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# The Effect of Insurance Premium Taxes on Employment

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# I. Introduction

While not the most visible of taxes, the state insurance premium tax is levied on insurance companies by every state, generally as a substitute for the state corporate income tax being imposed on insurers. For the U.S. in 2006, $15.4 billion in taxes on insurance premiums were collected on $1.26 trillion worth of insurance premiums and annuity considerations, accounting for approximately 2.4 percent of state tax revenue. In Georgia, the insurance premium tax generated $341.7 million in revenue in FY 2007, which was 1.92 percent of total state tax revenue.

Table 1 contains a list of the number of insurance companies by product line domiciled in each state in 2006. There is a wide variation among the states. Larger states in terms of population tend to have more domestic companies, but there are exceptions. For example, Vermont has some almost 500 "other" companies, which are so-called captive companies owned by non-insurer parents. Arizona has a large number of life and health companies. Texas has some 151 property-liability companies, many of which write insurance in a relatively small area and are the result of historical regulatory policy.

The average state in 2004 had about 40 domestic companies and an additional 597 foreign companies operating in the state. The average state also had about 2 percent of the national property casualty employment and about $2.4 million in premiums per 1,000 people. The average domestic property-casualty market share was just under 20 percent.

The premium tax rates in the U.S. range around 2.5 percent, but because the tax is on gross premiums rather than profits, its effects may be quite substantial. For example, Neubig, Jaggi, and Messina (2002) estimate that the premium tax is almost double the tax that an insurance firm would pay if it were subject to the state corporate income tax.

**TABLE 1. DISTRIBUTION OF INSURANCE COMPANIES BY STATE, 2005**

| State | Life/ Health | Property/ Casualty | Health Only* | Other** | Total | % of US Total |
|---|---|---|---|---|---|---|
| Alabama | 13 | 22 | 5 | 4 | 44 | 0.57 |
| Alaska | 0 | 7 | 2 | 2 | 11 | 0.14 |
| Arizona | 220 | 46 | 19 | 66 | 351 | 4.58 |
| Arkansas | 35 | 11 | 8 | 16 | 70 | 0.91 |
| California | 27 | 125 | NA | 34 | 186 | 2.43 |
| Colorado | 10 | 18 | 21 | 16 | 65 | 0.85 |
| Connecticut | 32 | 69 | 6 | 2 | 109 | 1.42 |
| Delaware | 37 | 79 | 10 | 7 | 133 | 1.73 |
| D.C. | 3 | 7 | 7 | 65 | 82 | 1.07 |
| Florida | 40 | 124 | 72 | 317 | 553 | 7.21 |
| Georgia | 15 | 39 | 14 | 60 | 128 | 1.67 |
| Hawaii | 3 | 17 | 5 | 158 | 183 | 2.39 |
| Idaho | 3 | 9 | 6 | 1 | 19 | 0.25 |
| lIIinois | 70 | 197 | 25 | 98 | 390 | 5.09 |
| Indiana | 44 | 69 | 18 | 54 | 185 | 2.41 |
| Iowa | 23 | 54 | 9 | 115 | 201 | 2.62 |
| Kansas | 14 | 26 | 7 | 3 | 50 | 0.65 |
| Kentucky | 9 | 7 | 12 | 24 | 52 | 0.68 |
| Louisiana | 51 | 33 | 11 | 37 | 132 | 1.72 |
| Maine | 2 | 21 | 4 | 0 | 27 | 0.35 |
| Maryland | 8 | 46 | 24 | 1 | 79 | 1.03 |
| Massachusetts | 19 | 54 | 14 | 5 | 92 | 1.20 |
| Michigan | 25 | 67 | 46 | 9 | 147 | 1.92 |
| Minnesota | 12 | 50 | 16 | 99 | 177 | 2.31 |
| Mississippi | 23 | 17 | 3 | 7 | 50 | 0.65 |
| Missouri | 34 | 53 | 27 | 115 | 229 | 2.99 |
| Montana | 2 | 4 | 4 | 26 | 36 | 0.47 |
| Nebraska | 28 | 35 | 4 | 34 | 101 | 1.32 |
| Nevada | 2 | 14 | 14 | 66 | 96 | 1.25 |
| New Hampshire | 3 | 29 | 8 | 1 | 41 | 0.53 |
| New Jersey | 6 | 86 | 4 | 17 | 113 | 1.47 |
| New Mexico | 3 | 9 | 9 | 0 | 21 | 0.27 |
| New York | 85 | 194 | 57 | 223 | 559 | 7.29 |
| North Carolina | 5 | 66 | 14 | 2 | 87 | 1.13 |
| North Dakota | 3 | 17 | 5 | 15 | 40 | 0.52 |
| Ohio | 37 | 135 | 28 | 63 | 263 | 3.43 |
| Oklahoma | 28 | 50 | 11 | 7 | 96 | 1.25 |

