variation) and the greater the transient demand, the higher the transient RevPar. However, as rooms supply increased (rooms supply variation), the lower the RevPar. For group segments, the coincident index variation was nonsignificant, but rooms supply variation was significant and negative, and group demand variation was significant and positive. As before, the greater the group demand, the better the group RevPar, and

the more rooms available (rooms supply variation), the lower the RevPar.

Robustness Checks and Extensions

This section checks for robustness and extends the results obtained in the general model in four different ways: (1) by including additional control variables related to seasonality (model 1 in Table 3); (2) by using the tax variations in percent changes (model 2 in Table 3); (3) by looking at the overall measures (model 4); and (4) by extending the analysis beyond RevPar to analyze Occupancy Rate (OR) (model A in Table 5) and Average Daily Rate (ADR) (model B in Table 5).

First, controlling for seasonality. As the effect of tax rates on demand can be different depending on the month of the year, it was important to control for the potential month effect; a dummy variable was included in the system of equations to reflect. Model 1 in Table 3 shows the parameter estimates that are consistent after the inclusion of the seasonality variables; that is, the negative effect of taxes on RevPar was greater on group business than transient business.

Second, sensitivity analysis of the definition of the tax variation was conducted. The model in Table 2 includes the tax variation variables through the difference between tax rates in year t and $t - 1$ for transient and through the difference between tax rates in year $t - 1$ and $t - 2$ for groups. However, we need to check whether these results are sensitive to the absolute versus relative measures of tax changes, so that we can confirm these results. Model 2 in Table 3 shows the effect of tax variations expressed in relative terms, that is $(\text{tax rate}_t - \text{tax rate}_{t-1}) / \text{tax rate}_{t-1}$ for transient and $(\text{tax rate}_{t-1} - \text{tax rate}_{t-2}) / \text{tax rate}_{t-2}$ for groups. The results confirm the parameter estimates obtained in Table 2, in line with the hypothesis stated.

Table 4 reflects the results for the analyses of the overall measures. Although the hypothesis was based on the potential differential effect of tax rates on transient versus group segments, it was worthwhile to analyze the overall effect to see whether this distinction is maintained. It would permit an observation of, first, a general effect of tax rates on demand, and second, any indications as to the different patterns found for the transient versus group demand. A regression analysis with a single equation model is conducted, and the results present no significant effect for $\text{Tax variation}_{(\text{year } t) - (\text{year } t-1)}$ and significant and negative effect for $\text{Tax variation}_{(\text{year } t-1) - (\text{year } t-2)}$; these results are in accordance with the parameter estimates obtained previously. Note however that the variable $\text{Tax variation}_{(\text{year } t-1) - (\text{year } t-2)}$ is only marginally significant at 10%; this loss of significance can be expected as the overall measures do not split the potential impact of transient versus group segment.

Next, the analysis extended the results beyond RevPar. As the RevPar metric depends on occupancy rate and ADR

Table 2. Tax Effect on RevPar.

		Parameter	SD
Transient	Tax variation _{(year t)-(year t-1)}	-2.5087	11.8225
	Coincident index variation _{(year t)-(year t-1)}	0.4303 ^a	0.0687
	Rooms supply variation _{(year t)-(year t-1)}	-0.0003 ^a	0.0000
	Transient demand variation _{(year t)-(year t-1)}	0.0003 ^a	0.0000
	Constant	1.3989 ^a	0.3404
	R-squared	0.1629	
	Adjusted R-squared	0.1620	
Group	Tax variation _{(year t-1)-(year t-2)}	-37.274 ^a	13.9525
	Coincident index variation _{(year t)-(year t-1)}	0.0875	0.0831
	Rooms supply variation _{(year t)-(year t-1)}	-0.0001 ^a	0.0000
	Group demand variation _{(year t)-(year t-1)}	0.0005 ^a	0.0000
	Constant	0.8945	0.4182
	R-squared	0.3516	
	Adjusted R-squared	0.3508	

a. $p < 0.01$.**Table 3.** Tax Effect on RevPar: Seasonality and Percent Changes.

