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# Effects of Discriminatory Excise Taxes on Car Rentals


Impacts on Minorities, Low Income  
Households, Insurance Costs, and Auto  
Purchases

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## What We Were Asked To Do

We have been asked to evaluate the effects of discriminatory taxes imposed on individuals who rent automobiles. Our focus is on short term rentals rather than long term leases. We describe these taxes as discriminatory because they are not broad based taxes, like the sales tax or the income tax, but rather are narrowly targeted at rental car transactions.

In recent years such discriminatory taxes have become increasingly popular. They are imposed by state and local governments. Their growing appeal seems to arise from a perception that such taxes are paid not by local residents, but rather by out of town visitors. There may also be a perception that such taxes are paid largely by wealthy business travelers whose expenses are being covered by their employers.

As we will show, neither of these perceptions is accurate.

We have been asked to address four specific questions regarding the effects of these taxes:

- Do these taxes fall to a disproportionate extent on minority households?
- Do these taxes fall to a disproportionate extent on low income populations
- Do these taxes raise auto insurance costs, and if so, by how much?
- Do these taxes reduce auto purchases by rental car companies, and if so, by how much?

## Do Discriminatory Taxes Fall to a Disproportionate Extent on Minority Households?

To answer this question we must first measure the relative propensity to rent of minority and non-minority households. In other words, we must consider whether, all else equal, minority households generate more or fewer rentals and rental days than non-minority households. We answer this question through a statistical analysis relating the number of rentals and rental days generated by residents of a zip code area to data on the demographic and socioeconomic makeup of that area, on the level of discriminatory taxes in effect at the rental locations surrounding that area, and other factors. This analysis focuses on rental transactions conducted at Enterprise locations near the where the renter lives and in which the renter pays the cost of the rental out of his own pocket. Details of that analysis and its results are presented in the Appendix. We summarize the relevant findings here.

We distinguish three racial groups: whites, black and members of other races. The “other” category includes individuals of Asian ancestry, native Americans, and members of mixed races. We measure propensity to rent for the latter two groups relative to whites. Our findings are summarized in Table 1.

**Table 1**  
**Relative Propensity to Rent by Race**

<b>Race</b>	<b>Propensity to Rent (Relative to Whites)</b>
Whites	1.00
Blacks	4.10
Other Races	1.75

Source: Calculations based upon results shown in Table A-1.

We find that controlling for other factors (including household income) black neighborhoods generate over four times as many rental transactions as white neighborhoods. Members of other races are approximately 75 percent more likely to rent than whites.<sup>1</sup> There are a variety of potential explanations for these results, including cultural differences, differences in household wealth, differences in auto ownership rates, or differences in the physical characteristics of the neighborhoods within which minority households reside. Regardless of the explanation, the association between the presence of minority households and the level of rental demand is strong and statistically significant. This relationship is also consistent with anecdotal evidence provided by Enterprise personnel.

Given these results, calculation of discriminatory taxes paid by members of minority households is a two-step process. First, we calculate the total discriminatory tax payments made by residents of each zip code area. Second, we apportion those payments among the three racial groups based upon their shares of overall rental car demand.

We calculated discriminatory tax payments on a rental transaction by rental transaction basis. In order to focus in transactions paid by the renter without reimbursement we limited this analysis to transactions of types — retail and “other” (See Appendix for a more detailed discussion of the different transaction types). For each transaction we knew the Enterprise location at which the transaction took place and thus could identify which discriminatory taxes (if any) were in effect

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<sup>1</sup> These results are based upon a statistical analysis of rental days.

at that location. Taking into account the date of the transaction, the date on which the tax went into effect, the form of the tax (*i.e.*, flat fee or percent of base fee), the base rental rate, and what exclusions or caps might have been in effect, we were able to calculate the discriminatory taxes associated with each transaction. We then summed these payments to compute total discriminatory tax payments by zip code area.

We allocated discriminatory taxes paid by residents of a zip code area to racial group based upon their prevalence in the population of that zip code and their propensity to rent as measured by the regression model and shown in Table 1. We thus allocate to blacks and members of other minority groups a share of discriminatory tax payments that appropriately reflects their greater propensity to rent.

Results of these calculations are shown in Table 2, which shows results both at the state level and for the nation as a whole. We find that blacks pay 28 percent of discriminatory taxes paid on retail rentals, and that members of other minority groups pay an additional 16 percent.

To place these results in perspective, Table 3 compares the distribution of discriminatory tax payments by race to the distribution of a number of other relevant measures. In 2008 Blacks made up 12 percent of the population, but accounted for 27 percent of overall retail rental car demand. Because they are somewhat more likely to rent at taxed locations they paid a slightly higher share of discriminatory taxes levied on retail rental transactions. The pattern for members of other minority groups is less striking, but qualitatively similar. They too pay a higher share of discriminatory taxes than their prevalence in the population would suggest.

In absolute terms, in 2008 blacks paid over thirteen million dollars in discriminatory tax payments. Members of other minority groups paid another seven and a half million dollars during that same period.

