

APPENDIX D

STUDY ON THE PROGRESSIVE OR REGRESSIVE NATURE OF HAWAII'S TAXES

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Executive Summary

Hawaii's taxes are regressive when measured against income. Hawaii's biggest source of revenue is the General Excise Tax (GET), which accounted for 38 percent of total revenues from all State and county taxes in fiscal year 2005. The GET is regressive when measured against income, because taxable items are a smaller part of the total budgets of higher-income individuals and because higher-income individuals save a bigger part of their income. The State's second largest tax, the Individual Income Tax, is roughly proportional to income for single individuals and slightly progressive for a family of four. One thing that makes the State's income tax less progressive is that high-income individuals tend to shift more of the burden to the federal government when they deduct their State income taxes on their federal income tax return.

Overall, when measured against income, the rate of the State and local tax burden drops steadily as income rises. It is about 14 or 15 percent (depending on whether the burdens are measured for a single individual or a family of four) for those with annual income of \$25,000 and it is about 10 percent for those with annual income of \$150,000. However, when measured against lifetime income the tax burden is more evenly distributed, dropping by less than half as much over the same income range. The burden of taxes measured against lifetime income is less regressive than the burden measured against current income, because the burden measured against current income ignores the GET that is paid when savings are spent.

Nonresidents (mainly tourists and military personnel stationed in the State) and the federal government shoulder a large part of the burden of Hawaii's taxes. The part of the total burden that is borne by nonresidents or otherwise shifted out of the State was highest for the Estate and Transfer Tax (100 percent was borne by the federal government before it eliminated the credit for state death taxes and Hawaii effectively repealed the tax), second highest for the Transient Accommodations Tax (69 percent is borne by tourists), third highest for the General Excise Tax (38 percent is born by tourists, nonresident military personnel and the federal government), and fourth highest for the county Real Property Taxes (34 percent is borne by nonresident owners and the federal government). Overall, we estimate that 32 percent of the total burden of Hawaii's taxes is borne by nonresidents or is otherwise shifted out of the State. The estimates for tax shifting are in rough agreement with those in previous studies of Hawaii's taxes.

I. Introduction

In this study we try to determine how progressive or regressive are Hawaii's taxes. More exactly, we compare the tax burden for taxpayers with different incomes, where the tax burden is defined as the reduction in disposable income caused by taxes. If the ratio of the tax burden to income increases as income rises, taxes are said to be progressive. If the ratio declines as income

risers, taxes are said to be regressive. If the ratio stays the same as income rises, taxes are proportional. The exercise seems simple, but the results are subject to substantial error and are easy to misinterpret.

The study is organized as follows. The next section identifies the taxes that are considered in the study. Section III describes how we measure the taxpayer's income. Section IV describes how we determine who bears the burden of Hawaii's taxes. Section V describes the taxpayers for whom we estimate tax burdens. Section VI contains our estimates of how the tax burdens are distributed. Section VII compares the results to those of earlier studies and Section VIII contains our conclusions.

II. What Are Taxes?

"Taxes, after all, are dues that we pay for the privileges of membership in an organized society"

- Franklin D. Roosevelt

"A fine is a tax for doing something wrong. A tax is a fine for doing something right"

- Anonymous

A tax is a payment required by the government that is not tied to a direct benefit to the taxpayer. Income taxes and sales taxes are common examples of taxes. User fees, such as green fees to play golf at a municipal golf course, or airport landing fees, usually are not considered to be taxes, because they are tied to a direct benefit to the user: The green fees help pay for maintaining the golf course, and the landing fees help pay for operating the airport. Payments such as contributions to the employment security fund (unemployment insurance) are gray areas. If the contributions are used only to fund unemployment benefits, then they are insurance payments rather than taxes. On the other hand, if they are spent on other government functions, then they can be regarded as taxes. We exclude the contributions, because they appear to be more like payments for insurance than taxes. They are experience-rated, meaning they are based on the employer's past record for employment stability, and the fund is self-supporting.¹ Table 1 lists the taxes included in the study and shows the revenue for each in fiscal year 2005. The Tax Review Commission has asked that local taxes be included in the analysis, so the list includes taxes imposed by the counties, as well as those imposed by the State.

III. How Should We Measure Income?

"There are three kinds of lies: lies, damn lies and statistics."

- Mark Twain

The reason for comparing tax burdens for people with different incomes is to see if taxes are distributed in line with the ability to pay them in a manner deemed fair. A simple measure of money income is not altogether satisfactory for this purpose. For example, money income

¹ The employment security contributions were also excluded in an earlier study by Walter Miklius, James Moncur and PingSun Leung, "Distribution of State and Local Tax Burden by Income Class," report to the Tax Review Commission of 1989.

understates the resources available to people who get public assistance. A better measure of the ability to pay taxes would include in-kind transfers from government (such as Medicare and Medicaid, housing subsidies and food stamps), unreported or illegal income, the imputed rental value of owner-occupied housing, and capital gains as they are accrued (not merely when they are realized). The measure of ability to pay that economists favor is called Haig-Simons income, defined as consumption plus the change in net worth.² Economists at the U.S. Department of Treasury have produced a measure of income, which they call "total income," in an attempt to account for the factors omitted in simple measures of money income.³

Owing to the paucity of resources available for the present study, we do not try to calculate total income. In our opinion, the sacrifice is not great, because such calculations are inexact and often misleading. Allocating unreported income among taxpayers is particularly problematic. Some people have low reported income simply because they don't report all of it, but much of the unreported income belongs to sole proprietors who are in the higher income classes even when their income is underreported. Furthermore, if the purpose of the exercise is to inform the public about relative tax burdens, then using measures of total income is not a good idea. People know their adjusted gross income computed for federal income tax purposes (AGI) and their "expanded income" (AGI plus other items of income that are reported on the federal income tax return even though they are not subject to tax, such as interest on state and local bonds), but many would be surprised to learn the amount of total income that is imputed to them.

Our strategy in the present study is to compare tax burdens of taxpayers at various levels of federal AGI. The main disadvantage of the approach is that it does not allow us to calculate the share of the total tax burden borne by different income classes. For example, we are unable to show the share of the total tax burden that is born by the people with income greater than 90 percent of all taxpayers. On the other hand, our approach avoids some of the problems that arise when taxpayers are assigned to income classes. In such exercises, the taxpayer unit usually is defined as the family and all units with incomes in a given range are lumped together. This means, for example, that a single individual with annual income of \$50,000 is put on a par with a family of four that has the same income.

² Sometimes even this 'ideal' income measure needs to be adjusted. For example, pension income is earned while the worker is employed but is available for consumption only after retirement. Haig-Simons income does not include pension payments, because the payments are matched by a reduction in the taxpayer's net worth as the pension assets are drawn down. If contributions to the pension are not voluntary, it is probably better to include the pension income when it is received, rather than when it is earned.

³ To get total income, they begin with federal adjusted gross income (AGI) and then adjust it as follows. First, add unreported income that arises when people do not file an income tax return, underreport their income, or overstate their deductions; unrealized capital gains (including appreciation of owner-occupied housing), net of depreciation and inflation; deductions for payments to tax deferred retirement plans; income earned in foreign countries that is excluded from U.S. taxable income; health payment deductions of self-employed individuals; fringe benefits provided by the employer (including military benefits); tax-exempt interest; the imputed value of rents on owner-occupied housing, less expenses of homeownership that are not paid directly by renters, such as mortgage payments, property taxes, depreciation, and maintenance and repairs; food stamps, benefits from Medicare and Medicaid, and other transfer payments from the government; and losses carried over from a prior year. Then, subtract costs of earning income that are disallowed as deductions from AGI (such as employee commuting costs); and income carried over from a prior year. For an example of total income calculations, see Julie-Anne Cronin, U.S. Department of Treasury, *OTA Paper 85*, September 1999.

