

Taxing the Travelers: A Note on Hotel Tax Incidence

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Abstract

This paper uses state level monthly hotel occupancy and price data to examine the effects of a \$5 per night hotel tax imposed by Georgia in 2015. The results indicate that the tax caused both a decrease in hotel occupancy and a decrease in the net of tax price received by hotels in Georgia, though the latter effect is imprecisely estimated. The implied price elasticity of demand of -0.7 is somewhat larger than previous findings in the literature and suggests that states choosing to adopt hotel taxes do suffer some economic distortions as a result.

1 Introduction

Hotel taxes, sometimes called room taxes or bed taxes, are a common strategy for governments to raise tax revenue. First implemented in resort communities where most hotel occupants were from outside areas, hotel taxes are now commonplace throughout the country.¹ The spread of hotel tax levies beyond resort areas has been attributed to the same political economy dynamic that led to their adoption in resort communities - tax exporting. The notion that hotel taxes will be borne by lodgers from outside the taxing jurisdiction likely carries much appeal among state and local government leaders seeking to avoid angering local voters.

Although hotel taxes are now a common revenue source for state and local governments, they have been relatively little studied. Combs and Elledge (1979) argue that the demand for lodging should be inelastic with respect to price and then perform some back-of-the-envelope calculations about how much revenue a hotel tax might raise in the mountain resort community of Watauga County, North Carolina. Similarly, Mak and Nishimura (1979) examine the potential revenue that could be raised if Hawaii implemented a hotel tax. Fujii et al. (1985) extend the discussion of a putative hotel tax in Hawaii to its incidence and exportability and conclude that such a tax would be mostly, but not fully, shifted to visitors.

Hawaii's 1987 hotel tax is the first to receive ex post consideration. Bonham et al. (1992) and Bonham and Gangnes (1996) find that the tax had a negligible effect on hotel revenues, thereby suggesting demand is highly price inelastic and that the tax is completely shifted to tourists. Based on a survey of hotels across jurisdictions with different hotel tax rates, Hiemstra and Ismail (1993) calculate demand and supply elasticities for the lodging industry and use those elasticities to conclude that \$6 out of every \$7 dollars of lodging taxes are paid by guests.

Because the existing research is now somewhat dated and is focused heavily on resort destinations such as Hawaii, it may not be applicable to current lodging taxes. Hence, this paper analyzes a \$5 per night hotel room levy recently imposed by the state of Georgia to pay for transportation infrastructure improvements (Bluestein, 2015).

¹Forty-seven states subject hotels to state sales or bed taxes (or both). In many states, including the three that do not levy statewide taxes on hotels (Alaska, California, and Nevada), there are also local lodging taxes.

2 Data and Empirical Strategy

To test for the effects of hotel taxes on the hotel market, this paper uses monthly data from 2014-2015 on hotel rooms rented in each state, hotel occupancy rates in each state, and average daily hotel room rates (prices) in each state. With 24 observations for 50 states there are 1,200 observations. The hotel data are obtained from Smith Travel Research Inc., a company that compiles and disseminates data on the lodging industry in the U.S. and many other countries. Descriptive statistics for both Georgia and the full dataset are reported in Table 1.

Table 1: Descriptive Statistics

| | Obs | Mean | Std. Dev | Min | Max |
|--------------------|-------|-----------|-----------|-----------|------------|
| <i>All States</i> | | | | | |
| Rooms | 1,200 | 1,937,285 | 2,219,622 | 139,080 | 13,024,150 |
| Occupancy Rate | 1,200 | 0.62 | 0.11 | 0.33 | 0.89 |
| Average Daily Rate | 1,200 | 107.92 | 31.81 | 70.70 | 287.60 |
| Tax | 1,200 | 0.25 | 0.43 | 0 | 1 |
| Unemp Rate | 1,200 | 5.71 | 0.55 | 5.0 | 6.7 |
| Gas Price | 1,200 | 2.89 | 0.56 | 2.04 | 3.69 |
| <i>Georgia</i> | | | | | |
| Rooms | 24 | 3,407,081 | 320,080 | 2,843,248 | 3,987,111 |
| Occupancy Rate | 24 | 0.63 | 0.06 | 0.52 | 0.73 |
| Average Daily Rate | 24 | 90.08 | 4.70 | 80.76 | 98.83 |