**Table 2**  
**2008 Discriminatory Tax Payments**  
**Associated with Home-Based Retail Rentals by Race**

STATE	RACE			All Races
	White	Black	Other Race	
ALABAMA	\$13,811	\$15,657	\$1,589	\$31,057
ALASKA	\$166,898	\$35,268	\$59,650	\$261,816
ARIZONA	\$763,132	\$136,196	\$288,992	\$1,188,320
ARKANSAS	\$390,088	\$219,170	\$56,633	\$665,891
CALIFORNIA	\$0	\$0	\$0	\$0
COLORADO	\$102,894	\$24,702	\$33,714	\$161,310
CONNECTICUT	\$363,119	\$116,981	\$77,085	\$557,185
DELAWARE	\$0	\$0	\$0	\$0
DISTRICT OF COLUMBIA	\$51,682	\$105,799	\$19,804	\$177,285
FLORIDA	\$4,756,398	\$2,508,905	\$924,421	\$8,189,724
GEORGIA	\$787,019	\$893,268	\$190,579	\$1,870,866
HAWAII	\$233,290	\$67,665	\$375,346	\$676,301
IDAHO	\$0	\$0	\$0	\$0
ILLINOIS	\$536,260	\$430,306	\$248,996	\$1,215,562
INDIANA	\$164,391	\$112,468	\$23,609	\$300,469
IOWA	\$285,243	\$37,167	\$35,010	\$357,421
KANSAS	\$0	\$0	\$0	\$0
KENTUCKY	\$39,906	\$8,282	\$2,523	\$50,711
LOUISIANA	\$403,565	\$540,011	\$57,631	\$1,001,207
MAINE	\$207,161	\$32,422	\$27,272	\$266,856
MARYLAND	\$791,533	\$1,029,056	\$237,442	\$2,058,032
MASSACHUSETTS	\$191,437	\$49,392	\$55,436	\$296,265
MICHIGAN	\$64,176	\$58,855	\$11,279	\$134,310
MINNESOTA	\$568,373	\$126,748	\$107,779	\$802,900
MISSISSIPPI	\$0	\$0	\$0	\$0
MISSOURI	\$105,426	\$79,741	\$22,253	\$207,420
MONTANA	\$30,365	\$2,256	\$4,909	\$37,529
NEBRASKA	\$54,066	\$13,455	\$8,500	\$76,020
NEVADA	\$773,142	\$260,629	\$350,225	\$1,383,996
NEW HAMPSHIRE	\$378,445	\$27,241	\$38,364	\$444,050
NEW JERSEY	\$3,092,777	\$1,433,934	\$1,072,798	\$5,599,510
NEW MEXICO	\$235,700	\$35,777	\$118,774	\$390,251
NEW YORK	\$2,453,676	\$1,132,530	\$777,078	\$4,363,284
NORTH CAROLINA	\$543,698	\$545,486	\$121,945	\$1,211,129
NORTH DAKOTA	\$0	\$0	\$0	\$0
OHIO	\$10,131	\$16,093	\$2,681	\$28,905
OKLAHOMA	\$0	\$0	\$0	\$0
OREGON	\$379,658	\$73,842	\$111,183	\$564,682
PENNSYLVANIA	\$2,151,028	\$783,625	\$282,735	\$3,217,387
PUERTO RICO	\$0	\$0	\$0	\$0
RHODE ISLAND	\$166,414	\$33,559	\$34,758	\$234,731
SOUTH CAROLINA	\$8,775	\$4,018	\$950	\$13,743
SOUTH DAKOTA	\$0	\$0	\$0	\$0
TENNESSEE	\$41,106	\$57,508	\$6,888	\$105,502
TEXAS	\$1,266,768	\$697,866	\$633,663	\$2,598,297
UTAH	\$567,253	\$35,946	\$130,091	\$733,290
VERMONT	\$0	\$0	\$0	\$0
VIRGINIA	\$1,309,994	\$1,099,495	\$368,767	\$2,778,255
WASHINGTON	\$1,316,280	\$270,880	\$490,743	\$2,077,904
WEST VIRGINIA	\$0	\$0	\$0	\$0
WISCONSIN	\$569,778	\$173,280	\$81,714	\$824,772
WYOMING	\$0	\$0	\$0	\$0
<b>ALL STATES</b>	<b>\$26,334,856</b>	<b>\$13,325,479</b>	<b>\$7,493,811</b>	<b>\$47,154,146</b>
Percent of Total	56%	28%	16%	100%

**Table 3**  
**Distribution of Population, Rental Demand, and**  
**Discriminatory Tax Payments by Race**

	Race		
	White	Black	Other Race
Population	73%	12%	15%
Rental Days	55%	27%	18%
Difference Relative to Population	<b>-17%</b>	<b>14%</b>	<b>3%</b>
Rental Revenues	56%	26%	18%
Difference Relative to Population	<b>-17%</b>	<b>14%</b>	<b>3%</b>
Discriminatory Tax Payments	56%	28%	16%
Difference Relative to Population	<b>-17%</b>	<b>16%</b>	<b>1%</b>

## Do Discriminatory Taxes Fall to a Disproportionate Extent on Low Income Households?

We computed discriminatory tax payments by low income households using the same methodology employed to compute payments by race. The same regression analysis provided estimates of propensity to rent by income category. These estimates are shown in Table 4. They are measure relative to the propensity to rent of households earning less than \$15,000. Although there is some fluctuation as one moves across income categories, propensity to rent generally increases with household income, as one would expect.

**Table 4**  
**Relative Propensity to Rent by Household Income Level**

Income Category	Propensity to Rent (Relative to Whites)
Less than \$15,000	1.00
\$15,000 to \$24,999	1.81
\$25,000 to \$34,999	2.02
\$35,000 to \$49,999	2.04
\$50,000 to \$74,999	3.06
\$75,000 to \$99,999	4.64
\$100,000 to \$149,999	8.34
\$150,000 to \$249,999	30.40
\$250,000 to \$499,999	23.13
\$500,000 or more	5.00

Source: Calculations based upon results shown in Table A-1.

We allocated discriminatory taxes paid by residents of a zip code area to income categories based upon their prevalence in the population of that zip code and their propensity to rent as measured



by the regression model and shown in Table 4. We thus allocate to higher income households a share of discriminatory tax payments that appropriately reflects their greater propensity to rent.

Results of these calculations are shown in Table 5, which shows results both at the state level and for the nation as a whole. Our analysis indicates that lower income households pay a large share of all discriminatory tax payments. Twelve percent of all taxes paid on retail transaction were paid by members of households earning under \$35,000 per year. Eighteen percent were paid by members of households earning under \$50,000 per year.