		Model 1		Model 2	
		Parameter	SD	Parameter	SD
Transient	Tax variation _{(year t)-(year t-1)}	-2.4996	11.8075	-0.5628	2.7919
	Coincident index variation _{(year t)-(year t-1)}	0.4302 ^a	0.0687	0.5525 ^a	0.0788
	Rooms supply variation _{(year t)-(year t-1)}	-0.0003 ^a	0.0000	-0.0003 ^a	0.0000
	Transient demand variation _{(year t)-(year t-1)}	0.0003 ^a	0.0000	0.0003 ^a	0.0000
	Feb	0.5591	0.5607	0.3715	0.7285
	Mar	1.2434 ^b	0.5603	1.4103	0.6846
	Apr	0.7898	0.5607	0.6741	0.6607
	May	1.1743 ^b	0.5599	1.0995	0.6916
	Jun	1.0531	0.5598	1.1359	0.7271
	Jul	0.5849	0.5599	0.3648	0.7158
	Aug	0.7289	0.5599	0.3347	0.7166
	Sept	0.9493	0.5581	0.9079	0.6959
	Oct	1.2806 ^b	0.5573	1.2489 ^c	0.6675
	Nov	0.6326	0.5569	0.4294	0.7332
	Dec	0.4119	0.5582	0.3274	0.7152
	Constant	0.6162	0.5085	-0.1162	0.6614
	R-squared	0.1651		0.167	
	Adjusted R-squared	0.1618		0.163	
Groups	Tax variation _{(year t-1)-(year t-2)}	-37.221 ^a	13.9386	-5.2507 ^a	1.8191
	Coincident index variation _{(year t)-(year t-1)}	0.0862	0.0830	0.0917	0.0794
	Rooms supply variation _{(year t)-(year t-1)}	-0.0001 ^a	0.0000	-0.0001 ^a	0.0000
	Group demand variation _{(year t)-(year t-1)}	0.0005 ^a	0.0000	0.0005 ^a	0.0000
	Feb	0.3043	0.6785	0.2946	0.7029
	Mar	0.6409	0.6786	0.6493	0.7034
	Apr	0.3905	0.6792	0.3851	0.7149
	May	0.1679	0.6779	0.1642	0.7652
	Jun	-0.1341	0.6779	-0.1300	0.7555
	Jul	-0.3579	0.6780	-0.3690	0.6788
	Aug	0.0023	0.6779	-0.0169	0.7432
	Sept	0.2706	0.6754	0.2689	0.7238

(continued)

Table 3. (continued)

	Model 1		Model 2	
	Parameter	SD	Parameter	SD
Oct	0.5990	0.6749	0.5984	0.7255
Nov	−0.3384	0.6743	−0.3485	0.8099
Dec	−0.5149	0.6763	−0.5203	1.1107
Constant	0.8146	0.6211	0.7941	0.7121
R-squared	0.3530		0.353	
Adjusted R-squared	0.3500		0.349	

a. $p < 0.01$.b. $p < 0.05$.**Table 4. Tax Effect on RevPar: Overall.**

	Parameter	SD
Tax variation _{(year t)–(year t–1)}	−24.7040	21.8840
Tax variation _{(year t–1)–(year t–2)}	−33.5012 ^c	19.1044
Coincident index variation _{(year t)–(year t–1)}	0.4697 ^a	0.1289
Rooms supply variation _{(year t)–(year t–1)}	−0.0005 ^a	0.00003
Group demand variation _{(year t)–(year t–1)}	0.0006 ^a	0.0001
Feb	0.5807	0.9430
Mar	1.8582 ^b	0.9439
Apr	0.9416	0.9522
May	1.0562	0.9443
Jun	0.8462	0.8731
Jul	−0.1716	0.9852
Aug	0.1661	0.9009
Sept	1.0673	0.9672
Oct	1.6773	1.0209
Nov	−0.1231	0.8674
Dec	−0.4454	0.8455
Constant	1.2314	0.8240
R-squared	0.2780	
Adjusted R-squared	0.2745	

a. $p < 0.01$.b. $p < 0.05$.c. $p < 0.10$.

