

THE ECONOMICS OF A HOTEL ROOM TAX

By

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Introduction

Many tourist destination areas impose special taxes on hotel room rentals (i.e., transient accommodations). The Philippines, in contrast, has abolished its hotel room tax recently to promote tourism growth.¹ In recent years a number of individuals and interested parties have attempted to effect legislation which would implement a special (ad valorem) hotel room tax in Hawaii. With visitor arrivals increasing at rates exceeding 10 percent per annum since Statehood (1959), proponents of such a tax see it as a potentially significant source of additional revenue to the State. However, few residents agree on the likely economic effects if such a tax were imposed.² Thus, to date, no hotel room tax legislation in any form has passed the Legislature. In this study the impact of a special hotel room tax on visitor behavior is analyzed and its tax revenue generating potential determined.

*Associate Professor and undergraduate senior, respectively, University of Hawaii. This study was prepared under a grant from the Hawaii State Department of Planning and Economic Development to the Social Sciences Linguistics Institute, University of Hawaii. The authors acknowledge their indebtedness to many of their colleagues for helpful comments on an earlier draft, with special thanks to Burnham Campbell and Moheb Ghali, and also to Daniel B. Suits (Michigan State) and Erik F. Haites (Western Ontario) for their suggestions.

¹ Presidential decree No. 31 waived the hotel room tax for foreign visitors only. This measure was taken in response to a request contained in a letter from the hotel association to President Marcos.

² See, for example, Robert Ebel and James Mak, *Current Issues in Hawaii's Economy* (Honolulu: Crossroads Press, 1974), pp. 13-14; *Hawaii Business* (April, 1977), pp. 16-22; and *Honolulu Advertiser* (March 11, 1977), A-3.

Analytical Framework

In this section an analytical framework is developed which relates the impact of a visitor tax on visitor behavior. The focus of the analysis will be the visitor party rather than the individual visitor, since the former is the relevant decision-making unit. However, by assuming that party size = 1, we may use the terms "visitor party" and "visitor" interchangeably without loss of generality.

Our analysis begins with several simplifying assumptions. First, we assume that there is only one quality vacation sold in Hawaii, and it is sold competitively at price OP . (See Figure 1.) We shall relax this assumption later. Leaving the round trip transportation cost for later consideration (i.e. assuming zero airfare) an individual tourist with demand for length of stay in Hawaii, DD , will choose to stay OL_0 days at price OP . DD possesses conventional qualities; the visitor will choose to stay fewer days at a higher price than at a lower price, all else being equal. Thus, at price OP , the tourist with demand curve DD makes a total outlay of $OPBL_0$ for OL_0 days of vacation in Hawaii. The triangle APB is his consumer surplus.

We now introduce the airfare and make two assumptions about its influence on visitor behavior. First, we assume that the cost of the round trip airfare does not have a significant income effect on the tourist so that the demand curve DD is not shifted by the introduction of the airfare. This assumption may not be realistic in view of the high cost of airfare to Hawaii, but conveniently preserves simplicity in our analysis. We shall take appropriate account of this deficiency in our empirical section by incorporating airfare directly in our model.

Second, and also to preserve simplicity, we assume that the individual tourist does not obtain significant consumption value from the airplane ride itself.³ We can thus treat the outlay for the round trip plane ride as a lump sum tax or an admission fee to an attraction that reduces the visitor's consumer surplus. In Figure 1, we have drawn the round trip airfare as a rectangle with area $PCEG$ representing multiple units of the price of one day's stay in Hawaii, OP . It should be clear from Figure 1 that if the area $ACEF$ exceeds the triangle FGB , then he will not come. At the margin, $ACEF$ equals FGB .

³ Some tourists may indeed obtain positive consumption value from the ride itself, but numerous others may suffer from the many hours confined in an airplane, in addition to the debilitating physical effects of "jet lag."