**Table 5**  
**2008 Discriminatory Tax Payments Associated with Home-Based Retail Rentals**  
**by Household Income Level and State**

STATE	Household Income Category										All Households
	Less than \$15,000	\$15,000 to \$24,999	\$25,000 to \$34,999	\$35,000 to \$49,999	\$50,000 to \$74,999	\$75,000 to \$99,999	\$100,000 to \$149,999	\$150,000 to \$249,999	\$250,000 to \$499,999	\$500,000 or more	
ALABAMA	\$1,927	\$1,650	\$1,841	\$2,489	\$4,427	\$3,241	\$3,836	\$9,592	\$1,992	\$61	\$31,057
ALASKA	\$6,387	\$8,104	\$10,686	\$15,718	\$33,148	\$28,543	\$38,905	\$103,075	\$16,715	\$534	\$261,816
ARIZONA	\$39,748	\$48,494	\$60,559	\$88,142	\$167,176	\$129,403	\$162,988	\$408,146	\$80,772	\$2,886	\$1,188,314
ARKANSAS	\$36,841	\$38,954	\$45,275	\$61,837	\$109,708	\$74,054	\$80,416	\$180,458	\$37,185	\$1,133	\$665,861
CALIFORNIA	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
COLORADO	\$5,506	\$6,234	\$8,331	\$11,913	\$22,348	\$17,423	\$21,367	\$56,376	\$11,396	\$415	\$161,310
CONNECTICUT	\$15,797	\$16,171	\$19,164	\$28,825	\$60,931	\$56,781	\$81,105	\$229,993	\$46,330	\$2,009	\$557,106
DELAWARE	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DISTRICT OF COLUMBIA	\$6,393	\$4,764	\$6,197	\$9,477	\$18,496	\$16,368	\$21,912	\$76,601	\$16,473	\$604	\$177,285
FLORIDA	\$330,703	\$364,619	\$445,777	\$613,370	\$1,158,194	\$868,211	\$1,057,223	\$2,737,712	\$590,933	\$22,925	\$8,189,669
GEORGIA	\$63,277	\$67,890	\$88,597	\$131,976	\$268,786	\$214,387	\$258,710	\$652,693	\$120,436	\$4,115	\$1,870,866
HAWAII	\$16,041	\$17,326	\$23,337	\$35,720	\$74,391	\$67,216	\$97,614	\$297,072	\$46,071	\$1,512	\$676,301
IDAHO	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ILLINOIS	\$50,704	\$42,664	\$50,957	\$76,783	\$149,450	\$123,527	\$163,122	\$462,254	\$92,518	\$3,550	\$1,215,528
INDIANA	\$12,344	\$15,084	\$18,434	\$25,682	\$46,817	\$34,898	\$39,565	\$90,976	\$16,143	\$525	\$300,469
IOWA	\$12,862	\$16,367	\$20,625	\$29,744	\$59,648	\$45,882	\$49,584	\$101,566	\$20,540	\$603	\$357,421
KANSAS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
KENTUCKY	\$2,097	\$2,286	\$2,678	\$3,865	\$7,892	\$6,329	\$7,192	\$15,294	\$3,004	\$73	\$50,711
LOUISIANA	\$63,908	\$57,036	\$61,746	\$81,387	\$147,770	\$112,906	\$128,221	\$288,141	\$58,269	\$1,800	\$1,001,186
MAINE	\$8,894	\$10,200	\$12,751	\$18,486	\$37,921	\$29,776	\$36,372	\$92,105	\$19,568	\$723	\$266,797
MARYLAND	\$45,163	\$45,950	\$61,785	\$98,945	\$220,863	\$211,350	\$304,651	\$927,059	\$137,911	\$4,352	\$2,058,029
MASSACHUSETTS	\$9,272	\$7,965	\$9,335	\$13,987	\$29,770	\$27,224	\$40,086	\$129,595	\$27,815	\$1,215	\$296,265
MICHIGAN	\$7,819	\$7,103	\$7,993	\$10,671	\$20,216	\$15,892	\$18,358	\$39,763	\$6,323	\$172	\$134,310
MINNESOTA	\$18,538	\$23,104	\$30,953	\$48,148	\$106,300	\$95,506	\$124,186	\$299,424	\$54,802	\$1,916	\$802,875
MISSISSIPPI	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
MISSOURI	\$12,014	\$12,111	\$15,221	\$19,669	\$33,491	\$22,816	\$25,128	\$54,308	\$12,266	\$396	\$207,420
MONTANA	\$1,445	\$1,861	\$2,084	\$3,030	\$5,809	\$4,250	\$4,721	\$11,949	\$2,306	\$71	\$37,527
NEBRASKA	\$2,572	\$3,150	\$4,050	\$5,839	\$11,613	\$9,278	\$11,138	\$23,690	\$4,538	\$153	\$67,020
NEVADA	\$39,681	\$49,048	\$66,643	\$103,113	\$216,382	\$161,822	\$198,390	\$461,531	\$84,767	\$2,799	\$1,383,996
NEW HAMPSHIRE	\$10,342	\$12,951	\$16,699	\$26,084	\$59,074	\$51,521	\$66,441	\$170,627	\$29,353	\$958	\$444,050
NEW JERSEY	\$140,890	\$141,245	\$172,002	\$260,713	\$569,355	\$538,848	\$813,804	\$2,499,726	\$446,596	\$16,330	\$5,599,510
NEW MEXICO	\$16,374	\$18,397	\$21,766	\$30,471	\$57,037	\$43,220	\$52,643	\$124,430	\$25,137	\$776	\$390,251
NEW YORK	\$168,492	\$149,134	\$171,349	\$242,942	\$493,113	\$424,553	\$594,709	\$1,765,472	\$339,156	\$14,132	\$4,363,051
NORTH CAROLINA	\$42,340	\$48,062	\$63,173	\$89,839	\$174,699	\$136,084	\$161,795	\$416,763	\$75,925	\$2,450	\$1,211,129
NORTH DAKOTA	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
OHIO	\$3,357	\$2,235	\$2,179	\$2,622	\$4,181	\$2,673	\$2,884	\$7,180	\$1,546	\$47	\$28,905
OKLAHOMA	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
OREGON	\$22,009	\$23,950	\$29,496	\$43,587	\$84,158	\$65,365	\$77,581	\$181,821	\$35,454	\$1,260	\$564,682
PENNSYLVANIA	\$145,480	\$152,686	\$175,885	\$242,305	\$464,459	\$362,899	\$438,992	\$1,029,526	\$198,548	\$6,608	\$3,217,387
PUERTO RICO	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RHODE ISLAND	\$9,564	\$9,306	\$10,147	\$14,457	\$30,328	\$25,767	\$33,315	\$85,819	\$15,421	\$544	\$234,668
SOUTH CAROLINA	\$584	\$706	\$933	\$1,271	\$2,276	\$1,562	\$1,700	\$3,890	\$796	\$24	\$13,743
SOUTH DAKOTA	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TENNESSEE	\$5,254	\$5,193	\$6,350	\$8,832	\$16,267	\$12,260	\$13,435	\$31,284	\$6,422	\$204	\$105,502
TEXAS	\$101,182	\$110,752	\$139,617	\$195,384	\$356,242	\$275,442	\$346,154	\$900,114	\$167,386	\$6,009	\$2,598,283
UTAH	\$19,817	\$28,061	\$37,048	\$59,510	\$119,138	\$92,670	\$106,455	\$229,692	\$39,618	\$1,282	\$733,290
VERMONT	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
VIRGINIA	\$73,865	\$81,817	\$105,929	\$159,915	\$338,766	\$295,553	\$391,116	\$1,137,330	\$187,977	\$5,667	\$2,777,935
WASHINGTON	\$58,562	\$68,638	\$89,881	\$136,159	\$284,034	\$241,167	\$308,330	\$751,429	\$135,008	\$4,556	\$2,077,765
WEST VIRGINIA	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
WISCONSIN	\$30,450	\$35,854	\$44,285	\$64,869	\$133,282	\$105,743	\$118,176	\$246,907	\$43,794	\$1,411	\$824,772
WYOMING	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>ALL STATES</b>	<b>\$1,658,495</b>	<b>\$1,757,124</b>	<b>\$2,161,578</b>	<b>\$3,117,776</b>	<b>\$6,197,959</b>	<b>\$5,052,412</b>	<b>\$6,502,321</b>	<b>\$17,331,384</b>	<b>\$3,257,211</b>	<b>\$116,802</b>	<b>\$47,153,061</b>
Percent of Total	4%	4%	5%	7%	13%	11%	14%	37%	7%	0%	100%
Cumulative Percent	4%	7%	12%	18%	32%	42%	56%	93%	100%	100%	