TABLE 1
State and County
Tax Revenues in Fiscal Year 2005

Tax	Revenue <i>(In \$thousands)</i>	Percent of Total
<i>Hawaii State Taxes</i>		
1. General Excise and Use Taxes.....	\$2,136,603	37.7
2. Individual Income Tax.....	1,381,480	24.4
3. Transient Accommodations Tax.....	198,774	3.5
4. Public Service Company Tax.....	108,686	1.9
5. Corporation Income Tax.....	85,605	1.5
6. Tax on Insurance Premiums.....	83,077	1.5
7. Tax on Banks and Other Financial Corporations.....	38,520	0.7
8. Estate and Transfer Tax ^a	12,712	0.2
9. Conveyance Tax.....	24,583	0.4
10. Taxes on Fuel.....	106,521	1.9
11. Tax on Liquor.....	43,737	0.8
12. Taxes on Cigarettes and Tobacco.....	85,245	1.5
13. Motor Vehicle Taxes ^b	<u>100,278</u>	<u>1.8</u>
<i>Total, State Taxes</i>	\$4,405,821	77.8
<i>County Taxes</i>		
1. Real Property Taxes.....	\$968,326	17.1
3. Fuel Tax.....	76,310	1.3
2. Motor Vehicle Weight Tax.....	60,311	1.1
4. Public Utility Franchise Tax.....	41,539	0.7
5. Public Service Company Tax.....	42,506	0.8
6. Licenses and Permits.....	<u>63,930</u>	<u>1.2</u>
<i>Total, County Taxes</i>	\$1,252,922	21.2
<i>Total, State and County Taxes</i>	\$5,658,743	100.0

^a Hawaii's Estate and Transfer Tax has been effectively repealed for decedents dying after December 31, 2004.

^b Includes the State's Motor Vehicle Weight Tax and the surcharge on rental and tour vehicles.

Source: State taxes are from Department of Taxation data files. County taxes are from the Comprehensive Financial Annual Reports for Maui, Kauai, Hawaii and the City and County of Honolulu.

Lumping together single-member and multi-member families in the same income class can be misleading, because lower income classes typically contain more single-member families. For example, in 2003, single taxpayers accounted for 74 percent of Hawaii State income tax returns with AGI of \$20,000 or less, but for only 24 percent of those with AGI of \$40,000 or more. This means that comparing tax burdens of different income classes confounds the effects of changes in income with the effects of changes in family size. We avoid this problem when comparing the burden of the Individual Income Tax and some other taxes but, as explained below, we cannot avoid the problem when comparing burdens of the General Excise Tax.

A problem common to both approaches is that the income classes usually contain people at different stages of their lives. Most people follow a lifetime pattern in which consumption is less than income during their working years (because they save) and exceeds income after they retire.⁴ Income and earnings are lower at the beginning of the worker's career and grow as the worker gains experience and seniority, and starts getting returns from saving. Many people also borrow at the beginning of their careers, to pay for school or to buy consumer durables, and pay off their loans by saving in later years. Thus, differences in tax burdens at different income levels do not always imply differences in lifetime tax burdens of individuals.⁵ For most people lifetime earnings and lifetime consumption are about the same, so a consumption tax is proportional to lifetime income. It is improper to draw conclusions about the equity of a consumption tax based on temporary differences in rates of saving. Another way to describe the problem is that it is improper to look only at the burden of a consumption tax on current expenditures, because savings usually are matched with expenditures that have already been taxed or that will be taxed in future.⁶

IV. Who Bears the burden of a Tax?

*"Taxes are paid in the sweat of every man who labors."
- Franklin D. Roosevelt*

The question of who bears the burden of a tax (sometimes referred to as the incidence of the tax) is an economic question that is entirely different from the question of who bears legal liability for the tax. The person who actually pays the tax to the government often is able to shift the burden of the tax to another. Tax burdens become fragmented, and where they ultimately come to rest usually is hard to determine. For example, the burden of the General Excise Tax usually is presumed fully passed on to the customer if it is included in the bill. To know how much of the burden actually is shifted to the customer, however, we would need to know what the price would have been absent the tax. If the tax causes the business to lower its pretax price, then the business bears part of the burden, even if it adds the full amount of the tax to its bill. The counterfactual cannot be observed, so we can never be certain how the tax burden is distributed. Standard supply and demand analysis tells us, however, that the business generally bears part of the burden.

This study presents estimates for the long-run effects of taxes, which usually are different from immediate effects. To see how tax burdens can be shifted, and the differences between the immediate effects and the effects in the long run, consider as an example what would happen if Hawaii eliminated the Corporation Income Tax. In the short run, current shareholders would

⁴ See the classic study by Albert Ando and Franco Modigliani, "The Life Cycle Hypothesis of Saving: Aggregate Implications and Tests," *American Economic Review*, March 1963, pp. 55-84.

⁵ For more complete discussions of this and similar issues, see R. Glenn Hubbard, James Nunns and William Randolph "Household Income Mobility During the 1980's: A Statistical Assessment Based on Tax Return Data," *Tax Notes*, June 1, 1992; and R. Glenn Hubbard and David F. Bradford "Distributional Analysis of Tax Policy," Washington, D.C.: *AEI Press*, 1995. A study by the Joint Committee on Taxation lays bare many of the shortcomings of the distributional analyses. It concluded "Income categories may be a convenient way of presenting snapshots of income data for a group of people at a certain point in time. Nonetheless, the notion of a quintile as a fixed economic class or social reality is a statistical mirage." See Joint Committee on Taxation, "A Guide to Tax Policy Analysis: Problems with Distributional Tax Tables," United States Congress, January 2000, page 13.

⁶ This issue was also recognized in the Report of the 2001-2003 Tax Review Commission.

benefit most, but to find out who ultimately would benefit we need to know the effects on all prices (including wages and land rents) and corporate profits after all the economic actors have had the chance to fully respond. If we could see these things, we probably would find that the tax raises prices to consumers, that it reduces local land rents, that it reduces earnings of local workers, and that it increases the rate of pretax corporate profit. When the tax reduces pretax incomes of workers and landowners, it also reduces federal individual income taxes.⁷ In short, we would find that the burden of the tax is strewn over consumers, landowners, workers and the federal government.

In the long run, little if any of the tax burden is borne by the shareholders. The conventional economic wisdom holds that in the long run a small taxing jurisdiction, such as a state, cannot export any part of a tax on corporate income to external shareholders. The reason is that the tax causes the investors to demand a higher pretax profit on local investment to compensate for the tax.⁸ Even the local shareholders escape the burden of the tax. The conclusions are based on the simple logic that investors look to get the highest after-tax return they can on their investments and that a single jurisdiction contains only a small part of the available investment opportunities. If something happens to reduce the after-tax rate of return in the local jurisdiction, investors will go away and local investment will suffer until scarcity brings the local after-tax rate of return to new investment back up to the level investors can get elsewhere.