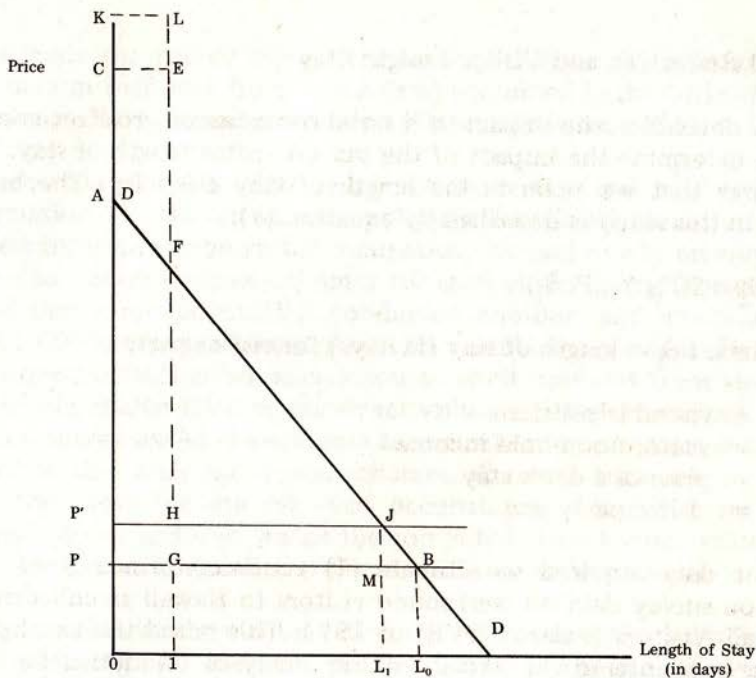


Figure 1

A tax applied on the hotel room rate is also a tax on the price of a day's stay in Hawaii. The incidence of a hotel room tax is an empirical question. For the present, we assume that the entire tax is forward shifted to the tourist so that the price of a day's stay in Hawaii rises by the amount of the tax from OP to OP' . In Figure 1, PP' is the amount of the tax on lodging. The area which represents the round trip airfare is also shifted upward to $P'KLH$ from $PCEG$. With the tax, we now compare the area $AKLF$ with the smaller triangle FHJ to determine if the visitor will come. If $AKLF$ exceeds FHJ , the tourist will not come to Hawaii. Thus, our analysis indicates that with the imposition of a special hotel room tax (that is forward shifted) some tourists who otherwise would have come to Hawaii in the absence of the tax will no longer come, all else remaining constant.

Moreover, depending on the length of stay elasticity, tourists who come to Hawaii in spite of the tax may reduce their lengths of stay. Thus, the tourist with demand curve DD will shorten his stay from OL_0 to OL_1 (Figure 1). As long as DD has some elasticity, then the cost of the tax to the tourist (measured by the area $PP'JB$ in Figure 1) will exceed the income gain to the State ($PP'JM$) by a sum valued by the visitor at JBM .

Hotel Room Tax and Visitor Length Stay

To determine the impact of a hotel room tax on gross revenue we must determine the impact of the tax on visitor length of stay. This requires that we estimate the length of stay elasticity. The model used in this study is described by equation (1):

$$LS_i = f(F_i, Y_i, P, S_i)$$

where LS_i = length of stay (in days) for visitor party i ,

F = round trip airfare

Y = visitor household income

P = price of a day's stay

S = visitor party size

The data required to estimate (1) consisted primarily of cross section survey data on westbound visitors to Hawaii as collected by Hawaii Visitors Bureau (HVB) in 1974. This raised the usual problems encountered in cross section analyses. Nonetheless, they remained the only usable data available.⁴ The data, made available to us on computer tape, consisted of returns of 1669 westbound visitor parties who supplied detailed information in diary form on their daily expenditures, by 12 separate categories, while vacationing in Hawaii. We re-edited the HVB tape so that our working data consist of responses from 690 F.I.T. visitor parties from U.S. mainland. In reducing the sample size, we threw out all incomplete responses, responses from a few foreign visitor parties, as well as those from the remaining few hundred G.I.T. visitors from the U.S. mainland. The responses of the latter were deleted partly because G.I.T. visitors came on prepaid package tours and their lengths of stay were institutionally determined and also because we considered their expenditure estimates to be less reliable since the HVB personnel had to assign imputed values to individual expenditure items included in the prepaid packages.