Table 6 compares the distribution of discriminatory tax payments by household income to the distribution of population. Because lower income households are much less likely to rent than higher income households, their share of discriminatory tax payments is smaller than their share of the population.

**Table 6**  
**Distribution of Population, Rental Car Demand, and Discriminatory Tax Payments**  
**by Household Income Level**

Household Income Category	Less than \$15,000	\$15,000 to \$24,999	\$25,000 to \$34,999	\$35,000 to \$49,999	\$50,000 to \$74,999	\$75,000 to \$99,999	\$100,000 to \$149,999	\$150,000 to \$249,999	\$250,000 to \$499,999	\$500,000 or more
Population	13%	11%	11%	15%	20%	12%	12%	5%	1%	1%
Cumulative	13%	23%	34%	50%	69%	81%	93%	98%	99%	100%
Rental Days	4%	5%	7%	13%	11%	14%	36%	7%	0%	0%
Difference Relative to Population	-9%	-6%	-4%	-2%	-9%	2%	24%	2%	-1%	-1%
Cumulative	4%	9%	16%	29%	40%	53%	89%	96%	96%	96%
Difference Relative to Population	-9%	-15%	-19%	-21%	-30%	-28%	-4%	-2%	-3%	-4%
Discriminatory Tax Payments	4%	4%	5%	7%	13%	11%	14%	37%	7%	0%
Difference Relative to Population	-9%	-7%	-6%	-9%	-6%	-1%	2%	32%	5%	0%
Cumulative	4%	7%	12%	18%	32%	42%	56%	93%	100%	100%
Difference Relative to Population	-9%	-16%	-23%	-31%	-38%	-39%	-37%	-5%	0%	0%

## Do These Taxes Raise Auto Insurance Costs, and If So, By How Much?

The first part of this question asks whether discriminatory taxes raise auto insurance costs. We believe that they do. The mechanism through which these taxes influence insurance costs involves the provision contained in many auto insurance policies for coverage of the costs of replacement transportation when the covered auto is damaged. For policies that contain such provisions the cost of renting a replacement automobile — including the any discriminatory taxes that must be paid on that rental — are part of the total body of costs that must be covered by the insurance premiums charged. When those costs go up — as they do when discriminatory taxes on rental car transactions are imposed — premiums must eventually go up enough to cover the increased costs.

The dynamics of these adjustments are complex. The relationship between premiums and insured losses varies cyclically. When loss reserves are high, the combination of investment earnings and competition between insurers tends to lower premiums. When loss reserves are depleted, insurers raise premiums in order to rebuild reserves.

Quite apart from the dynamics of the adjustment process however, over the long term insurance companies have to charge premiums that cover their losses. If those losses increase as a result of the imposition of discriminatory excise taxes on car rentals, premiums will eventually have to

rise to cover those increased costs. We believe, therefore, that taxes imposed on replacement transportation rentals will be fully passed on in the form of increased premiums.

To quantify the impact of discriminatory taxes on auto premiums we must compute the total taxes levied on replacement transportation auto rentals. We understand from conversations with Enterprise personnel that these rentals appear in the file under the transaction types labeled “insurance” and “body shop.” In computing the taxes associate with such transaction care must be taken to account for exemptions. A number of jurisdictions, apparently in recognition of the fact that such rentals involve predominantly local residents, exclude replacement transportation rentals from taxes they impose. Where such exemptions existed, we accounted for them in computing the total tax bill.

Our results are summarized in Table 7. We estimate that in 2008 Enterprise customers paid almost 55 million dollars in discriminatory excise taxes on replacement transportation rentals paid for by auto insurance. Based upon available estimates of Enterprise’s share of the overall replacement transportation rental market we estimate that industry-wide tax payments on replacement transportation rental amounted in 2008 to some 67 million dollars. To place these figures in perspective, we have calculated that they amounted in 2008 to roughly twelve dollars paid for every auto collision in the country.