Part of the burden of Hawaii's Corporation Income Tax is exported indirectly, because the tax raises prices for tourists as well as local residents. However, if the corporation's output competes with imports, little of the burden can be passed on to consumers as higher prices. Instead, the burden of the tax is passed back to landowners and local labor. These conclusions are valid, whether or not other jurisdictions tax corporate income. We are looking only at the effect of Hawaii's Corporation Income Tax, holding constant things that would not change automatically with a change in the tax. Unless other jurisdictions respond to a change in Hawaii's taxes, their taxes are irrelevant for the exercise. For the same reason, it does not matter if local producers have a strong price advantage owing to transportation costs.

In most cases, the evidence on tax incidence is weak and leaves ample room for error when calculating tax burdens. The errors can affect the denominator as well as the numerator of the tax burden ratio because, as explained above, taxpayers sometimes bear the burden of a tax as foregone earnings rather than as a payment from income. Ideally, all income should be measured before the effect of taxes, regardless of how the burden is borne. However, we observe only the actual income without foregone earnings, so that is what we use for the denominator of the tax burden ratio. This causes the calculations to overstate the burden ratio for workers who pay taxes implicitly in the form of foregone earnings.

Another source of error in measuring the tax burdens is that the tax-induced reduction in income exceeds the amount of taxes actually collected, because taxes influence peoples' economic decisions (for example, by discouraging them from working) and because people

⁷ Because the required increase in pretax profits is the amount of the State tax, even though this tax is deductible from the federal corporate income tax, the deduction does not reduce in the federal corporate income tax liability. Thus, there is no direct federal offset for the State's Corporation Income Tax.

⁸ In the argot of economists, the supply of capital is perfectly elastic at the externally set rate of return, so local factors of production must bear the entire burden of the tax. For a rigorous academic treatment of this notion, see Roger Gordon "Taxation of Investment and Savings in a World Economy," *American Economic Review*, vol. 76(5), December 1986, pages 1086-1102. For empirical research verifying the notion, see Aparna Mathur and Kevin Hassett, "Taxes and Wages," AEI Working Paper #128, American Enterprise Institute, June 2006.

spend time or money on tax planning and tax compliance. The extra costs, referred to variously as the excess burden or the deadweight loss of taxes, are important, but our study does not account for them.

We eschew involved modeling of the tax incidence. Instead, simple economic reasoning is used to distribute the tax burdens. In what follows, we describe how we distribute the burden of each tax, but details of the calculations are relegated to the appendix.

The General Excise and Use Taxes

It usually is assumed that the customers bear the full burden of the General Excise and Use Taxes. We use the assumption for purchases by residents, but it is inaccurate. For example, businesses that compete with imports usually are unable to pass the full burden of the tax forward to their customers, because the General Excise Tax (GET) pyramids on itself, whereas competing imports bear Use Tax at only the statutory rate of 4 percent.⁹

Nonresidents (mainly tourists and military personnel stationed in Hawaii) pay an important part of the GET. Part of the amount they pay is exported; the remainder is shifted to landowners and local workers as reduced pretax rents and wages. Because reductions in reported income reduce the federal income tax liability, there is an indirect federal tax offset for part of the GET burden.¹⁰ The federal government also shoulders some of the GET burden directly on its Hawaii purchases.¹¹

The GET is imposed on real estate rentals, and it is also embedded in the price of real estate structures, including owner-occupied housing, because construction is subject to the tax.¹² The rent must cover the cost of the structure, so the GET pyramids on itself for rented structures (as it does for most other expenditures). To the extent the rents reflect returns to land, as opposed to improvements, the GET on rental income is assumed borne by the landowners and not by the renters. The GET on the portion of rental income that represents returns to improvements, however, is probably fully passed forward to renters.

In addition to pyramiding on itself, the GET also pyramids with other State taxes. For example, the GET on materials, and on services that are part of the overhead expenses, raises costs for public utilities. When recouped through higher rates, the higher costs raise the Public Service Company Tax (which is levied on gross income) which, in turn, adds to costs of other businesses that, when recouped in higher prices, increases their GET liability. The cross-tax pyramiding is accounted for indirectly in our calculations, because it is incorporated in the overall effective rates of the taxes on final expenditures.

The Individual Income Tax

The burden of Hawaii's Individual Income Tax is assumed borne entirely by the taxpayer, after subtracting the portion that is shifted to the federal government as reduced payments of

⁹ See the discussion in "Study on the Question 'Is Hawaii's Tax Structure Adequate'," *Report of the 2005-2007 Tax Review Commission*. The business bears part of the burden of the tax, because the price it charges before applying the tax will be forced down more by import competition than would be the case if there were no GET.

¹⁰ The federal income tax code was altered recently to allow taxpayers who itemize to deduct an amount for state sales tax in lieu of the state income tax. Thus, some of the GET may be exported directly as a deduction from the federal tax on income of individuals. However, this option is attractive for only a few Hawaii taxpayers.

¹¹ Businesses are exempt from the GET on sales of tangible personal property to the federal government, but the exemption is lost if the property is sold in conjunction with services.

¹² The GET is embedded in the price of preexisting housing, as well as the price of new construction.

federal income taxes (the federal tax offset) by those who itemize deductions. The assumption is probably a fairly good approximation, although part of the burden of the tax may be passed on to others. For example, a sole proprietor may pass on part of his income tax burden to customers as higher prices, or employees may pass part of the burden to their employer by demanding a higher wage.

The federal tax offset reduces the progressiveness of the State's Individual Income Tax, because the percentage of the State's income tax that is shifted to the federal government grows as the taxpayer's income grows. There are two reasons for this: First, higher-income taxpayers are more likely to itemize deductions; second, the federal income tax is graduated, so the federal income tax saving is larger per dollar of State income tax deducted for the higher-income taxpayers.

The Transient Accommodations Tax

Part of the Transient Accommodations Tax (TAT) is exported to tourists and part is borne as reduced pretax incomes of landowners and residents. Residents also pay a small part of the TAT (about 4 percent) directly when they vacation within the State.

The Corporation Income Tax, the Public Service Company Tax, the Tax on Insurance Premiums, the Tax on Banks and Other Financial Corporations, the County Public Utility Franchise Taxes and Charges for Licenses and Permits

As discussed above, we think that in the long run shareholders avoid the burden from these taxes, so they are borne by consumers (including tourists) as higher prices or by workers and landowners as reduced pretax incomes. We have little evidence to help us decide how the burden is divided among consumers, workers and landowners. In many cases, competition from imports makes it hard for the business to pass the tax forward in higher prices.¹³ Even some local service providers face competition from imports, such as when Hawaii residents hold deposits in out-of-state banks. These taxes account for only 5.6 percent of total receipts, however, so their treatment does not have much effect on the overall tax burden calculations.

The Estate and Transfer Tax

Hawaii's Estate and Transfer Tax (before its recent effective repeal)¹⁴ was administered as a soak-up tax, equal to the credit for state death taxes against the federal estate tax. Therefore, 100 percent of the tax was shifted to the federal government and none was borne by Hawaii residents.