In addition to data on visitor expenditures, the HVB survey also contained information on the visitor's length of stay, party size, as well as information on the respondent's occupation by several predetermined categories, and place (State) of residence. We were able

⁴ We also tried using time series data, but the results were disappointing partly due to poor data quality, and partly due to serious multi-collinearity.

to estimate the round trip airfare for each visitor party from fare information (off-peak hour coach fare) contained in the *Official Airline Guide*, North American Edition (December issue, 1974).

Unfortunately, the HVB expenditure survey did not ask for information on visitor income, although (as noted earlier) it did request information on visitor occupation. We had to rely on another source to obtain income estimates for each visitor party. Fortunately, in that same year, HVB conducted another, and much larger (about 6000 responses), survey of U.S. mainland visitors to Hawaii. The object of this other survey was to elicit opinions from visitors that would enable HVB to construct visitor satisfaction ratings. The opinion survey asked respondents to indicate not only their occupations but also their household incomes. We were thus able to estimate the mean income for each occupational category from the opinion survey and then assign the computed mean income values to the respective visitor parties in the expenditure survey sample.

It remains necessary to operationally define the price variable, P. We tried using two different proxies for P; one being the average daily expenditure per person on lodging (P_h) and the other being the average daily expenditure per person on all items (P_a). Information on both is contained in the expenditure survey although neither is a "price" in the strict sense — i.e., price per constant quality unit. In a competitive market, "price" is also a proxy measure for "quality." In his study, we were unable to separate "price" from "quality" in an entirely satisfactory manner. Between the two, however, we suggest that P_h is a preferred proxy for "price" than P_a , because "quantity" is less ambiguously defined in P_h than in P_a .

We estimated equation (1) in log-log form by ordinary least squares (OLS) regression technique. The results, with t-values in (), are as follows:

$$\ln LS = 3.396 - .121 \ln F - .027 \ln Y - .045 \ln P_h + .080 \ln S \quad (2)$$

$$(-2.667) \quad (-.678) \quad (-2.185) \quad (2.174)$$

$$R^2 = .023 \quad F(4,690) = 4.982$$

$$\ln LS = 3.445 - .125 \ln F - .029 \ln Y - .031 \ln P_a + .079 \ln S \quad (3)$$

$$(-2.737) \quad (-.720) \quad (-.946) \quad (2.077)$$

$$R^2 = .017 \quad F(4,690) = 3.991$$

In both of the estimated equations, the coefficients of P have the expected signs. However, the coefficient of P_a is not significantly different from zero. The coefficient of P_h is significant in (2). Equation (2) indicates that for a one percent rise in the price of lodging, visitor length of stay would decline by less than five-hundredths of one percent, all else remaining constant. The estimated elasticity is surprisingly low when we consider that the range of P_h over which we estimated DD was between \$0 and \$72 per person per day. When we re-estimated Equation (2), after removing from our sample all those visitor parties who stayed either with friends or with relatives, or who incurred no lodging expenses,⁵ we could not reject the hypothesis that the coefficient of P_h is not significantly different from zero at conventional levels of acceptance.

One concern remains. The insensitivity of visitor length of stay to price changes, indicated by the above results, could stem from our failure to include the amount of vacation time available to tourists. Visitors are subject to time constraints as well as budget constraints. Unfortunately, the HVB expenditure survey did not ask respondents to indicate the number of vacation days available. A casual examination of the frequency distribution of visitor lengths of stay reveals that the frequencies exhibit a bimodal distribution, the modes being 8 and 15 days. They suggest that people who stay eight days or less have roughly one week vacation time, while those who stay between 8 and 15 days have two weeks vacation time, and so forth.

To adjust for differences in the available vacation time, we repartitioned our entire sample into two subsamples: those who stayed less than 9 days, and those who stayed 9 days or longer. We then re-estimated equation (1), using data from the two subsamples separately. The results (not reported here) are similar to those obtained earlier from the unpartitioned sample. Thus, we concluded that (marginal) changes in the price of stay had no impact on the length of stay. In sum, demand for vacation days in Hawaii was as illustrated in Figure 2.