**Table 7**  
**2008 Effects of Estimated Excise Taxes on Insurance Costs**

Enterprise Holdings Replacement Transportation Rental Days	85,898,937	[1]
Enterprise Holdings Replacement Transportation Revenue	\$2,410,568,610	[2]
Enterprise Holdings Estimated Excise Taxes Paid for Replacement Transportation	\$54,891,783	[3]
<b>Enterprise Holdings' Excise Taxes as % of Replacement Transportation Cost</b>	<b>2.3%</b>	<b>[4]</b>
EH share of the total replacement transportation market in 2008	82%	[5]
Size of Replacement Transportation market in 2008	\$2,939,717,817	[6]
Industry-wide rental car excise taxes	\$66,941,198	[7]
2008 automobile collisions	5,800,000	[8]
<b>Excise Taxes Paid per Collision</b>	<b>\$11.54</b>	<b>[9]</b>

**Notes:**

[1], [2]: Enterprise Holdings rental transaction data. (Transaction Types "Insurance" and "Body Shop" are included.)

[3]: *The Brattle Group* analysis

[4] = [3] / [2]

[5]: <http://www.worldmarketmedia.com/home/featured-companies/ev-transportation-otcbb-evtp/key-competitors.aspx>, accessed at 2:15pm on Oct 01, 2009.

[6] = [2] x ( 1 / [5] )

[7] = [4] x [6]

[8]: <http://www.caraccidentsinfo.com/Car-Accident-Statistics.html>, accessed at 3:51pm on Oct 01, 2009. Reports US. DOT information.

[9] = [7] / [8]

Based upon information provided by Enterprise on the identities of the carriers covering these replacement rentals, we have also calculated tax payments by insurer. Results of these calculations are shown in Table 8. Not surprisingly, the largest carriers generally bear the largest tax burden. The amounts paid are sometimes substantial — seven and a half million by GEICO, five and a half million by Allstate, and almost four million by Progressive.

**Table 8**  
**2008 Estimated Excise Taxes Paid for Replacement Transportation from Enterprise,**  
**by Insurance Company**

Insurance Company	Est. Excise Taxes Paid	Replacement Transport Cost	Average Excise Tax Rate
[1] STATE FARM	\$7,868,634	\$381,416,275	2.1%
[2] GEICO	\$7,596,999	\$231,939,361	3.3%
[3] ALLSTATE	\$5,548,539	\$227,742,247	2.4%
[4] PROGRESSIVE	\$3,799,676	\$169,562,039	2.2%
[5] USAA	\$2,875,014	\$127,457,406	2.3%
[6] NATIONWIDE	\$2,630,616	\$97,075,593	2.7%
[7] LIBERTY MUTUAL	\$2,356,620	\$75,320,588	3.1%
[8] TRAVELERS	\$1,722,099	\$51,561,275	3.3%
[9] NEW JERSEY MANUF	\$1,439,962	\$12,633,408	11.4%
[10] FARMERS	\$1,293,443	\$87,633,128	1.5%
[11] ERIE	\$1,147,159	\$24,388,129	4.7%
[12] HARTFORD	\$898,797	\$39,297,573	2.3%
[13] AIG	\$878,364	\$35,230,596	2.5%
[14] METLIFE	\$640,026	\$27,114,835	2.4%
[15] ENCOMPASS	\$590,146	\$16,784,557	3.5%
[16] AMERICAN FAMILY	\$565,187	\$33,841,050	1.7%
[17] AAA	\$505,756	\$49,644,678	1.0%
[18] SAFECO	\$438,195	\$36,128,392	1.2%
[19] FARM BUREAU	\$360,887	\$36,488,052	1.0%
[20] HIGH POINT	\$354,284	\$3,112,056	11.4%
[21] AMICA	\$312,876	\$11,962,290	2.6%
[22] GMAC	\$302,016	\$16,354,975	1.8%
[23] HANOVER	\$274,369	\$9,030,512	3.0%
[24] PALISADES	\$230,146	\$2,177,252	10.6%
[25] CHUBB	\$221,892	\$7,023,387	3.2%
[26] SELECTIVE	\$210,945	\$3,344,519	6.3%
[27] MERCURY	\$203,063	\$45,166,516	0.4%
[28] KEMPER	\$190,316	\$8,351,940	2.3%
[29] ESURANCE	\$160,225	\$8,553,104	1.9%
[30] OTHER	\$9,275,534	\$534,232,875	1.7%
TOTAL	\$54,891,783	\$2,410,568,610	2.3%

## Do These Taxes Reduce Auto Purchases By Rental Car Companies, And If So, By How Much?

Discriminatory excise taxes increase the cost to consumers of auto rentals. This increase in cost can be expected to reduce the demand for such rentals, reducing both the number of rentals and the total number of rental days. A certain amount of rental revenue is required to cover the cost of maintaining a vehicle in the rental fleet. It necessarily follows that there is a reduction in

overall rental demand, there will also be a reduction in the size of the rental fleet, and therefore also, in auto purchases by rental companies.<sup>2</sup>

To quantify the effects of discriminatory excise taxes on auto purchases we relied upon a variation of the analysis we conducted to measure propensity to rental by minority groups and by households in different income categories. As in that earlier analysis (and for the same reasons) we focused initially on home-based rentals. In contrast to that earlier analysis, which focused on retail transactions, here we considered all transaction types. We did this in order to arrive at results that permit us to assess tax effects on overall demand, and hence also on the overall rental car fleet. For similar reasons we also conducted an analysis examining all rental transactions, regardless of the proximity or lack of proximity between the rental location and the residence of the renter. This supplemental analysis helps us to understand the implications of extrapolating from our analysis of home-based rentals to the overall rental market.

Detailed results of these analyses are shown in the Appendix.

Our results for home-based rental indicate that a ten percent increase in discriminatory taxes relative to the base rental rate reduces rental demand by approximately 12 percent. When we examine overall rental demand, regardless of the proximity of the rental location to the residence of the renter, we find that demand is much more sensitive to the level of discriminatory taxes. As we have discussed above, we believe the analysis of home-based rental transactions provides a more reliable depiction of the factors driving rental demand, and so we based our conclusions regarding the effects of such taxes on auto purchases on that set of results. The results we obtain when the restriction to home-based transactions is removed indicates that use of the home-based results provides a conservative estimate of auto purchase effects.