Taxes on Fuel, Liquor, Cigarettes and Tobacco, and Motor Vehicles

The Taxes on Fuel, the Tax on Cigarettes and Tobacco, the State's Liquor Tax and the Motor Vehicle Taxes (including the State surcharge on rental vehicles) are borne largely by the consumer as higher prices. However, tourists pay some of these taxes. Part of the burden of the taxes paid by tourists is exported and part is borne as reduced local pretax incomes.¹⁵

¹³ For the Corporation Income Tax, there is no counterpart to the Use Tax that reduces the competitive disadvantage to local producers caused by the GET.

¹⁴ The tax does not apply to estates of decedents dying after December 31, 2004.

¹⁵ We are evaluating only the effects of Hawaii's taxes, so it is irrelevant for our purposes whether other jurisdictions tax these items.

The Conveyance Tax and the County Real Property Taxes

The burden of the tax on conveyances of real property is distributed in the same manner as the county Real Property Taxes, except it is assumed that commercial properties are transferred only half as often as residential properties. The Real Property Taxes on land and on personal residences are borne by the owners, except the part shifted to the federal government as reduced federal income tax liability. Real Property Taxes paid by non-residents on land are deemed entirely exported. Real Property Taxes on residential rental structures, on nonresidential structures, and on other commercial improvements, however, are distributed in the same manner as the Corporation Income Tax.

The Main Things Determining the Distribution of the Overall Tax Burden

The calculation of tax burdens depends heavily on assumptions that, for lack of a better alternative, often must be based on weak evidence. Therefore, it is useful to stop for a moment and examine the big picture to see what simple reasoning can tell us to expect in the way of results. Table 1 shows that the biggest taxes are the GET, the Individual Income Tax, the county Real Property Taxes and the TAT. Taken together, these taxes accounted for about 83 percent of total tax revenues in fiscal year 2005, so the distribution of the burden of the overall tax structure is heavily influenced by how the burdens of these few taxes are distributed. The burden of the TAT is mostly exported to tourists, so it has only a small role in determining how the overall tax burden of Hawaii's taxes is distributed among residents.

As a rough approximation it is reasonable to suppose that the burden of the GET will be distributed more or less in proportion to consumption, although higher-income individuals probably devote a bigger part of their total spending to items that escape the tax, such as home mortgage payments and tuition to private schools for their children. Higher-income individuals also tend to save a bigger part of their income. Therefore, we might expect the GET to be regressive when measured against total spending, and to be even more regressive when measured against income.

It is hard to predict whether the burden of the Individual Income Tax will be distributed progressively or in proportion to income, especially for those not in the lower income classes. The tax is set at graduated rates, but the top rate is reached at \$60,000 of taxable income for a single individual and at \$80,000 of taxable income for joint filers. Also, the federal offset reduces the burden of the tax more for higher-income taxpayers. It is also hard to predict how the burden of the county Real Property Taxes will be distributed. The tax probably is borne more heavily by those who own their own home, and homeowners tend to be in the higher income classes. Furthermore, renters probably do not bear the burden of the tax as it applies to the land beneath their dwelling. However, housing costs tend to make up a smaller portion of the budget of more affluent taxpayers. Also, the federal offset reduces the burden of the tax more for higher-income taxpayers and not at all for renters.

An important part of the GET is exported to tourists and other nonresidents, but important parts of the Individual Income Tax and the county Real Property Taxes are also exported, either to nonresidents or to the federal government as reduced federal income tax payments. Thus, differences in the rates of tax exporting may not change the order of importance of the taxes for purposes of determining the overall burdens. The GET is the largest of the taxes, being about one and a half times as big as the Individual Income Tax and over twice as big as the county Real Property Taxes, so it should have a bigger influence on the distribution of the overall tax burden. Based on these considerations, we expect reasonable economic

assumptions to yield the result that Hawaii's tax structure is regressive when measured against income.

V. Taxpayer Profiles

We examine tax burdens for the typical single individual and the typical family of four with federal AGI of \$25,000, \$50,000, \$75,000, \$100,000 or \$150,000. The typical taxpayer is an amalgam of the average of Hawaii residents, as constructed from the tax returns and as imputed from the *Survey of Consumer Expenditures* produced by the Bureau of Labor Statistics, U.S. Department of Labor (henceforth the *BLS Survey*). For example, at each level of income, some of the taxpayers rent their home, whereas others own their own home. The amalgam is a weighted average representing both.

We do not calculate tax burdens for income levels below federal AGI of \$25,000, because taxpayers with income lower than this amount are likely to be living with other family members or to be eligible for public assistance, which would make the tax burden comparisons invalid. The *BLS Survey* shows expenditures by taxpayers at different income levels, and by taxpayers in different family circumstances (such as single or married), but it does not provide both breakdowns simultaneously. We are therefore unable to compare how tax burdens vary by type of family unit, and our estimates should not be used to compare the burden of a single taxpayer with that of a family of four. It is likely, however, that a single individual will be able to save more than a family of four with the same income. Therefore, we performed alternative calculations of tax burdens to show the possible effects of the differences in saving between the two types of family units.

VI. The Tax Burden Estimates

Table 2 shows how the burdens of the various taxes are distributed, in the aggregate. We estimate that about 28 percent of the total burden of Hawaii's taxes is shifted to nonresidents (mostly tourists) and to the federal government. The main taxes shifted to nonresidents are the General Excise Taxes paid by tourists and nonresident military personnel, the Transient Accommodations Taxes paid by tourists, the Individual Income Tax paid by nonresidents, and the county Real Property Taxes assessed on land and on residential structures owned by nonresidents. The main taxes shifted to the federal government are the Individual Income Tax, the GET and the county Real Property Taxes.

Table 3 shows the base-case calculations for the tax burdens borne by a single individual and a family of four at various income levels. We emphasize that the tax burden estimates are subject to large errors. One source of error is our assumption about the portion of tax burdens exported to tourists, which is based on econometric estimates for the demand and supply of tourism in Hawaii made by Edwin Fujii, *et al.*¹⁶ They estimated that about two-thirds of the taxes paid by tourists are exported. We think their study is excellent, but it is notoriously hard to estimate demand and supply curves and the reader should know that the fraction of taxes that are exported can easily be bigger or smaller than their estimates imply. Some people argue that the demand for tourism in Hawaii would not respond at all to a change in the price, which means that all of the taxes paid by tourists are exported. However, we believe our assumptions are

¹⁶ *Op. cit.*

more likely to overstate than to understate the amount of tax exported.¹⁷ Another important source of error is the assumption that saving avoids entirely the burden of taxes on expenditures. To try to account for these shortcomings, we performed calculations using alternative assumptions about tax exporting and about the effects of saving on the GET burden.

Table 4 provides the results for the alternative calculations of the tax burdens. To show how a difference in saving behavior of single individuals and the typical family of four might affect the results, we recalculated the GET burdens and burdens of the taxes on business under the assumption that single individuals spend 10 percent less at each income level than the average in the *BLS Survey* and that the family of four spends 10 percent more. The results are given in the rows labeled "GET (2)" and "Burden Ratio (2)." Adjusting for the differences in savings raises the tax burdens for the family of four and reduces them for the single individual. The calculated burden ratios are slightly less regressive than the base case for the single individual (the burden ratio declines by a smaller percentage as income rises) and slightly more regressive for the family of four.

To show how accounting for the taxes on future or past consumption financed from current savings might affect the calculations, we recalculated burdens from the GET and the taxes on business assuming the taxpayer has no savings. The results are given in the rows labeled "GET (3)" and "Burden Ratio (3)."¹⁸ In this case, the tax structure appears much less regressive; the burden ratio declines by only about 11 percent for the family of four and 15 percent for the single individual as one moves from the lowest income level to the highest (compared with 30 percent and 34 percent in the base case.)