(average daily rate) (remember that RevPar can be obtained by multiplying occupancy rate times ADR), it is expected that tax rates should affect either the occupancy rate or ADR (or both) for those situations in which tax rates affect RevPar. Accordingly, Table 5 shows the effects of tax rates on occupancy (model A) and ADR (model B). This analysis identified the variable that drives the impact on RevPar. Specifically, no effect is found in occupancy and ADR for transient guests (which is expected, as no effect was found for RevPar); nevertheless, a significant effect is observed in group occupancy and a null effect in group ADR. Consequently, the results show that the negative effect of tax rates on group RevPar is driven by the negative impact of tax rates on occupancy. It appears that hotels are not reducing their prices in response to tax increases and, as a result, are

suffering losses in group room demand as groups shift their business to other destinations.

Discussion

This research involved combining two large hotel databases; the HVS tax rate data and the STR hotel performance data. The resulting, unique database allows us to potentially identify differences in the effects of hotel lodging taxes on the two primary hotel customer segments. Considering the two most important market segments for hotels—transient and groups—which together represent 95.6% of a hotel business (STR 2020), different reactions to certain variables should be expected because both segments have distinct decision-making capabilities and processes. In particular, regarding lodging taxes, our results show that lodging taxes have a more negative effect on hotel performance for group bookings than for transient bookings. This result is in line with the greater flexibility of groups in terms of where their events could be hosted; in other words, if there is a change in price as a consequence of an increase in lodging taxes, groups can simply opt for a different destination. Also, the fact that group bookings are made in bulk, in the event of a potential increase in taxes, these groups can ask hotels for some discounts to offset that increment in taxes. Finally, the professional character of the negotiations between groups and hotels is central in this context. Group customers are more rational, more experienced, and reflect a more informed and deeper consideration of alternatives (Lilien 2016; Crouch, Del Chiappa, and Perdue 2019).

These results have been confirmed by controlling for (1) seasonality and found that the effect of tax rates on demand is not affected by the month of the year and (2) for the definition of the tax variation, and found that both absolute versus relative measures of tax changes bring about the same conclusions. Interestingly, given that the RevPar metric is formed by occupancy rate and ADR ($\text{RevPar} = \text{occupancy rate} \times \text{ADR}$), uncovering which component absorbs greater effect can be relevant. Accordingly, we found that the negative effect of tax rates on group RevPar is driven by the negative impact of tax rates on occupancy.

Table 5. Tax Effect on Occupancy and ADR.

		Model A: Occupancy		Model B: ADR	
		Parameter	SD	Parameter	SD
Transient	Tax variation _{(year t)-(year t-1)}	2.9935	4.3907	-2.9123	19.301
	Coincident index variation _{(year t)-(year t-1)}	-0.0336	0.0264	1.1292 ^a	0.1158
	Rooms supply variation _{(year t)-(year t-1)}	-0.0001 ^a	0.0000	0.0000	0.0000
	Transient demand variation _{(year t)-(year t-1)}	0.0002 ^a	0.0000	-0.0002 ^a	0.0000
	Feb	-0.0792	0.2157	0.9137	0.9458
	Mar	0.0214	0.2156	1.0147	0.9451
	Apr	-0.0810	0.2157	1.5376	0.9457
	May	0.0503	0.2154	1.1084	0.9443
	Jun	0.0358	0.2154	0.9122	0.9443
	Jul	-0.0317	0.2154	0.2421	0.9444
	Aug	0.0072	0.2154	0.3916	0.9444
	Sept	-0.0229	0.2147	1.1943	0.9414
	Oct	0.0286	0.2144	1.7596	0.9400
	Nov	0.0172	0.2143	0.6293	0.9394
	Dec	0.0995	0.2147	-0.1839	0.9415
	Constant	0.4724 ^b	0.1955	0.5225	0.8571
	R-squared	0.3432		0.0658	
	Adjusted R-squared	0.3406		0.0621	
Groups	Tax variation _{(year t-1)-(year t-2)}	-15.5156 ^b	6.1876	3.5366	23.280
	Coincident index variation _{(year t)-(year t-1)}	-0.0489	0.0381	0.4759 ^a	0.1430
	Rooms supply variation _{(year t)-(year t-1)}	-0.0001 ^a	0.0000	0.0000	0.0000
	Group demand variation _{(year t)-(year t-1)}	0.0002 ^a	0.0000	0.0001 ^a	0.0000
	Feb	-0.0722	0.3117	0.3247	1.1696
	Mar	0.2242	0.3117	0.5809	1.1695
	Apr	0.0501	0.3120	-0.0715	1.1706
	May	-0.0077	0.3114	0.3145	1.1684
	Jun	-0.1815	0.3114	-0.2547	1.1684
	Jul	-0.3032	0.3114	-0.0901	1.1685
	Aug	0.0123	0.3114	-0.6120	1.1685
	Sept	-0.0443	0.3103	0.7163	1.1642
	Oct	-0.1060	0.3100	0.7081	1.1632
	Nov	-0.1073	0.3097	-1.1236	1.1621
	Dec	0.0989	0.3106	-1.2544	1.1655
	Constant	0.1769	0.2851	2.8634 ^a	1.0698
	R-squared	0.3701		0.0376	
	Adjusted R-squared	0.3672		0.0332	