Using our estimate of the sensitivity of rental demand to discriminatory taxes, we can compute how much higher demand would be if those taxes were eliminated. We did this by setting taxes to zero at all locations, and recalculating the level of rental demand for all residential zip codes. Results of this calculation are shown in Table 9. We find that removal of discriminatory excise

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<sup>2</sup> We recognize that the auto acquisition process for rental car companies is complex, and that a variety of different factors can influence the timing of decisions either to retire vehicle from the fleet or to purchase batches of new vehicles. Quite apart from these timing questions, however, it remains true that autos will be added to the fleet only if there is enough demand to support them.

taxes would in 2008 have increased Enterprise rental demand by almost 9 million rental days. This would have represented a 4.4 percent increase in overall rental demand.

**Table 9**  
**2008 Effects of Estimated Excise Taxes on Enterprise RAC Auto Purchases**

2008 Enterprise RAC Rental Days	200,864,879	[1]
2008 Lost Rental Days Due to Effect of Rental Excise Taxes	8,832,467	[2]
Percentage Lost Days due to Rental Excise Taxes	4.4%	[3]
2008 Average fleet size	560,246	[4]
<b>Annual loss in Enterprise RAC Auto Purchases</b>	<b>24,635</b>	<b>[5]</b>

**Notes:**

[1]: Enterprise Holdings rental transaction data. (Transaction Types "Insurance" and "Body Shop" are included.)

[2]: *The Brattle Group* analysis

[3] = [2] / [1]

[4]: 09/15/2009 Email from Client, RE: 2008 Fleet Info.

[5] = [3] x [4]

Supporting a level of rental demand that was 4.4 percent higher would have required a rental fleet 4.4 percent larger. As shown in Table 9, in 2008 the Enterprise domestic rental fleet included 560,246 vehicles. In response to a 4.4 percent increase in demand, Enterprise would therefore have had to add 24, 635 vehicles to its fleet.

We have been informed by Enterprise that on average they will keep a vehicle in their fleet for a year. This fact implies that in order to serve the increase in demand that would result from removal of discriminatory excise taxes Enterprise would have to purchase an additional 24,635 vehicles every year. This figure therefore represents the loss in annual auto sales attributable to the imposition of discriminatory excise taxes on car rentals.

## Appendix

### TECHNICAL APPROACH

#### Information We Relied Upon

We have been asked to address the questions described above empirically. In other words, we have been asked to analyze statistically data on rental car demand, discriminatory tax levies, and other factors, and to base our conclusions on what these data show. Thus, while we use the tools of economic analysis in these investigations, our conclusions are based not upon economic theory or opinion, but rather on what careful examination of the data reveals.

#### ERAC Rental Car Data

The rental car demand data for this analysis were provided by Enterprise Holdings, which also provided funding for this research. Specifically, Enterprise provided us with a computer file listing every car rental transaction conducted at one of the U.S. locations in calendar year 2008, the most recent year for which complete data were available.<sup>3</sup> For each transaction this file listed the zip code of residence of the renter, the Enterprise location at which the rental transaction took place, the starting and ending dates of the car rental, the base rental rate, the gross rental rate (including all surcharges and excise taxes), and the nature of the transaction. The file distinguished six categories of transactions. These transaction types are summarized in Table A-1.

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<sup>3</sup> This file included only rental car transactions involving the Enterprise brand.



**Table A-1**  
**Enterprise Holdings Rental Transaction Data Summary**

<b>Type</b>	<b>Name</b>	<b>Description</b>	<b>% of Total Transactions</b>
R	Retail	These transactions originate from retail locations and are paid for by individual customers.	35%
I	Insurance	Transactions that are related to accident claims for replacement transportation. They are either paid for by insurance companies in full or in part, or by individuals (at an insurance company rate) or for reimbursement by and insurance company.	21%
C	Corporate	Transactions that are paid for by corporate institutions (non-accident related)	19%
D	Dealership	These are paid for by auto dealerships. They are primarily related to non-accident claim replacement transportation.	16%
B	Body Shop		2%
O	Other	All other types of transactions	7%

Enterprise also provided a list of all of its rental location. Among the information provided for each rental location were its geographic coordinates and an indication of whether or not the location was associated with an airport. Using these geographic coordinates and information about zip code locations, we were able to compute the approximate distance from the renter’s residence to the Enterprise location at which the rental was made.

### Claritas Socioeconomic Data

Our study also relied upon zip code level demographic data obtained from Claritas. These data described the population of each of the zip code regions in the country as of 2008. They also classified the households in each zip code by race and by household income.<sup>4</sup>

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<sup>4</sup> The Claritas data were available only for residential zip codes. Some valid zip codes may contain no residents because of the makeup of the geographic area to which they apply. Others correspond to no specific geographic area, but rather to buildings or institutions. For example, the U.S. Postal Service assigns six zip codes to the Pentagon.

## Discriminatory Excise Tax Data

Enterprise also provided a nationwide listing of all of the discriminatory taxes aimed at car rentals currently in effect. This listing described the structure of each taxes (*e.g.*, fixed dollar charge per day, percentage of base rental amount, *etc.*), the transactions to which it applied (*e.g.*, all rental transactions, all rental transaction except rentals representing replacement transportation for autos undergoing repair, *etc.*), the political jurisdiction levying the tax (*e.g.*, city, county, state or special authority), and the date on which the tax went into effect.

Careful analysis of the excise tax data allowed us to determine which taxes applied to each of the transactions in the Enterprise dataset. Using information on the effective date for each tax, we were able determine which taxes were in effect in 2008, and for those that took effect during that year, the portion of the year during which the tax was in effect.

## METHODOLOGY

Although the Enterprise rental data did not include the race or income of the customer, we were able to infer these customer attributes indirectly. To do this we turned to the Claritas data, which described the racial composition of the neighborhoods from which Enterprise customers were drawn.

In using the Claritas data we had to address the issue of differences across households in their propensity to rent. If members of all racial groups in a neighborhood were equally likely to rent, one could simply “assign” to each customer the average racial makeup of the zip code area in which he resided. Any discriminatory taxes paid by that customer could be similarly assigned on a proportional basis to the racial groups residing in that zip code area. A similar assumption regarding the relative propensity to rent among households at different income levels would have provided a way to allocate discriminatory tax payments by income level. However, there was no reason to expect the relative propensity to rent to be the same across racial groups or across income levels. Indeed, in the case of income we would expect households at different income levels to exhibit markedly different propensities to rent. Failure to take such differences into account could lead to seriously distorted results.<sup>5</sup> In order to use the Claritas data, therefore,

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<sup>5</sup> If, for example, high income households were much more likely to rent than low income households, the former would account for a much larger fraction of the rental coming out of an area than their share of the population taken by itself would suggest.

we needed to test differences across racial groups and across income categories in the propensity to rent. To the extent that such differences existed, we needed to find a way to measure them.