Hotel Room Tax and Trip Demand

The imposition of the hotel room tax may have had an effect on visitor arrivals, i.e., some tourists who otherwise would have come to

⁵The minimum was raised only slightly to \$1.40 per person per day for lodging; the maximum (\$72) was unchanged.

Hawaii might not come any longer. In this section we will attempt to determine the impact of a hotel room tax on visitor arrivals.

Available data do not allow us to directly estimate the elasticity of trip demand with respect to the price of a day's stay. Thus, we can only resort to an indirect method.

With respect to the decision to come or not come to Hawaii, our model implies that a tourist would be indifferent with regards to paying an extra dollar to get here (i.e., airfare) or paying an extra dollar for the same vacation while here. Hence, it is possible to estimate the impact of a hotel room tax on visitor arrivals in two steps. The first is to calculate the cost of the added tax to the tourist as a proportion of the round trip airfare. And the next is to multiply the result by the trip demand elasticity (with respect to the *round trip airfare*) in order to determine what percent of tourists would be dissuaded from coming due to the higher price of vacationing in Hawaii.

Price

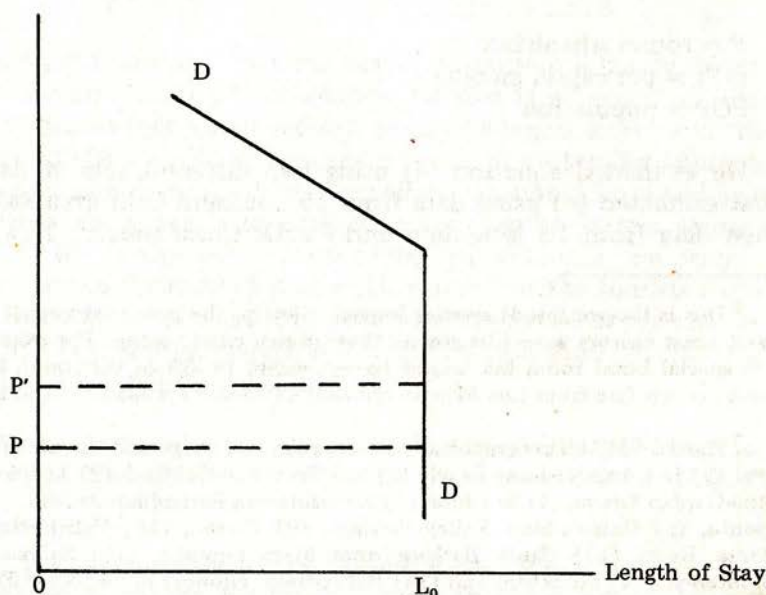


Figure 2

In the preceding section, we have already shown that visitor length of stay is insensitive (i.e. $\epsilon = 0$) to marginal price changes. Thus, assuming (again) that hotel operators can shift the entire tax to

visitors, it is possible to estimate the maximum cost to the tourist due to the special hotel room tax. This can be computed by multiplying the amount of the tax by the initial length of stay; that is $(PP') \times (OL_0)$ in Figure 2. For example, in 1974 the average daily expenditure per U.S. visitor for lodging was approximately \$14 and the average length of stay was 10.7 days. A special hotel room tax of 1% would thus raise the cost of lodging by at most $\$14 \times .01 \times 9.7$ nights = \$1.36 per visitor per trip for those visitors who come to Hawaii in spite of the tax. Since the weighted average round trip (off-peak hour) coach fare between the U.S. mainland and Hawaii in that year was \$376, a one percent hotel room tax that is fully forward shifted represents approximately four-tenths of one percent of the round trip airfare.⁶

To estimate the elasticity of trip demand with respect to the airfare, we used the following model:

$$V_j = g(F_j, PCY_j, POP_j) \quad (4)$$

where V_j = total number of visitors from origin j (1974)

F = round trip airfare

PCY = per capita income

POP = population

We estimated equation (4) using two different sets of data. We first estimated (4) using data from 15 Southern California SMSA's;⁷ then data from 12 Mountain and Pacific Coast states.⁸ This proce-

⁶This is the (weighted) average impact. Clearly, the potential impact on U.S. west coast visitors would be greater than on east coast visitors. For example, the 1% special hotel room tax would be equivalent to .6% of the round trip (off-peak) coach fare from Los Angeles but only .3% from Providence, Rhode Island.