Finally, we calculated the tax burdens assuming only half, instead of two-thirds, of the taxes paid by tourists were exported. The results are given in the rows labeled "50% Tax Exporting" and "Burden Ratio (4)." The reduction in tax exporting raises the tax burdens on residents and makes the tax structure slightly more regressive.

In addition to changing the assumptions about the effects of saving and tax exporting, we also estimated how the tax burdens will change under the new income tax laws that take effect in 2007. The results are given in the rows labeled "Individual Income Tax (2)" and "Burden Ratio (5)" in table 4. According to our calculations, the new income tax will make the structure of taxes slightly less regressive - the burden ratio declines by about one percent less when moving from the lowest income class to the highest compared to the base case.

Most of our calculations imply that Hawaii's taxes are regressive, falling from 14 percent or 15 percent of income for those with AGI of \$25,000 to about 9 percent or 10 percent of income for those with AGI of \$150,000. However, the calculations that take account of the GET burden on future or past expenditures financed from current saving show that taxes are only mildly regressive, declining from an average of 14 percent for those with AGI of \$25,000 to an average of about 12 percent for those with AGI of \$150,000.

Whether the county or State taxes are more regressive is ambiguous according to our estimates. In our base case (reported in table 3), for the family of four the burden of county taxes declines by 38 percent as income goes from the lowest to the highest of the income classes,

¹⁷ The estimates in Fujii *et al.* show how the supply and demand for hotel services respond to a change in the price. It is assumed that the supply response indicates the ability of local residents to escape the tax, but part of the supply response probably comes from out-of-state investment in Hawaii's tourism industry.

¹⁸ When calculating the effects of changes in saving, we did not recalculate burdens of the taxes on business. Although strictly speaking this would be consistent with our assumption that much of the burden of these taxes is borne as higher prices to consumers, some of the taxes included in the (namely the tax on category probably

whereas the burden of the State's taxes declines by only 28 percent. However, for the single individual, the burden of the county taxes declines by only 31 percent, whereas the burden of the State's taxes declines by 35 percent.

VII. Comparisons With Previous Studies

There have been four earlier comprehensive studies on the distribution of Hawaii's tax burdens.¹⁹ In addition, the Report to the 2001-2003 Tax Review Commission (*TRC Report*) included an analysis of how the burdens of the GET and the Public Service Company Tax are distributed. In what follows, we provide brief comparisons of our findings with those in the most recent of the comprehensive Miklius, *et al.* and those in the *TRC Report*.

Miklius *et al.* examined how the burdens of Hawaii's State and local taxes are distributed by level of total income in 1988. They used different assumptions to distribute the tax burdens, but many of their results are broadly similar to those in the present study.²⁰ They estimated that 30.8 percent of the burden of Hawaii's taxes was exported in 1988, compared with our estimate of 32.0 percent for 2005. They estimated that 32.9 percent of the GET burden and 16.1 percent of the burden of the Individual Income Tax were shifted to nonresidents or the federal government. Our estimates for these same fractions are 37.9 percent and 22.8 percent. They estimated that 7.2 percent of the total burden of Hawaii's taxes is shifted to the federal government and that 23.5 percent is exported to nonresidents, whereas our estimates for these fractions are 9.6 percent and 21.9 percent. The similarities in the estimates are surprising, particularly given the differences in assumptions and in time periods, and the wide margins of error.²¹

It is harder to compare the results for the disaggregate distributions of the tax burdens, because their measure of income is broader than ours, and because there has been inflation between the time of their study and ours. With these differences noted, our estimates imply that Hawaii's taxes are somewhat less regressive than their estimates imply. Using the mid-point of their income ranges, they show the tax burden ration declining by about half as income rises from \$25,000 to \$150,000 whereas our burden ration declines by only about one third over this income range.²²

¹⁹ The studies are R.H. Hoffman, "Hawaii Tax Rate Distribution Estimates," Report No. 49, The Legislative Reference Bureau, University of Hawaii, Honolulu, 1967; R.D. Ebel and P.N. Kamins, "Who Pays Hawaii's Taxes? A Study of the Incidence of State and Local Taxes in Hawaii for 1970," Social Science and Linguists Institute, University of Hawaii at Manoa, 1975; D. Phares, "The Impact of Hawaii's Taxes: A Look at Taxpayer Burden and Equity," Report submitted to the Hawaii Tax Review Commission, 1984; and Miklius, *et al.*, *Op Cit.*

²⁰ Notable differences between our assumptions and theirs are how the burdens of the Estate and Transfer Tax, the Corporation Income Tax and the Tax on Banks and Other Financial Corporations are borne. They attach the burden of the inheritance taxes to the highest income class, whereas we shift it entirely to the federal government. They calculate a direct federal offset of 10.4 percent for the business taxes and assume that nonresident shareholders bear 11.4 percent of the burden, whereas neither source of tax exporting is available under our assumptions. The three taxes combined account for only a small part of total revenue, however, so the effect on the overall estimates is fairly small.

²¹ The difference in the estimates for the amount of Individual Income Tax shifted to nonresidents may come from our assumption (based on the data for 2003) that nonresidents pay about 7 percent of the tax. Miklius *et al.* do not show any of the burden of the tax as being borne by nonresidents. The difference in the estimates for the portion of the GET burden that is exported appears to come mainly from a difference in estimates for the GET borne by nonresidents other than tourists (military personnel stationed in Hawaii).

²² Assuming their measure of total income is close to personal income, the following adjustments would be needed to compare income levels in our study and theirs. First, inflation has reduced the real purchasing power of a dollar

The study of the distribution of the GET burden in the *TRC Report* was based on a survey of households in Hawaii conducted by the Bureau of Labor Statistics in 1999. They assumed the GET was burden was 4 percent on taxable transactions, so the level of the burden is lower in their calculations than in ours. They calculated the burdens for five income classes; less than \$14,400, \$14,400 to \$27,400, \$27,400 to \$45,00, \$45,00 to \$70,00 and \$70,00 and over. The average income for those in the income class from \$14,400 to \$27,400 was \$21,088 and the average for those with incomes over \$70,000 was \$128,666.²³ They found the GET burden declined by 80 percent (from 5.75 percent to 1.15 percent) from the lowest to the highest income range when the burden was measured as a fraction of income, and by 27 percent (from 2.95 percent to 2.16 percent) when the burden was measured as a fraction of current expenditures.²⁴ This compares with our finding that the GET burden as a fraction of income declined by 55 percent (from 6.4 percent to 2.9 percent) as income increased from \$25,000 to \$150,000 when it is assumed that only current expenditures are taxed, and by 18 percent (from 5.7 percent to 4.7 percent) when it is assumed that all income is eventually taxed.

VIII. Conclusions

Using conventional calculations that ignore the burden of excise taxes on past or future expenditures financed from current saving, we find that Hawaii's tax structure is regressive, with the total tax burden as a fraction of income declining by about a third as annual income rises from \$25,000 to \$150,000. If the burden of the General Excise Tax is measured assuming lifetime earnings and expenditures are approximately equal, however, then the total tax burden as a fraction of income declines by only about one sixth over the same income range.