*Table 1 continues next page…*

**TABLE 1 (CONT). DISTRIBUTION OF INSURANCE COMPANIES BY STATE, 2005**

| State | Life/ Health | Property/ Casualty | Health Only* | Other** | Total | % of US Total |
|---|---|---|---|---|---|---|
| Oregon | 3 | 15 | 22 | 108 | 148 | 1.93 |
| Pennsylvania | 37 | 193 | 41 | 30 | 301 | 3.93 |
| Rhode Island | 4 | 24 | 4 | 0 | 32 | 0.42 |
| South Carolina | 14 | 34 | 9 | 123 | 180 | 2.35 |
| South Dakota | 1 | 18 | 6 | 19 | 44 | 0.57 |
| Tennessee | 14 | 20 | 11 | 22 | 67 | 0.87 |
| Texas | 157 | 237 | 52 | 31 | 477 | 6.22 |
| Utah | 15 | 10 | 12 | 16 | 53 | 0.69 |
| Vermont | 2 | 15 | 4 | 546 | 567 | 7.40 |
| Virginia | 14 | 18 | 19 | 25 | 76 | 0.99 |
| Washington | 10 | 21 | 21 | 4 | 56 | 0.73 |
| West Virginia | 2 | 5 | 5 | 11 | 23 | 0.30 |
| Wisconsin | 35 | 182 | 37 | 126 | 380 | 4.96 |
| Wyoming | 0 | 2 | 2 | 1 | 5 | 0.07 |
| United States*** | 1299 | 2725 | 811 | 2831 | 7666 | |

*Blue Cross/Blue Shield, HMOs and hospital, medical and dental indemnity (HMDI) plans that provide stipulated payments to an insured person during hospital confinement for virtually all costs related to hospital stays; other medical expenses; and for dental services and supplies.
**Includes Fraternal, Title, Risk Retention Group, and Other lines.
***Includes territories and possessions.
Source: Insurance Information Institute, 2006 Insurance Fact Book, http://www.iii.org/financial2/insurance/allsectors/ and NAIC Annual Statement for 2006.

Georgia has one of the higher insurance premium tax rates, and over time there have been calls for reducing that rate.[1] One consideration is what effect would reducing the tax rate have on employment within the state. However, the literature that addresses whether such a strategy would be successful is thin. This report provides estimates of the effect of the insurance premium taxes on state-level employment in the insurance industry. To estimate the effect we calculated for each state for each year for the period 1992-2004 the effective tax rate on premiums written by domestic insurers and on premiums written by foreign insurers (see below for a discussion of domestic tax rate and foreign tax rate). Using regression analysis,

[1] For a discussion of Georgia's insurance premium tax, see Grace (1998).

we related differences in insurance premium tax rates across states and over time to employment levels.