⁷The 15 SMSA's geographically lie between San Diego and Sacramento. They are: (1) Los Angeles-Long Beach, (2) San Francisco-Oakland, (3) Anaheim-Santa Ana-Garden Grove, (4) San Jose, (6) Riverside-San Bernadino-Ontario, (7) Sacramento, (8) Oxnard-Simi Valley-Ventura, (9) Fresno, (10) Vallejo-Napa, (11) Santa Rosa, (12) Santa Barbara-Santa Maria-Lompoc, (13) Salinas-Seaside-Monterey, (14) Stockton, and (15) Bakersfield. Number of visitors (1974) from each of the 15 SMSA's, as well as their respective populations, were obtained from Hawaii Visitors Bureau, "Top 100" Mainland Metropolitan Areas By 1974 Production and Penetration (Honolulu, 1975), mimeo. Per capita income (1973), by SMSA, came from the *Statistical Abstract of the United States* (1975).

⁸The 12 states are: (1) Alaska, (2) California, (3) Oregon, (4) Washington, (5) Arizona, (6) Colorado, (7) Idaho, (8) Montana, (9) Nevada, (10) New Mexico,

ture is preferred to using data from all U.S. mainland states because it enables us to estimate fare elasticities over geographic areas where there are roughly the same substitutes for Hawaii type vacations. Also, we felt that it is desirable to narrow the range of observed airfares over which elasticities are computed. The estimated equations in log-log form, using OLS regression technique, are as follows:

Southern California SMSA's

$$\ln V = -12.598 - .436 \ln F + 2.051 \ln PCY + 1.053 \ln POP \quad (5)$$

$$\quad \quad \quad (-1.839) \quad (2.646) \quad (14.208)$$

$$R^2 = .961 \quad F(3,15) = 114.646$$

Pacific and Mountain States

$$\ln V = -18.665 - .149 \ln F + 3.378 \ln PCY + 1.245 \ln POP \quad (6)$$

$$\quad \quad \quad (-.008) \quad (1.619) \quad (4.813)$$

$$R^2 = .742 \quad F(3,12) = 11.519$$

Equation (5) indicates that the airfare coefficient is barely significant at the 10% level of acceptance. Its sign is as expected. Our finding indicates that a one percent across-the-board increase in the round trip airfare would reduce the number of visitors by approximately .4 of one percent, all else remaining constant. Since adding a one percent room tax is equivalent to four-tenths of one percent increase in the (weighted) average round trip airfare, a one percent room tax would dissuade $.4 \times .4 = .16$ percent of the tourists from coming. In numerical terms, it means that had such a tax been implemented in 1974, approximately 3000 out of a total visitor count of 2 million U.S. visitors would not have come.⁹

Equation (6) indicates even greater visitor insensitivity to marginal fare changes. The estimated coefficient of $\ln F$ is only one-third

(11) Utah, and (12) Wyoming. Data on the total number of visitors from each of the 12 western states were obtained from the HVB *Annual Research Report* (1974). Data on population and per capita income, by state, were obtained from the *Survey of Current Business* (August, 1975).

⁹ Most of the recent room tax proposals have called for a 4% tax. This would be in addition to the 4 percent general excise tax already applied to all retail sales. Thus, a 4 percent special hotel room tax would amount to an 8 percent tax.

that in (5), and not significantly different from zero.¹⁰

Our findings, thus, indicate quite conclusively that a special hotel room tax that marginally raises the cost of vacationing in Hawaii will have a negligible impact on visitor trip demand and on visitor length of stay.

Hotel Room Tax and Nonlodging Expenditures

Thus far, we have assumed that there is only one quality vacation that visitors can buy in Hawaii. Hence, when the price of vacationing in Hawaii is increased, visitors are faced with only two decisions: (1) whether or not to come to Hawaii, and (2) how long shall he/she stay? Clearly, this assumption is unduly restrictive. In fact, at any given time, there are many different qualities of vacation that visitors can buy in Hawaii. If the price of lodging rises as a result of the imposition of a room tax, some visitors may choose to rent lower quality rooms. We are unable to verify this given available data however.