For the major Hawaii taxes, we find that the fraction of the tax burden that is shifted out of the State, either to nonresidents or the federal government, was highest for the Estate and Transfer Tax, which was entirely shifted to the federal government before its recent effective repeal. Second place belongs to the Transient Accommodations Tax (about 69 percent), followed by the General Excise Tax (about 38 percent) and the county Real Property Taxes (about 34 percent). The estimates of tax exporting for the Transient Accommodations Tax and the General Excise Tax are sensitive to the assumptions about the extent to which the burdens of taxes paid by tourists ultimately are borne by the tourists or are shifted back to residents as lower pretax incomes. The estimates of tax exporting for the county Real Property Taxes are sensitive to the assumptions about non-resident ownership. Both sets of assumptions leave ample room for errors in the calculations.

of income by about 63 percent from calendar year 1988 to fiscal year 2005. Secondly, we calculated that personal income is about 50 percent greater than AGI for Hawaii. Combining these adjustments, AGI of \$25,000 in fiscal 2005 translates into roughly \$23,000 of personal income in 1988 and AGI of \$150,000 in 2005 translates into roughly \$138,000 of personal income in 1988.

²³ The calculations in the *TRC Report* are for 2002, whereas ours are for fiscal year 2005. Inflation reduced the real value of a dollar of income by about 9 percent between the two periods, so the averages of their lowest and highest income groups would translate into about \$23,000 and \$140,000 in fiscal year 2005.

²⁴ The latter calculations account for the fact that taxpayers do not escape entirely the burden of the GET on saving and is similar to our calculations in which we assumed all income was eventually subject to GET. In both cases, the change in the rate of the tax burden at different levels of income comes entirely from the mix of taxable and nontaxable purchases in the different income classes, rather than from changes in saving.

TABLE 2

**Aggregate
Distribution of Tax Burdens**
(In \$millions)

Tax	Total Revenue	Amount Borne By Residents		Amount Shifted Out of State	
		Higher Prices	Reduced Incomes	Federal Government	Other
Hawaii State Taxes					
1. General Excise and Use Taxes.....	2,136.6	1,114.0	212.7	134.4	675.5
2. Individual Income Tax.....	1,381.5		1,067.1	237.4	77.0
3. Transient Accommodations Tax.....	198.8	7.9	53.8	9.5	126.8
4. Public Service Company Tax....	108.7	57.4	30.8	5.5	15.0
5. Corporation Income Tax.....	85.6	45.2	24.3	4.3	11.8
6. Tax on Insurance Premiums.....	83.1	43.9	23.5	4.2	11.5
7. Tax on Banks and Other Financial Corporations...	38.5	20.4	10.9	1.9	5.3
8. Estate and Transfer Tax ^a	12.7			12.7	
9. Conveyance Tax.....	24.6	4.4	12.0	1.8	5.5
10. Taxes on Fuel.....	106.5	77.0	6.3	1.1	22.2
11. Tax on Liquor.....	43.7	34.6	2.6	0.4	6.1
12. Taxes on Cigarettes and Tobacco.....	85.2	74.6	3.0	0.5	7.1
13. Motor Vehicle Taxes ^b	<u>100.3</u>	<u>56.3</u>	<u>12.5</u>	<u>2.2</u>	<u>29.3</u>
<i>Total, State Taxes</i>	4,405.8	1,533.6	1,461.4	417.1	993.0
County Taxes					
1. Real Property Taxes.....	968.3	88.0	550.5	118.0	211.9
3. Fuel Tax.....	76.3	55.1	4.5	0.8	15.9
2. Motor Vehicle Weight Tax.....	60.3	60.3			
4. Public Utility Franchise Tax.....	41.5	21.9	11.8	2.1	5.7
5. Public Service Company Tax.....	42.5	22.4	12.1	2.1	5.9
6. Licenses and Permits ^c	<u>63.9</u>	<u>33.8</u>	<u>18.1</u>	<u>3.2</u>	<u>8.8</u>
<i>Total, County Taxes</i>	1,252.8	281.5	597.0	126.2	248.2
<i>Total, State and County Taxes</i>	5,658.6	1,815.1	2,058.4	543.3	1,241.2

^a Hawaii's Estate and Transfer Tax has been effectively repealed for decedents dying after December 31, 2004.

^b Includes the State's Motor Vehicle Weight Tax and the surcharge on rental and tour vehicles. The rental surcharges produced \$43,950,000 of the total revenue in this category.

^c Excludes the counties' Motor Vehicle Weight Taxes.

Source: Authors' calculations.

Table 3**Distribution of Tax Burdens by Income Class*****Income and Expenditures***

	\$25,000	\$50,000	\$75,000	\$100,000	\$150,000
Income (Federal AGI).....	\$25,000	\$50,000	\$75,000	\$100,000	\$150,000
Expenditures.....	28,000	41,380	55,010	70,330	93,730
Expenditures subject to GET	18,490	25,820	31,320	39,290	50,990

Tax Burden for a Single Individual

GET.....	1,599	2,232	2,709	3,397	4,409
Individual Income Tax.....	958	2,077	3,235	3,863	6,261
TAT.....	51	93	139	162	238
Taxes on Business ^a	249	411	582	707	995
Real Estate Taxes ^b	539	981	1,461	1,707	2,501
Alcohol & Tobacco.....	105	108	111	114	119
Fuel & Motor Vehicles ^c	268	279	290	302	325
Total Tax Burden.....	3,769	6,181	8,527	10,252	14,848
Burden Ratio.....	15.1%	12.4%	11.4%	10.3%	9.9%
Burden Ratio, State Taxes....	12.2%	10.0%	9.1%	8.2%	7.9%
Burden Ratio, County Taxes...	2.9%	2.4%	2.3%	2.1%	2.0%

Tax Burden for a Family of four

GET.....	1,599	2,232	2,709	3,397	4,409
Individual Income Tax.....	423	1,431	2,561	3,691	5,616
TAT.....	53	96	142	166	243
Taxes on Business ^a	256	422	581	724	985
Real Estate Taxes ^b	605	1,080	1,523	1,866	2,577
Alcohol & Tobacco.....	207	210	212	216	222
Fuel & Motor Vehicles ^c	396	599	700	789	811
Total Tax Burden.....	3,542	6,074	8,427	10,856	14,859
Burden Ratio.....	14.2%	12.1%	11.2%	10.9%	9.9%
Burden Ratio, State Taxes.....	10.8%	9.2%	8.6%	8.4%	7.8%
Burden Ratio, County Taxes....	3.4%	2.9%	2.6%	2.5%	2.1%

a Includes the Corporation Income Tax, State and county Public Service Company Taxes, the Tax on Banks and Other Financial Corporations, the Tax on Insurance Premiums, the county Public Utility Franchise Taxes, and the county charges for licenses and permits.

b Includes the Conveyance Tax and the county Real Property Taxes.

c Includes the State surcharge on motor vehicle rentals.

Source: Author's calculations.