Note: ADR = average daily rate.

a. $p < 0.01$; b. $p < 0.05$.

Conclusions

The COVID-19 pandemic is dramatically, negatively impacting state and local budgets throughout the USA. As the search for tax revenue intensifies over the next few years, it is reasonable to anticipate that increases in lodging taxes will be considered once the travel industry begins to recover. Understanding the potential effects of lodging tax changes will be extremely important to these tax policy deliberations.

Accordingly, this article has analyzed the impact of lodging taxes on the performance of US hotels; it has

substantively extended the existing research by looking at the effects of lodging taxes on the two primary hotel market segments. The empirical application conducted on a sample of 7,109 observations corresponding to more than a hundred submarkets from 2013 to 2018 finds that lodging taxes have a more negative effective on hotel performance (RevPar) for group bookings than for transient bookings. As groups usually have some flexibility regarding the location of events, they might change destination if a tax increase is observed; in effect reducing occupancy rates. To prevent this consequence, hotels may be more inclined to offer discounts to

groups to absorb some of the tax increase, reducing their ADRs. Both effects seem to lead to a reduction in RevPar for group business. Regarding managerial implications, the result that the effect of taxes depends on the segment (i.e., the effect of taxes on RevPar is negative for group business but not for transient business), means that, in order for public entities to measure the impact of a tax change on a destination, they should take into account the main market segment of that destination and understand the effects of the lodging tax changes not only on hotel lodging spending but also on other spending categories, including restaurants, retail, and entertainment. In fact, when controversial taxes are proposed (e.g., the ecotax), looking at global effects without considering the prevalence of a market segment and the specific effect of taxes on that segment can be misleading.

Although this study used a methodology that overcomes several of the issues that have impacted previous research, it is important to nonetheless acknowledge that there are certain limitations that must be considered. For example, in this article, we do not consider how destinations spend monies raised by lodging taxes. We know, for example, that destinations often invest a portion of the revenues raised from lodging taxes into initiatives that promote tourism (Spengler and Uysal 1989). In the state of Minnesota, for example, 95% of the collected monies are used to fund local conventions and visitor bureaus (Dalton 2019). In other markets—like Chicago—whether the revenues are being reinvested into tourism is questionable (Hudson et al. 2019). While we admit that the extent to which cities reinvest lodging tax revenues collect back into the promotion of tourism may impact any destination level tourism metric, obtaining the necessary data required to control for this is challenging. A second limitation of our study results from the fact that our dataset is constructed by matching tax data from HVS and hotel performance data from STR. Each of these data providers use different geographical units. Although we have made our best attempt to match the geographical units as accurately as possible, we admit that perfect matches are not possible for every single destination. Finally, a third limitation is that we do not have data from the decision makers. With data on the process that decision makers follow to choose a destination and therefore a hotel, we could determine via discrete choice models (such as logit models) the determinant factors, among which the tax rate would be included, are relevant to the decisions made.