Visitors may also respond to higher hotel room prices by curtailing spending on nonlodging items such as gifts and souvenirs, etc. Indeed, it is precisely this point that has been advanced recently by opponents of hotel room tax legislations.¹¹ Opponents argue that visitors come to Hawaii with tightly fixed budgets. Therefore, every extra dollar spent on lodging due to the room tax would mean one dollar less spent on nonlodging items. Hence, there would be a reduction in private sector income. A tax intended against tourists would, in fact, turn out to be a tax against residents.

In this section, we attempt to determine the impact of hotel price (i.e. lodging expenditure) changes on visitor nonlodging expenditures. The model used is as follows:

¹⁰ Using cross-section data for all U.S. mainland states, Bechdolt computed considerably higher fare elasticities (between -2 and -3) than our estimates. [(See Burley Bechdolt, "Cross-sectional Travel Demand Functions: U.S. Visitors to Hawaii," *Quarterly Review of Economics and Business* (Winter, 1973)]. For reasons given above, we feel that Bechdolt's results are inappropriate for our use. We can only speculate on the reason behind differences in the computed elasticities in Equations (5) and (6). We surmise that the computed fare elasticity is greater for the Southern California SMSA's than for the Pacific and Mountain states because Southern California residents probably have closer substitutes for Hawaii vacations than residents in the entire western states.

¹¹ See, for example, *Hawaii Business*, April, 1977.

$$E_{n1_i} = e(P_h, Y_i, S_i) \quad (7)$$

where E_{n1_i} = per capital daily expenditure on nonlodging items, by visitor i . P_h , Y , and S are as defined above (Section III).

The HVB expenditure survey data, used earlier to estimate visitor length of stay elasticities, were used to estimate (7). However, intuition tells us that we could not use the entire HVB visitor sample at once. Had we done so, we surmise that the coefficient of P_h would turn out to be positive — i.e. as the price of lodging rises, so will expenditure for nonlodging items. In other words, people who spend more on lodging also tend to spend more on nonlodging items. This is not surprising. Some people buy higher quality vacations than others. If the quality of a vacation can be approximated by the dollar amount spent, we should find that those who buy higher quality vacations spend more daily on both lodging and nonlodging items. Because P_h is also a measure of “quality” in our (cross section) study, it would not be surprising to find a positive relationship between P_h and E_{n1} .

To measure the impact of hotel price increases on nonlodging expenditures, it remains necessary to devise a scheme to separate “quality” from “price.” Intuitively, it seems reasonable to assume that people do have at least some vague notions about vacation quality. Most people would likely agree that a person who spends \$100 per day on his Hawaii vacation is buying a higher quality vacation than someone buying a \$20 per day vacation. On the other hand, we also suspect that most people would not likely perceive that a vacation that costs \$100 per day is qualitatively very different from one that costs \$105 or even \$110 per day. In other words, people are less likely to attribute small differences in average daily visitor expenditures to differences in vacation “quality” than large differences in daily expenditures. Quality cannot always be identified easily with precision. Also, search costs are sufficiently high during a short vacation trip^{1 2} such that small differences in expenditures could readily reflect differences in prices paid, even for the same goods and services (i.e. vacation).

We thus tried to separate “quality” differences from “price” changes by arbitrarily partitioning the HVB visitor sample into quin-

^{1 2}That is, the dispersion of prices in visitor destination areas may be sufficiently large.

tiles on the basis of the visitors' average daily expenditures (per capita). In so doing, we in essence assumed that there were only five qualities of vacations sold in Hawaii. We assumed roughly the same quality vacation within each quintile, but not between quintiles. Table 1 presents selected summary statistics for the five quintiles. The first quintile consists of visitors (parties) who spent less than \$30 per person per day; the highest (fifth) quintile consists of those who spent \$60 or more per person per day. As expected, Table 1 shows that visitors who bought higher quality vacations spent more on lodging as well as on nonlodging items.