Table 4
Alternative Calculations for the
Distribution of Tax Burdens by Income Class

Income and Expenditures

Income (Federal AGI).....	\$25,000	\$50,000	\$75,000	\$100,000	\$150,000
Expenditures.....	28,000	41,380	55,010	70,330	93,730
Expenditures subject to GET	18,490	25,820	31,320	39,290	50,990

Tax Burden for a Single Individual

Total Tax Burden.....	3,769	6,181	8,527	10,252	14,848
Burden Ratio.....	15.1%	12.4%	11.4%	10.3%	9.9%
GET (2) ^a	3,599	5,930	8,217	9,865	14,341
Burden Ratio (2) ^a	14.4%	11.9%	1.0%	9.9%	9.6%
GET (3) ^b	3,612	6,763	9,789	11,990	18,046
Burden Ratio (3) ^b	14.4%	13.5%	13.0%	12.0%	12.0%
50% Tax Exporting ^c	3,900	6,392	8,816	10,601	15,333
Burden Ratio (4) ^c	15.6%	12.8%	11.8%	10.6%	10.2%
Individual Income Tax (2) ^d ..	3,680	6,093	8,409	10,161	14,761
Burden Ratio (5) ^d	14.7%	12.2%	11.2%	10.2%	9.8%

Tax Burden for a Family of four

Total Tax Burden.....	3,542	6,074	8,427	10,856	14,859
Burden Ratio.....	14.2%	12.1%	11.2%	10.9%	9.9%
GET (2) ^a	3,719	6,325	8,737	11,244	15,366
Burden Ratio (2) ^a	14.9%	12.7%	11.6%	11.2%	10.2%
GET (3) ^b	3,385	6,656	9,689	12,594	18,057
Burden Ratio (3) ^b	13.5%	13.3%	12.8%	12.6%	12.0%
50% Tax Exporting ^c	3,675	6,289	8,712	11,209	15,334
Burden Ratio (4) ^c	14.7%	12.6%	11.6%	11.2%	10.2%
Individual Income Tax (2) ^d ...	3,444	5,985	8,297	10,374	14,683
Burden Ratio (5) ^d	13.8%	12.0%	11.1%	10.4%	9.8%

a The rows labeled "GET (2)" and "Burden Ratio (2)" show the total tax burdens calculated assuming expenditures are 10 percent less than those shown in the *BLS Survey* for the income class for single individual and 10 percent more for the family of four.

b The rows labeled "GET (3)" and "Burden Ratio (3)" show the total tax burdens calculated assuming expenditures are equal to income.

c The rows labeled "50% Tax Exporting" and "Burden Ratio (4)" show the total tax burdens calculated assuming that only one-half (instead of two-thirds) of taxes paid by tourists are exported.

d The rows labeled "Individual Income Tax (2)" and "Burden Ratio (5)" show the total tax burdens as estimated for the new Individual Income Tax rules that takes effect on January 1, 2007.

Source: Author's calculations.

Appendix

Explanations of Detailed Calculations for the Tax Burdens

Following are detailed explanations for the calculations of the tax burdens, including the data sources used. In some cases, the tax burden is not followed to the end of its path, either because we lack the needed data, or because the path is murky and too hard to follow. For the most part, the missing adjustments are small and well within the overall margin of error of the calculations.

General Excise and Use Taxes

The General Excise and Use Taxes were distributed as follows. The average effective rate of the taxes on taxable personal consumption expenditures was calculated by first subtracting the amount of the Capital Goods Excise Tax Credit from the total of the General Excise and Use Tax receipts and then dividing the remainder by the amount of taxed final expenditures in Hawaii, omitting gross private investment by business. The Capital Goods Excise Tax Credit gives back to business part of the excise and use taxes, so it must be subtracted from the total. Excise taxes on business-to-business sales and on gross business investment must eventually be recovered in the price of final consumption. We assumed that the rate of excise tax on investments that is embodied in final prices is stable over time. The effective rate of tax on taxable final expenditures was calculated to be 4.5 percent. This is higher than the statutory tax rate of four percent, because the tax pyramids on itself.

To distribute the aggregate tax burden, the share of the General Excise and Use Taxes paid by tourists and other nonresidents was calculated by multiplying total collections of the taxes by the share of the nonresident expenditures in total final expenditures on taxable items. The nonresident expenditures include purchases of taxable goods and services by military personnel stationed in Hawaii. To calculate these expenditures, it was assumed that 60 percent of final expenditures by the federal government on inputs from the government sector consist of compensation paid to military personnel that is spent on taxable goods and services in Hawaii.

It was assumed that a third of the taxes paid by tourists is shifted to residents as a reduction in pretax income.²⁵ The reduction was calculated to amount to 0.8 percent of personal income. The reduction in income reduces federal income tax collections, so part of the burden is shifted to the federal government, calculated using a marginal tax rate of 15 percent. The federal government also buys taxed goods and services, so it bears part of the GET burden directly.

To distribute the GET burden by income class, rate of GET borne by residents on taxable final expenditures (calculated at 4.5 percent) was multiplied times taxable final expenditures at each income level as reported in the *BLS survey*. Expenditures subject to the GET were only about 47 percent of income in the *BLS Survey*, but the input-output table for Hawaii indicated that such expenditures are about 60 percent of personal income. Also, the income used in our calculations is based on AGI, which is substantially smaller than personal income.²⁶ The ratio of personal income in to AGI in Hawaii is about 1.5. Therefore, to get measures of the GET burden on AGI that are comparable to the burdens of the Individual Income Taxes and other taxes, we

²⁵ The portion of taxes shifted to residents is based on the study by Edwin Fujii, James Mak and Mohammed Khaled, *op cit*.

²⁶ See, for example, Thae S. Park, "Relationship Between Personal Income and Adjusted Gross Income, 1991-1992," *Survey of Current Business*, Bureau of Economic Analysis, U.S. Department of Commerce, August, 1994.

multiplied the GET burden on taxable expenditures in the *BLS Survey* by (60/47) and by 1.5. Finally, a component was added to account for the part of the GET on expenditures of tourists that is passed back to Hawaii residents as a reduction in income.

The aggregate distribution of tax burdens was calculated using data for fiscal year 2005. Data on revenue from the General Excise and Use Taxes are from the Department of Taxation's data files. Data used to calculate the rate at which the capital goods excise tax credit reduced GET collections are from the Department of Taxation's report *Tax Credits Claimed by Hawaii Taxpayers – 2003*. The data on final expenditures, including those used to calculate the share of personal consumption expenditures made by non-resident military personnel, are from *The 2002 State Input-Output Study for Hawaii* produced by the Hawaii State Department of Business, Economic Development and Tourism (DBEDT). Personal consumption expenditures for each profiled taxpayer unit are from the *BLS Survey* for 2004. Total personal income of Hawaii residents is taken from U.S. Department of Commerce, Bureau of Economic Analysis. Data on federal AGI in Hawaii are from Department of taxation files.

Individual Income Tax and Taxes That Reduce Pretax Income

Individual Income Taxes paid by nonresidents were assumed entirely exported. For the aggregate, it was estimated that estimated that 18.2 percent of the burden of the Individual Income Taxes on residents was shifted to the federal government as a reduction in the federal income tax liability. The estimate is the weighted average of the marginal federal tax rates at different income levels, weighted by the portion of taxpayers that itemized deductions on their federal income tax returns at each income level (calculated from Internal Revenue Statistics) and by the share of the income level in total Hawaii income (calculated from Department of Taxation data).