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References

- Aguilo, E., A. Riera, and J. Rossello. 2005. "The Short-Term Price Effect of a Tourist Tax through a Dynamic Demand Model: The Case of the Balearic Islands." *Tourism Management* 26: 359–65.
- Anderson, J. 2015. "Did Lodging Tax Increases Hurt Hotels in Birmingham Area Cities?" http://www.al.com/news/birmingham/index.ssf/2015/08/did_lodging_tax_increases_hurt.html (accessed January 3, 2020).
- Arnold, R. A. 2010. *Microeconomics*, 9th ed. Mason, OH: South-Western Cengage Learning.
- Assaf, A., and R. Scuderi. 2020. "COVID-19 and the Recovery of the Tourism Industry." *Tourism Economics* 26 (5): 731–33.
- Bonham, C., E. Fujii, E. Im, and J. Mak. 1992. "The Impact of the Hotel Room Tax: An Interrupted Time Series Approach." *National Tax Journal* 45 (4): 433–41.
- Bonham, C., and B. Gangnes. 1996. "Intervention Analysis with Co-integrated Time Series: The Case of the Hawaii Hotel Rooms Tax." *Applied Economics* 28:1281–93.
- Chen, M. H. 2010. "The Economy, Tourism Growth and Corporate Performance in the Taiwanese Hotel Industry." *Tourism Management* 31 (5): 665–75.
- Combs, J. P., and B. W. Elledge. 1979. "Effects of a Room Tax on Resort Hotel/Motels." *National Tax Journal* 32 (2): 201–7.
- Crone, Theodore M., and Alan Clayton-Matthews. 2005. "Consistent Economic Indexes for the 50 States." *Review of Economics and Statistics* 87:593–603.
- Crouch, G. I., G. Del Chiappa, and R. R. Perdue. 2019. "International Convention Tourism: A Choice Modelling Experiment of Host City Competition." *Tourism Management* 71:530–42.
- Crouch, G. I., and J. R. B. Ritchie. 1998. "Convention Site Selection Research: A Review, Conceptual Model and Propositional Framework." *Journal of Convention and Exhibition Management* 1 (1): 49–69.
- Dalton, P. 2019. "Local Lodging Taxes in Minnesota." Minnesota House Research Department. <https://www.house.leg.state.mn.us/hrd/pubs/lodgetax.pdf>.
- do Valle, P. O., P. Pintassilgo, A. Matias, and F. André. 2012. "Tourist Attitudes towards an Accommodation Tax Earmarked for Environmental Protection: A Survey in the Algarve." *Tourism Management* 33 (6): 1408–16.
- Dwyer, L., and P. Forsyth. 2011. "Methods of Estimating Destination Price Competitiveness: A Case of Horses for Courses?" *Current Issues in Tourism* 14 (8): 751–77.
- Dwyer, L., P. Forsyth, and W. Dwyer. 2010. *Tourism Economics and Policy*. London: Channel View.
- Dwyer, L., P. Forsyth, and P. Rao. 2000. "The Price Competitiveness of Travel and Tourism: A Comparison of 19 Destinations." *Tourism Management* 21 (1): 9–22.
- Federal Reserve of Philadelphia. 2019. "Coincident Indexes." <https://www.philadelphiafed.org/research-and-data/regional-economy/indexes/coincident/> (accessed November 2019).
- Fujii, E., M. Khaled, and J. Mak. 1985. "The Exportability of Hotel Occupancy and Other Tourist Taxes." *National Tax Journal* 169–77.