We then estimated equation (7) using each quintile of observations separately. In so doing, we implicitly assumed that when the price of lodging rises after the imposition of a hotel room tax, visitors will not move from one quintile to another (i.e. to change vacation quality); but they will make some adjustments within their respective quintiles. In other words, people will not perceive the small increase in the cost of lodging to change greatly the overall quality of the vacations they buy. Nonetheless, to the extent that the cost of their vacation has increased, they will likely make some expenditure adjustments and incur a welfare loss at the same time.

We estimated all five equations *linearly* using the OLS regression technique. The estimated regression equations are presented in Table 2.

Table 2 shows that the signs of all the estimated coefficients of P_1 are negative. All the coefficients are significantly less than one; and with one exception, all are significantly greater than zero. These results suggest that, all else being equal, visitors apparently consider lodging and nonlodging expenditures as partial substitutes. Lodging price increases have relatively small or negligible impact on nonlodging expenditures for visitors in the first and fifth quintiles. For the middle three quintiles, our results indicate that for every dollar increase in lodging prices (expenditures), nonlodging expenditures will decrease by 80 to 90 cents.

The results of our study thus seem to indicate that visitors respond to marginal increases in the price of lodging partly by reducing some of their nonlodging expenditures¹³ and partly by reducing their savings and/or spending at home.

¹³We do not know which nonlodging expenditures will be reduced. One suspects that the impact would be the least on items that visitors consider

Table 1
Selected Summary Statistics of the Five Visitor Quintiles

Quintile	Daily Expenditure Range Per Person	Average Total Daily Expenditure Per Person	Average Daily Lodging Expenditure Per Person	Average Daily Non-lodging Expenditure Per Person	Household Income	Party Size	n
1st	< \$30	\$22.70	\$ 7.41	\$15.29	\$14,709	2.38	146
2nd	\$30 - \$37.99	33.91	11.32	22.59	14,795	2.23	132
3rd	\$38 - \$46.99	42.16	13.67	28.49	16,250	2.02	153
4th	\$47 - \$59.99	52.72	16.28	36.44	17,195	1.94	127
5th	> \$60	78.78	21.53	57.25	16,989	1.81	132

Note: n = number of observations

Table 2
Estimated Regression Equations on Visitor Nonlodging Expenditures

Quintile	Constant	P_h	Y	S	\bar{R}^2	F
1st	16.76342	-.25271 (-2.73318)	.00015 (1.87500)	-.77663 (-2.44785)	.087	5.598
2nd	33.27690	-.90624 (-18.09946)	.00002 (.50000)	-.30686 (-1.43072)	.718	84.301
3rd	39.88312	-.78283 (-16.11424)	-.00001 (-.25000)	-.24792 (-.89315)	.629	86.821
4th	52.12349	-.89540 (-14.78778)	-.00003 (-.42857)	-.34381 (-1.844763)	.633	73.345
5th	60.08635	-.15269 (-.91810)	.00037 (1.08824)	-3.19910 (-1.37842)	.002	1.069

Note: Dependent variable is E_{n1} .

Hotel Room Tax and Tax Revenue

It is now possible to estimate the direct impact of a special hotel room tax on State and county revenues. No attempt will be made to

essential" and the greatest on items considered "frivolous" or "luxuries." Using the same visitor expenditure survey data, it is possible to determine which expenditures are "necessities" and which are "luxuries" by estimating Engel curves. (See, for example, S.J. Prais and H.S. Houthakker, *The Analysis of Family Budgets* (Cambridge: Cambridge University Press, 1971)). Preliminary results from work in progress suggest that increases in lodging prices have the greatest impact on visitor spending on gifts and souvenirs.

determine the induced effects. To do so would require prior knowledge of how State and county governments intend to spend their additional tax receipts.

In view of the data limitations, our estimates are necessarily crude. Where required we made assumptions which introduced upward biases into our revenue estimates. For the sake of simplicity, our calculations are based on a one percent room tax.