To distribute the burden of the tax by income class, for each taxpayer unit profiled and for each income level, the effective rate of Hawaii income tax on federal AGI was calculated as the actual average tax rate paid by the profiled taxpayer in 2003 (the latest year for which data were available at the time of writing) divided by federal AGI. The data for the calculations are from the Department of Taxation's files. To calculate the portion shifted to the federal government, we first found the proportion of taxpayers who itemize deductions at each income level and for each taxpayer unit profiled. Then, this proportion was multiplied by the marginal federal income tax rate for the taxpayer unit and the product was multiplied by the State income taxes paid.

In addition to the State income tax burden, Hawaii residents also bear part of the burden from other Hawaii taxes as reduced pretax incomes. Because a reduction in pretax income reduces the federal income tax liability, part of the burden of these taxes is shifted to the federal government, regardless of whether the taxpayer itemizes deductions. Thus, the burden of taxes borne as foregone pretax income was reduced by a federal income tax offset at a rate equal to the marginal federal income tax rate for the profiled taxpayer, with no adjustment for the proportion that itemized their deductions. The calculations for the reductions in pretax income caused by other taxes are described in the subsections for the other taxes.

Hawaii recently reduced its statutory income tax rates and expanded the income tax brackets. To account for these changes, we first calculated the Individual Income Tax before the legislated changes, based on the actual deductions and the statutory tax rates. The calculations overstate the actual tax, because they do no account for tax credits. We then performed the same calculation using the new statutory tax rates. Finally, we multiplied the ratio (tax calculated

under the old law)/(actual tax paid) times the tax calculated under the new law to estimate the actual tax under the new law.

The Transient Accommodations Tax

We assume one-third of the burden of the TAT paid by tourists is shifted to local income and is distributed in proportion to income. To calculate the effective tax rate on income, we divide one-third of the total TAT receipts by Hawaii total personal income. To measure the effect by income level, we multiplied the part shifted to residents as a reduction in income times 1.5 to account for the difference in the levels of personal income and AGI. Data on TAT revenue are from the Department of Taxation's files. Data on Hawaii total personal income are from Bureau of Economic Analysis, U.S. Department of Commerce. Hawaii residents who vacation within the State account for about 4 percent of total TAT revenues. This part of the TAT is distributed to residents in proportion to income.

The Corporation Income Tax, the Public Service Company Tax, the Tax on Insurance Premiums, the Tax on Banks and Other Financial Corporations, and Charges for Licenses and Permits

We assume that one-third of the burden of these taxes is borne as reductions in pretax income of individuals and two-thirds as higher prices on final expenditures. The distribution fractions are measured after the effects of the taxes on prices paid by tourists, part of which feed back as reductions in pretax incomes. To get the effective rate of tax on final expenditures, the revenue from the taxes was divided by total final expenditures in Hawaii, excluding gross investment. The ratio of final expenditures to gross State output (GSP) was taken from DBEDT's 2002 input-output study. To get final expenditures in fiscal year 2005, the ratio was multiplied by the average of GSP in 2004 and the forecast for 2005 given in DBEDT's *Quarterly Statistical & Economic Report, 2nd Quarter 2006*. To distribute the burdens of the taxes by income class, we multiplied the taxes on expenditures calculated using the expenditures reported in the *BLS Survey* by 1.5 to account for the discrepancy between AGI and personal income.

To get the effective rate of tax on income, one-third of the revenue was divided by total personal income. (To account for the difference between personal income and AGI, the tax rate was multiplied times 1.5 when calculating the tax burdens on AGI.) This part of the tax burden is borne by wages and land rents, not by income of capital, so the calculations understate the effect on these income types. However, we apply the effective tax rate to all income of individuals. This procedure amounts to assuming that incomes from land, capital and wages are the same fraction of the total for taxpayers at different income levels and that wages and land rents bear the burden at the same rate. None of these assumptions is likely to be correct, but we have no better alternatives to offer. Combined, these taxes accounted for 8 percent of total State and county taxes in fiscal year 2005.

Taxes on Fuel, Liquor, Cigarettes and Tobacco, and Motor Vehicles

The bulk of the Taxes on Fuel are borne as increased prices to resident motorists, but the taxes also raise the price of consumption throughout the economy. We distribute the burden of the taxes to tourists according to their share of the *de facto* population. Two-thirds of the taxes paid by tourists are exported and one-third reduces pretax incomes of residents. The part not paid by tourists is distributed in the same manner as the Motor Vehicle Weight Tax (as described below).

The burden of the Liquor Tax and the Cigarette and Tobacco Tax per adult is obtained by dividing the amount of the taxes by the number of adults. The number of adults is calculated by multiplying the percentage of adults in the population times the *de facto* population. Data on the tax collections are from the Department of Taxation files. Data on the resident population and the *de facto* population are from DBEDT's *Hawaii Data Book*. The rates of tax are calculated using data for calendar year 2004.

The share of the taxes on liquor, cigarettes and tobacco paid by tourists was assumed to be the same as their share of the *de facto* population. One-third of the burden of the taxes paid by tourists was assumed shifted back to local residents as a reduction in pretax income.

The effective rate of the State and county Motor Vehicle Weight Taxes on residents was calculated by dividing the tax receipts by the number of registered vehicles in Hawaii. For the family of four, the tax rate was applied to vehicle ownership for the income level as reported in *BLS Survey*. It was assumed that the single individual owned only one vehicle. Data on the number of registered vehicles are from DBEDT's *Hawaii State Data Book*. The effective tax rate was calculated using data for 2004. Tourists pay the bulk of the State's surcharge on rental vehicles, but it was assumed that one-third of the tax was shifted to residents as reduced pretax incomes.

The Conveyance Tax and the County Real Property Taxes

The Conveyance Tax is incurred when real property is transferred. We have data on total revenue from the tax, but not on the type of transactions that occurred. We distributed the burden of the tax in the same manner as the county Real Property Taxes, except we assumed that transfers were half as frequent for commercial property as for residential property.

The county Real Property Taxes are distributed as follows. Property taxes on land owned by residents are distributed in proportion to income. The effective rate of tax on personal income is calculated by dividing the taxes on locally owned land by Hawaii total personal income. The burden of property taxes on business improvements (commercial, industrial, agricultural, hotel or resort) is distributed in the same manner as the Corporate Income Tax. That is, two-thirds of the burden is assumed borne as higher prices and one-third is borne as reduced pretax incomes. The rate of the higher prices is calculated by dividing two-thirds of the tax revenues on the business improvements by total final expenditures (including expenditures not subject to GET). The rate of the burden on income is calculated by dividing one-third of the tax on business improvements by Hawaii total personal income. The county Real Property Taxes on residential property are assumed borne by residential property owners and are distributed in proportion to income. The rate of the burden is calculated by dividing the tax on residential property by Hawaii total personal income. Data on county Real Property Taxes are from the publication *Real Property Tax Valuations Tax Rates & Exemptions, 2005-2006 Tax Year, State of Hawaii*, produced by the Real Property Assessment Division, Department of Budget and Fiscal Services, City and County of Honolulu. The data for the City and County of Honolulu do not show taxes on land and improvements separately, so they were imputed using the ratios in the rest of the State.

Assumptions were made on the proportion of residential property that is rented and the proportion of land that is owned by nonresidents. The assumptions are based on informal samples of the county real property records. Based on the samples, it was assumed that external ownership accounts for 6 percent of the property taxes on single-family homes, for seventy 70 percent of the taxes on apartments, for eighty percent of the taxes on commercial and industrial

properties, for ninety percent of hotel and resort properties and for 50 percent of agricultural properties.