In order to measure the effects of discriminatory taxes on car purchases by rental companies, we needed to measure the extent to which such taxes suppressed rental car demand. Doing this required more than a simple comparison between areas with such taxes and area without them. Areas with and without taxes might differ in any number of ways. Most notably, they might differ in racial composition, or in income levels. Any differences in rental demand between locations with and without discriminatory taxes will reflect the net effects on rental car demand of differences in taxes and potential differences in other demand factors. To isolate the effects of discriminatory taxes we must control for the effects of these other demand factors.

These various requirements caused us to adopt an approach based on regression analysis, a widely used technique for separating and measuring the individual effects of multiple causal factors. In this study the causal factors of primary interest included the racial makeup of a zip code area, the income distribution of the households in that area, and discriminatory taxes expressed as a percentage of the base rental rate. Our analysis also included a number of other causal factors, including the population density of the zip code area,<sup>6</sup> and the season of the year in which the rental took place. Using regression analysis, we were able to assign appropriate weights to all of these various causal factors. “Appropriate,” in this context, means the set of weights that does the best job of predicting the actual pattern of rental car demand.

Our analysis focused on home-based rentals. Specifically, we focused on rental transactions conducted at non-airport locations that were located within twenty-five miles of the center of the zip code location within which the renter resided.<sup>7</sup> We focus on this subset of transactions in

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<sup>6</sup> Population density is strongly associated with auto ownership rates, and with the availability of other travel options such as buses, cabs or subways. It can thus be expected to influence auto rental demand in a variety of different ways.

<sup>7</sup> We defined this distance threshold based upon examination of the frequency distribution the distances from renter zip code centroids to Enterprise rental locations. There are many transactions for which the distance was less than twenty-five miles. Beyond that distance, the number of transactions tends to drop to a relatively low level. Our understanding based upon conversations with Enterprise personnel is that it is relatively uncommon for a home based renter to travel twenty-five miles to rent a car. We believe that the prevalence of such long-distance home-based transactions in the data is an artifact created by the fact that zip codes sometimes cover a large geographic area, and hence that a renter may be located much closer to the Enterprise location in question than the center of the zip code area.

order to assure that we have a strong set of explanatory variables with which to explain variations in the basic level of rental car demand.

Home based rental transactions account for a large fraction of overall rental car demand. They represent 80 percent of all U.S. Enterprise rental transactions conducted at non-airport transactions.

As we explain below, we conducted sensitivity analyses to assess the effect that focusing on home-based transactions had on our results, and to provide basis for extrapolating our findings to the entire universe of transactions.

The questions we have been asked to address focus on different sets of rental transaction, and as a result we ran multiple regression analyses. In order to evaluate the impact of discriminatory taxes on minority and low income households we needed to focus on the subset of transactions in which the customer pays the cost of the rental. In contrast, to evaluate the impacts on auto purchases we need to consider the entire universe of transactions.

Table A-1 shows the distribution of Enterprise transactions by transaction type. Retail transactions in which the renter pays directly make up 35 percent of the total. The “other” category, in which the renter also pays the cost himself,<sup>8</sup> makes up another 7 percent of the total.

The results of our regression analysis of these renter-pays transactions are shown in Table A-2. The regression models take as their dependents variable the natural logarithm of rentals per capital and rental days per capita.

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<sup>8</sup> We have been informed by Enterprise that this is the case.

**Table A-2  
Regression Results**

<b>Regression Results</b>				
<b>Retail and Other Transactions</b>				
<b>Non Airport Locations</b>				
<b>Home Based Rentals</b>				
Degrees of Freedom	82,367		82,367	
Adjusted R-Squared	31.7%		30.4%	
	<b>Log of Rentals per Capita</b>		<b>Log of Rental Days per Capita</b>	
<b>Dependent Variable</b>				
<b>Independent Variables</b>				
Intercept	-7.4968	-129.3700	-6.2439	-6.2439
<b>Propensity to Rent Relative to Whites</b>				
Blacks	1.2330	66.0900	1.4105	65.6400
Other Races	0.4577	17.9000	0.5591	18.9800
<b>Propensity to Rent Relative to Households Earning Less Than \$15,000 per Year</b>				
Household Income Level:				
\$15,000 to \$24,999	0.2823	1.7800	0.5911	3.2300
\$25,000 to \$34,999	0.4510	3.3700	0.7021	4.5600
\$35,000 to \$49,999	0.4876	4.5600	0.7151	5.8100
\$50,000 to \$74,999	0.9576	10.7200	1.1180	10.8600
\$75,000 to \$99,999	1.2575	10.2400	1.5357	10.8500
\$100,000 to \$149,999	1.5643	13.6100	2.1210	16.0200
\$150,000 to \$249,999	3.4340	23.3600	3.4144	20.1700
\$250,000 to \$499,999	2.9986	7.6800	3.1410	6.9900
\$500,000 or more	0.4491	1.2500	1.6088	3.8900
Other Independent Variables				
Log of Population Density	0.1491	91.6700	0.1706	91.0300
Quarter Indicators				
Q1 relative to Q4	0.0119	1.5700	-0.0299	-3.4300
Q2 relative to Q4	0.1929	25.6000	0.1384	15.9500
Q3 relative to Q4	0.1367	18.1200	0.1086	12.5100
<b>Log of Gross Daily Rental Rate Relative to Rate Net of Discriminatory taxes</b>	<b>-1.9287</b>	<b>-20.9200</b>	<b>-2.7832</b>	<b>-26.2100</b>

Although this table is fairly complex, several points about its contents are worth noting. First, it summarizes an analysis of a very large body of data. The line labeled “degrees of freedom” is

roughly equivalent to the number of data points feeding into the analysis.<sup>9</sup> The data set used in the analysis includes over 80,000 observations, reflecting the rental demand observed in over 20,000 zip codes in each of four quarters. Second, the relatively small set of variables included in the analysis explains a significant amount of the overall variation in rental demand. The line labeled “R-Squared” represents to percentage of overall rental demand that can be explained by the variables included in the analysis. This value is equal to 32 percent for the model focusing on rental transactions, and 30 percent for the analysis focusing on rental days. For a model of this nature these figures reflect a high degree of explanatory power. Finally, the causal effects shown in Table A-2 are measured with a high degree of statistical reliability. The column labeled “T Statistic” contains measures of statistical reliability for each of the coefficients in the regression model. A value of approximately two is generally regarded as representing an acceptable degree of statistical reliability. Most of the T statistics shown in Table A-2 are well in excess of this threshold value, indicating an extremely high degree of reliability.