The models to be estimated in both level and semi-log forms can be expressed as:

$$DEP = \beta_0 + \beta_1 Georgia * Tax + \beta_2 Tax + \beta_3 Unemp + \beta_4 Gas + \gamma_1 Month + \gamma_2 StateFE + \epsilon \quad (1)$$

where DEP represents the three dependent variables (number of rooms, occupancy rate, or average daily room rate) used in the different estimations. $Unemp$ is the national unemployment rate; it is obtained from the Bureau of Labor Statistics and is included to control for macroeconomic influences on travel and tourism. Gas is the national average gas price; it is obtained from the Energy Information Agency and is included because gas is a complement to many forms of travel and gas prices fell by about one-third over 2014-2015. $Month$ is a vector of month dummy variables (with January omitted to serve as the reference month) included to control for any seasonality in the hotel market. Likewise, $StateFE$ is a vector of state fixed effects included to control for systematic differences in hotel markets across states. The parsimonious specification implicitly assumes that the state fixed effects capture systematic differences in travel across states and there is little variation in these factors over the 2014-2015 period. While many of the attractions that motivate travel and tourism such as beautiful beaches in Florida and stunning national parks in Montana are time invariant, the assumption that factors influencing tourism (other than the other factors explicitly incorporated in the estimation) do not vary over 2014-2015 clearly does not hold perfectly.

Georgia imposed its \$5 per room tax beginning July 1, 2015 so the variable Tax takes a value of one for last six months of 2015.² Its estimated coefficient reflects any systematic changes across states (perhaps from improved macroeconomic conditions) during the last six months of 2015. The variable of interest is $Georgia * Tax$; its estimated coefficient captures the effect of the tax on room stays, hotel occupancy, and average room rates in Georgia. Since the models include state fixed effects (including one for Georgia), Tax , and $Georgia * Tax$, the estimation framework is a straightforward difference-in-differences approach. Standard errors are clustered by state to control for serial correlation.

²Georgia was the only state that changed its statewide hotel or sales tax during the time period of our study. There were some changes in local sales or hotel taxes, and we are not able to control for these changes.

3 Results

Table 2 contains the estimation results from the levels form of the model, while Table 3 contains the estimation results from the semi-log form of the model. The state fixed effects are included in all regressions, but not reported for brevity.

Table 2: Regression Results: Estimation in Levels

| | Rooms | | Occupancy Rate | | Average Daily Rate | |
|------------|---------|----|----------------|----|--------------------|----|
| GA*Tax | -92,055 | ** | -0.04 | ** | -1.52 | |
| | (4.77) | | (6.74) | | (1.58) | |
| Tax | 10,087 | | -0.01 | | 0.81 | * |
| | (1.31) | | (1.39) | | (2.29) | |
| Unemp Rate | 25,099 | * | 0.01 | | -0.62 | |
| | (2.18) | | (1.63) | | (0.89) | |
| Gas Price | -75,977 | ** | -0.02 | ** | -3.55 | ** |
| | (4.39) | | (3.69) | | (5.81) | |
| February | 71,096 | ** | 0.08 | ** | 3.14 | ** |
| | (5.62) | | (23.60) | | (5.40) | |
| March | 413,287 | ** | 0.13 | ** | 5.83 | ** |
| | (6.62) | | (19.28) | | (6.36) | |
| April | 374,033 | ** | 0.14 | ** | 5.26 | * |
| | (7.37) | | (14.67) | | (2.59) | |
| May | 494,481 | ** | 0.17 | ** | 10.52 | ** |
| | (8.17) | | (16.98) | | (4.12) | |
| June | 596,023 | ** | 0.24 | ** | 15.06 | ** |
| | (8.72) | | (18.21) | | (5.38) | |
| July | 727,802 | ** | 0.27 | ** | 18.15 | ** |
| | (8.53) | | (17.66) | | (6.01) | |
| August | 621,150 | ** | 0.25 | ** | 16.97 | ** |
| | (7.68) | | (13.74) | | (5.40) | |
| September | 412,217 | ** | 0.19 | ** | 11.78 | ** |
| | (6.46) | | (13.68) | | (4.15) | |
| October | 516,242 | ** | 0.19 | ** | 10.59 | ** |
| | (7.89) | | (17.76) | | (4.01) | |
| November | 140,882 | ** | 0.07 | ** | 1.37 | |
| | (4.45) | | (9.86) | | (0.62) | |
| December | -8,434 | | -0.00 | | 0.60 | |
| | (0.38) | | (0.22) | | (0.34) | |
| Constant | 976,223 | ** | 0.45 | ** | 84.58 | ** |
| | (19.17) | | (28.60) | | (25.48) | |
| R^2 | 0.99 | | 0.78 | | 0.89 | |
| N | 1,200 | | 1,200 | | 1,200 | |