To anticipate the results, we find that the effective insurance premium tax rate on property-casualty insurance companies has a negative effect on state-level employment in the insurance industry. The coefficients on both tax rate variables are negative and statistically significant. Furthermore, the coefficient on the foreign tax rate is larger than the coefficient on the domestic tax rate, as expected. The elasticity between per capita employment in the insurance industry and the domestic tax rate is -0.046, and is –0.092 with respect to the foreign tax rate. These results imply that a 10 percent reduction in the tax rate (2.22 to 2.42 percent) translates into approximately 39 additional jobs for a change in the domestic rate and 78 additional jobs for a change in the foreign company rate for the average state**.** For Georgia, the results imply that a one percentage point reduction in the domestic premium tax rate would generate 334 new jobs, while an equal reduction in the foreign premium tax rate would generate 525 new jobs.

The remainder of the report proceeds as follows. In the next section the insurance premium tax is described and the relevant literature discussed. Section 3 presents a simple discussion of the location incentives created by the insurance premium tax, while Section 4 discusses insurance premium tax rates. Section 5 contains a simple analysis of the relationship between tax rates and employment, while Section 6 presents the multiple regression analysis. Concluding comments finish the report.

## II. Taxes on Insurance Premiums

The regulation and taxation of the insurance industry has been left almost entirely to the states. A post-Civil War Supreme Court decision asserted the fact that insurance was subject solely to state regulation and that the Congressional commerce power did not apply to the regulation and taxation of the industry.[2] That changed in 1944, when the Supreme Court, in *U.S. v. Southeastern Underwriters,* held that the insurance industry was subject to the Constitutional commerce clause provisions, and specifically, the antitrust laws. Congress reacted almost immediately to overturn *Southeastern Underwriters* by passing the McCarran Ferguson Act of 1945, which returned to the states the sole power over regulation and taxation of insurance.

Because states had free reign to tax the insurance industry, a number of anomalies developed. First, as states were not subject to commerce clause restrictions on taxation, they could, and did, discriminate against out-of-state commerce by imposing a higher tax rate on out-of-state carriers.[3] Second and almost uniformly, states adopted defenses to these discriminatory taxes in the form of a so-called retaliatory tax.[4] That is, if state A would tax state B's companies at a higher rate than its own companies, State B would tax State A's companies at the higher of the two states' tax rates.

Retaliatory taxes are discriminatory taxes imposed on insurance providers chartered in states with higher premium tax rates than in the state from which it collects premiums. All states except Hawaii impose retaliatory taxes.[5] In practice, the retaliatory tax operates to tax away any advantage an out-of-state company may have because of lower taxes imposed in the state in which the company is domiciled.

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[2] *Paul v. Virginia* 75 U.S. (8 Wall.) 168 (1869).

[3] The commerce power generally restricts states from taxing out-of-state companies at differentially higher rates. See *Bacchus Imports v. Dias,* 468 U.S. 263 (1984).

[4] The Supreme Court upheld the use of retaliatory taxation by the states in *Western & Southern Life Insurance Company v. State Board of Equalization* (451 U.S. 648 (1981) based on the notion that Congress gave power to the states to tax and removed commerce power restrictions.

[5] Hawaii has the highest insurance premium tax rate in the nation so it has no need for a retaliatory tax.

A company thus pays the higher of the premium tax in the state in which the insurance policy is written and the state in which the company is domiciled. For instance, if a Tennessee company, which faces a domestic premium tax rate of 2.50 percent, writes a policy in Georgia, which has a total premium tax of 4.75 percent, then the company faces a premium tax of 4.75 percent on the policies written in Georgia.[6] On the other hand, if a Georgia company writes a policy in Tennessee, then the Georgia company faces the 2.50 percent Tennessee tax rate plus a retaliatory tax of 2.25 percent, i.e., the difference between the Tennessee tax rate of 2.50 percent and the Georgia tax rate of 4.75 percent, for a combined tax of 4.75 percent. Thus, the retaliatory tax operates so that the lowest tax rate an insurer will face nationally is the rate in their home state. This provides an incentive for insurance companies to locate in states with a low tax rate.