We classify the population into three racial categories: white, black and “other.” The “other” category consists largely of individuals of Asian ancestry. It also includes Native Americans and individuals of mixed race. These results indicate that, all else equal, black have a significantly greater propensity to rent than whites. Individuals from other races are somewhat less likely to rent.

Our results also indicate that there is a strong relationship between propensity to rent and household income. Not surprisingly, higher income households are generally more likely to rent than lower income households.

These results also indicate that discriminatory taxes significantly reduce rental car demand. Specifically, they imply that a ten percent increase in discriminatory taxes relative to the base rental rate will results in a 19 percent decrease in the number of rentals and a 28 percent decline in the number of rental days. These results have a high degree of statistical reliability.

Because the model takes the natural logarithm of rental demand as the dependent variable we must exponentiate the estimated coefficients for the race and household income variables. Specifically, we calculate the relative propensity to rent by raising “e” (the base of the natural

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<sup>9</sup> Technically, “degrees of freedom” is defined as the difference between the total number of data points used in the analysis, and the number of coefficients whose values the analysis is attempting to estimate. In the analyses summarize din Table 2 seventeen coefficients are being estimated.

numbers — a mathematical constant roughly equal to 2.8) to a power equal to the estimated coefficients. There are no estimated coefficients for whites or for households earning less than \$15,000 per year. The implied coefficients for these demographic categories are zero. Raising “e” to that power, we obtain 1.00, the value shown for the corresponding category in Tables 1 and 4.

In order to calculate the effects of discriminatory taxes on overall rental demand we need to consider their effects on all transactions types. For this purpose we ran a regression analysis of home based rental demand on a dataset that included all home-based rentals involving non-airport rental locations. Results of this analysis are shown in Table A-3. These results are broadly similar to those shown in Table A-2. Overall rental demand is somewhat less sensitive to taxes than retail demand.

**Table A-3**  
**Regression Results**

<b>Regression Results</b>		
<b>All Transaction Types</b>		
<b>Non Airport Locations</b>		
<b>Home Based Rentals</b>		
Degrees of Freedom	88,620	
Adjusted R-Squared	29.2%	
	<b>Log of Rental Days per Capita</b>	
<b>Dependent Variable</b>		
<b>Independent Variables</b>		
Intercept	-4.2250	-74.1800
<b>Propensity to Rent Relative to Whites</b>		
Blacks	1.0884	57.2900
Other Races	-0.0217	-0.8300
<b>Propensity to Rent Relative to Households Earning Less Than \$15,000 per Year</b>		
Household Income Level:		
\$15,000 to \$24,999	0.5958	3.8800
\$25,000 to \$34,999	-0.0368	-0.2800
\$35,000 to \$49,999	0.0988	0.9500
\$50,000 to \$74,999	0.6794	7.8100
\$75,000 to \$99,999	1.0690	8.9000
\$100,000 to \$149,999	2.4530	21.7400
\$150,000 to \$249,999	2.9995	20.9300
\$250,000 to \$499,999	0.9262	2.4900
\$500,000 or more	2.2181	6.2000
Other Independent Variables		
Log of Population Density	0.1469	91.5500
Quarter Indicators		
Q1 relative to Q4	0.0419	5.4600
Q2 relative to Q4	-0.0146	-1.9100
Q3 relative to Q4	-0.0453	-5.9000
<b>Log of Gross Daily Rental Rate Relative to Rate Net of Discriminatory taxes</b>	<b>-1.2066</b>	<b>-15.5800</b>

Table A- 4 shows the results of a regression analysis of all rental transactions conducted at non-airport locations, regardless of the distance between the rental location and the residence of the renter. Once again, these results are broadly similar to those discussed above. The estimated sensitivity of demand to taxes, however, is significantly greater.



**Table A- 4  
Regression Results**

<b>Regression Results</b>		
<b>All Transaction Types</b>		
<b>Non Airport Locations</b>		
<b>Home Based Rentals</b>		
Degrees of Freedom	111,429	
Adjusted R-Squared	31.4%	
	<b>Log of Rental Days per Capita</b>	
<b>Dependent Variable</b>		
<b>Independent Variables</b>		
Intercept	-4.0676	-74.3100
<b>Propensity to Rent Relative to Whites</b>		
Blacks	1.2922	64.4200
Other Races	-0.3628	-15.6900
<b>Propensity to Rent Relative to Households Earning Less Than \$15,000 per Year</b>		
Household Income Level:		
\$15,000 to \$24,999	0.5536	3.9700
\$25,000 to \$34,999	-0.2787	-2.2400
\$35,000 to \$49,999	-0.3168	-3.1600
\$50,000 to \$74,999	0.4645	5.5500
\$75,000 to \$99,999	1.2843	11.1900
\$100,000 to \$149,999	3.2168	29.0100
\$150,000 to \$249,999	2.3817	15.9900
\$250,000 to \$499,999	1.1448	2.9900
\$500,000 or more	2.6284	6.9100
<b>Other Independent Variables</b>		
Log of Population Density	0.1590	112.7200
<b>Quarter Indicators</b>		
Q1 relative to Q4	0.0586	7.5500
Q2 relative to Q4	0.0101	1.3000
Q3 relative to Q4	-0.0148	-1.9000
<b>Log of Gross Daily Rental Rate Relative to Rate Net of Discriminatory taxes</b>	<b>-3.6340</b>	<b>-34.0700</b>

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