In the preceding sections, we have shown that a hotel room tax, if imposed, will have negligible effects on visitor trip demand and visitor lengths of stay. To determine the impact of the room tax on gross tax revenue, we make the following assumptions: (1) the entire tax is fully forward shifted, and (2) visitors will not change the quality of lodging purchased. We can compute the gross tax receipts from room rentals for 1974 as follows. In 1974, there were approximately 2 million U.S. visitors to Hawaii,¹⁴ each averaging \$14 per person per day for lodging on vacations which averaged 10.7 days. A one percent hotel room tax would have generated $\$14 \times 9.7 \text{ nights} \times 2 \text{ million visitors} \times .01 = \2.7 million in gross tax receipts from room rentals.

To compute net tax receipts, we must deduct from the rental receipts the tax revenue losses due to the reduction in visitor nonlodging expenditures. If we assume that, on average, a \$1 increase in lodging expenditures due to the room tax reduces nonlodging expenditures by 60 cents — i.e. the mean of the coefficients of P_h in Table 2 — then the same visitors would have spent approximately \$1.8 million less on nonlodging expenditures. However, not all of the \$1.8 million would have represented loss of *resident* private sector income. Part of the loss would have been borne by non-residents who supplied goods and services to Hawaii. According to the First Hawaiian Bank, each dollar of visitor expenditures generated 55 cents in direct personal income to Hawaii.¹⁵ Hence, direct private sector income loss would have been $\$1.8 \text{ million} \times .55 = \$990,000$.

Gross revenue loss to State and county governments due to the reduction in nonlodging expenditures was computed as follows:

¹⁴ Hawaii Visitors Bureau, *Annual Research Report*, 1974 (Honolulu, 1976).

¹⁵ First Hawaiian Bank, *The Impact of Exports in Income in Hawaii: 1971* (Honolulu, 1972).

$$\Delta R = (\epsilon_R) \left(\frac{R}{TY} \right) \Delta TY \quad (8)$$

where: ΔR = change in State and county revenues

ϵ_R = revenue elasticity

TY = total personal income.

Data on R and TY were obtained from the Tax Foundation of Hawaii (*Government in Hawaii*, 1976). For 1974, the revenue-income ratio¹⁶ $\left(\frac{R}{TY} \right)$ was .14. The revenue elasticity (ϵ_R) was estimated at 1.3 by regressing $\ln R$ on $\ln TY$ (1960-1974). Thus $\Delta R = 1.3 \times .14 \times \$990,000 = \$180,000$.

Therefore, the net revenue gain from the room tax would have been \$2.7 million — \$.180 million = \$2.520 million. Recall, however, that this is a high estimate. Furthermore, it does not consider the possibility that a few people who otherwise might have come in the absence of the tax may decide not to come after the tax.¹⁷ Finally, our estimate of the net public sector revenue gain must also be weighed against the private sector income loss of \$990,000.

Our crude calculations show that a special hotel room tax can indeed bring in substantial tax revenue to the State but probably at the loss of some private sector income.

Summary

We summarize our findings as follows:

1. A special hotel room tax will have practically no impact on the

¹⁶ Net of federal grants-in-aid.

¹⁷ See Section IV. If the airfare elasticity is as high as — .436 (i.e. estimated for the Southern California SMSA's), then a 1% room tax would also dissuade 1200 U.S. visitors from coming to Hawaii. Then income and revenue losses must be estimated for these visitors. First, it is necessary to identify which visitors would be dissuaded from coming. Available data do not permit such analyses. For the sake of simplicity, let us assume that those who are dissuaded from coming exhibit the same behavior as the "average" tourist from the U.S. mainland. The average visitor spent \$46 per day during a stay that averaged 10.7 days in 1974. We thus estimated the additional losses in income and revenues at \$866,000 and \$158,000 respectively.

number of visitors coming to Hawaii; nor on visitor lengths of stay.

2. A special hotel room tax will reduce visitor nonlodging expenditures, but not dollar-for-dollar. Visitors will react to higher lodging costs partly by reducing their nonlodging expenditures and partly by reducing savings and/or spending at home.
3. A special hotel room tax can bring in substantial tax revenue to the State but at the loss of some private sector income.