Note: Parentheses contain t-statistics. * $p < 0.05$; ** $p < 0.01$

The first column of each table contains the number of hotel rooms rented results. The coefficient on *Georgia*Tax* in Table 2 is statistically significant and indicates that hotel stays in Georgia decreased by about 92,000 per month (approximately 2.7% of the mean number of rooms rented per month) following the imposition of the \$5 per night tax. The semi-log estimates in Table 3 indicate that the number of hotel room night decreased by approximately 7% after the imposition of the tax. Column 2 in each table reports the results of the hotel occupancy rate regression; the results are similar in magnitude and statistical significance to those for the rooms rented regressions. The third column in each table contains the average daily room rate results. The estimated coefficient on *Georgia*Tax* in Table 2 indicates that room rates in Georgia fell by \$1.52, but this coefficient is not statistically different from zero at conventional levels. If the \$5 room tax

caused room rates in Georgia to decrease by \$1.52, then hotel operators were able to pass along only \$3.48 of the tax to travelers. The semi-log estimates reported in Table 3 indicate that hotel room rates fell by about 0.3%, an estimate that is neither economically or statistically significant.

Table 3: Regression Results: Semi-log Estimation

| | Ln(Rooms) | | Ln(Occupancy Rate) | | Ln(Average Daily Rate) | |
|------------|-----------|--|--------------------|--|------------------------|--|
| GA*Tax | -0.069 ** | | -0.056 ** | | -0.003 | |
| | (7.52) | | (6.54) | | (0.43) | |
| Tax | -0.004 | | -0.011 | | 0.006 | |
| | (0.68) | | (1.68) | | (1.88) | |
| Unemp Rate | 0.008 | | 0.009 | | 0.000 | |
| | (1.39) | | (1.48) | | (0.07) | |
| Gas Price | -0.035 ** | | -0.026 ** | | -0.039 ** | |
| | (5.34) | | (3.78) | | (7.05) | |
| February | 0.053 ** | | 0.154 ** | | 0.033 ** | |
| | (7.81) | | (22.56) | | (6.25) | |
| March | 0.244 ** | | 0.237 ** | | 0.061 ** | |
| | (19.47) | | (19.34) | | (7.48) | |
| April | 0.241 ** | | 0.256 ** | | 0.059 ** | |
| | (12.89) | | (14.77) | | (3.34) | |
| May | 0.349 ** | | 0.311 ** | | 0.110 ** | |
| | (15.31) | | (16.58) | | (5.31) | |
| June | 0.432 ** | | 0.422 ** | | 0.150 ** | |
| | (14.62) | | (17.39) | | (6.31) | |
| July | 0.500 ** | | 0.460 ** | | 0.173 ** | |
| | (15.27) | | (17.12) | | (6.62) | |
| August | 0.459 ** | | 0.419 ** | | 0.161 ** | |
| | (12.62) | | (13.94) | | (5.96) | |
| September | 0.354 ** | | 0.348 ** | | 0.119 ** | |
| | (11.28) | | (13.62) | | (5.51) | |
| October | 0.371 ** | | 0.341 ** | | 0.108 ** | |
| | (15.05) | | (17.17) | | (5.50) | |
| November | 0.123 ** | | 0.144 ** | | 0.022 | |
| | (7.87) | | (9.96) | | (1.28) | |
| December | 0.006 | | -0.001 | | 0.001 | |
| | (0.67) | | (0.07) | | (0.07) | |
| Constant | 13.839 ** | | -0.779 ** | | 4.397 ** | |
| | (485.46) | | (29.04) | | (117.73) | |
| R^2 | 0.99 | | 0.79 | | 0.88 | |
| N | 1,200 | | 1,200 | | 1,200 | |

Note: Parentheses contain t-statistics. * $p < 0.05$; ** $p < 0.01$

The results from the number of rooms rented and average daily rate regressions can be used to calculate an (own price) elasticity of demand for hotel rooms. With the quantity of rooms rented decreasing by about 2.7% and the \$3.48 of the tax passed along to consumers amounting to about 3.9% of the mean average daily rate in Georgia, the implied elasticity is -0.7. (The semi-log estimates yield a larger, and arguably implausible, price elasticity of about -1.25.) This estimate is somewhat larger than the elasticity of -0.44 obtained by Hiemstra and Ismail (1993) and considerably larger than the elasticity of -0.13 estimated by Canina and Carvell (2005).

4 Conclusion

This paper analyzes the effect of a \$5 hotel room tax imposed in Georgia in 2015 using monthly hotel occupancy and price data from the 50 states. The results indicate that the tax reduced the number of rooms rented in Georgia by about 92,000 per month and that hotel operators were not able to fully shift the tax to travelers, though the price effect is imprecisely estimated. The implied price elasticity of demand of -0.7 is considerably larger (at least 50%) than previous estimates. With many travelers having the option of altering their plans so that their overnight stays fall in states other than Georgia (unlike travelers to, say, Hawaii), a larger price elasticity of demand estimate than previous research is not surprising. In sum, the results suggest that hotel taxes are not a free lunch from a tax exporting perspective and that they may impose significant burdens on local hotel operators.

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