- Hazinski, T. A., A. Davis, and D. Kremer. 2018. "2018 HVS Lodging Tax Report—USA." <https://www.hvs.com/article/8350-2018-HVS-Lodging-Tax-Report-USA> (accessed July 7, 2020).
- Hiemstra, S. J., and J. A. Ismail. 1990. "Impacts of Room Taxes on the Lodging Industry." *Hospitality Research Journal* 14 (2): 231–41.
- Hiemstra, S. J., and J. A. Ismail. 1992. "Analysis of Room Taxes Levied on the Lodging Industry." *Journal of Travel Research* 31 (1): 42–49.
- Hiemstra, S. J., and J. A. Ismail. 1993. "Incidence of the Impacts of Room Taxes on the Lodging Industry." *Journal of Travel Research* 31 (4): 22–26.
- Hiemstra, S. J., and J. A. Ismail. 2001. "Research Note to 'Incidence of the Impacts of Room Taxes on the Lodging Industry': Revision to the Article Published in the Spring 1992 Issue of the *Journal of Travel Research*." *Journal of Travel Research* 30 (3): 319–20.
- Hirschey, M. 2008. *Fundamentals of Managerial Economics*, 9th ed. Mason, OH: South-Western/Cengage Learning.
- Hudson, S., F. Meng, K. K. F. So, S. Smith, J. Li, and R. Qi. 2019. "The Effect of Lodging Tax Increases on US Destinations." *Tourism Economics*. Published online November 28. doi:10.1177/1354816619890752.
- Jensen, T. C., and S. Wanhill. 2002. "Tourism's Taxing Times: Value Added Tax in Europe and Denmark." *Tourism Management* 23 (1): 67–79.
- Johnson, N., C. Collins, and A. Singham. 2010. "State Tax Changes in Response to the Recession." *Center on Budget and Policy Priorities*, March 9.
- Kosová, R., and C. A. Enz. 2012. "The Terrorist Attacks of 9/11 and the Financial Crisis of 2008: The Impact of External Shocks on US Hotel Performance." *Cornell Hospitality Quarterly* 53 (4): 308–25.
- Lee, C. G. 2011. "The Determinants of Hotel Room Rates: Another Visit with Singapore's Data." *International Journal of Hospitality Management* 30 (3): 756–58.
- Lee, S. K. 2014. "Revisiting the Impact of Bed Tax with Spatial Panel Approach." *International Journal of Hospitality Management* 41:49–55.
- Lilien, G. 2016. "The B2B Knowledge Gap." *International Journal of Research in Marketing* 33 (3): 543–56.
- Lipsey, R. G., and C. Harbury. 1992. *First Principles of Economics*, 2nd ed. Oxford: Oxford University Press.
- Mak, J., and E. Nishimura. 1979. "The Economics of a Hotel Room Tax." *Journal of Travel Research* 17 (4): 2–6.
- McDowell, E. 1993. "Boycotts Affect Travel Industry." *New York Times*. <https://www.nytimes.com/1993/01/04/business/boycotts-affect-travel-industry.html> (accessed July 5, 2020).
- Mills, B. M., M. S. Rosentraub, and G. Jakar. 2019. "Tourist Tax Elasticity in Florida: Spatial Effects of County-Level Room Tax Rate Variation." *Tourism Management Perspectives* 31: 174–83.
- Neter, J., W. Wasserman, and M. H. Kutner. 1989. *Applied Linear Regression Models*, 2nd ed. Homewood: R.D. Irwin.
- Perdue, R., and F. Meng. 2006. "Understanding Choice and Rejection in Destination Consideration Sets." *Tourism Analysis* 11 (6): 337–48.
- Quan, D. C. 2002. "The Price of a Reservation." *Cornell Hotel and Restaurant Administration Quarterly* 43 (3): 77–86.
- Schamel, G. 2012. "Weekend vs. Midweek Stays: Modelling Hotel Room Rates in a Small Market." *International Journal of Hospitality Management* 31 (4): 1113–18.
- Sharma, A., and J. L. Nicolau. 2020. "An Open Market Valuation of the Effects of COVID-19 on the Travel and Tourism Industry." *Annals of Tourism Research* 83. Published online July 4. doi:10.1016/j.annals.2020.102990.
- Song, H., N. Seetaram, and S. Ye. 2019. "The Effect of Tourism Taxation on Tourists' Budget Allocation." *Journal of Destination Marketing & Management* 11:32–39.
- Spengler, J. O., and M. Uysal. 1989. "Considerations in the Hotel Taxation Process." *International Journal of Hospitality Management* 8 (4): 309–16.
- STR (Smith Travel Research). 2020. Trend Report—Country: United States: January 2013 to December 2019.
- White, H. 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica* 48:817–30.
- White, M. C. 2011. "The Steep Price of Visiting." *New York Times*. <http://www.nytimes.com/2011/06/07/business/07taxes.html> (accessed January 12, 2020).
- Zheng, T. 2014. "What Caused the Decrease in RevPAR during the Recession? An ARIMA with Intervention Analysis of Room Supply and Market Demand." *International Journal of Contemporary Hospitality Management* 26 (8): 1225–42.

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