The retaliatory tax was challenged in *Western and Southern Life Insurance Company v. State Board of Equalization*.[7] It is commonly believed the retaliatory tax is necessary to keep states from engaging in extreme domestic preferences that result in taxing other states' companies at high rates. In *Western and Southern,* the Court upheld the constitutionality of the retaliatory tax based on the congressional delegation of authority to the states in the McCarran-Ferguson Act. Because Congress specifically exempted insurance from the commerce clause's restrictions, the Court allowed the states to tax in any way they deemed necessary.[8]

In general, insurance companies are not subject to the state corporate income tax, but are taxed on the value of premiums written in a state. All companies writing policies in a state are subject to the premium tax, which is levied as a fixed percentage of the value of the premiums written in the state less a deduction for any

[6] Georgia has a state premium tax rate of 2.25 percent and a local premium tax rate of 2.5 percent, for a total of 4.75 percent.
[7] 451 U.S. 648 (1981).
[8] The Court did have trouble with the Equal Protection Clause argument, and this was the genesis for the Court's decision in *Metropolitan v. Ward* (470 U.S. 869 (1985)) invalidating the broad protection a state had in setting domestic preferential tax rates.

premiums returned or dividends paid to the policyholder.[9] Many states apply different rates to the various lines of insurance, such as property and casualty, life, health, reinsurance, self-insurance, and other, nontraditional lines. In addition, some states lower the rates under certain conditions. For example, in Georgia if the insurer invests a quarter of its assets in certain qualified investments, the state tax rate is lowered from 2.25 to 1.25 percent. If the invested amount is equal to 75 percent of total assets, then the tax rate is further lowered to 0.005 percent.

Neubig and Vlaisavljevich (1992) provide a thorough review of the non-federal taxes facing insurance companies. These include premium taxes and income or franchise taxes, but also may include state and local property taxes. In all states, the premium tax paid is credited against the corporate income tax so that the firm only pays the greater of the two liabilities, which is always the premium tax. Many states offer special domestic company tax credits or preferences, such as tax credits for investments and employment and retaliatory taxes paid to other states. Finally, states may require companies to pay into a guaranty fund designed to cover the claims of insolvent insurance companies. While some states offer a credit against the premium tax for amounts paid into the fund, not all do, nor do all the others provide a 100 percent credit (NAIC, 2006).

There has been little written on the effects of taxes as they relate specifically to the insurance industry, and none of the papers consider the effect on employment. The paper closest to the current paper is by Wheaton (1986), who considers the impact of state taxes on life insurance company asset growth rates. Using company level data on the 77 largest life insurance companies in the country, the author constructs an effective tax rate consisting of the combined effect of domestic and foreign premium taxes, and other aspects of state tax law to determine the effective state tax rate for a typical firm for several states. Company growth in assets over the

[9] While almost every state has the premium tax, some have both a premium tax and an income tax. However, because the premium tax is always greater than then income tax (and the income tax is creditable against the premium tax), in this paper we refer to the premium tax as the method of taxing the insurance industry.

1966-1981 period is regressed against this effective tax rate as well as other factors believed to be determinants of company growth. The econometric analysis reveals a consistently negative and significant coefficient associated with the effective state tax rate. While the results indicate a fairly small effect, a $10 million increase in tax liability decreases company growth by 0.9 percent, the effect is statistically significant. While illustrative of the effect of premium taxes on insurers' growth prospects, Wheaton does not consider the effect of taxes on the location of headquarters or employment.

There are other documented effects of the premium tax. Petroni and Shackelford (1995), for example, consider the effect of both state taxes and regulation on the choice of organizational form of property and casualty insurers. The results indicate that states with higher insurance premium tax rates and regulatory burdens have significantly lower numbers of domesticated insurance companies or a lower percentage of insurance premiums sold by domestic insurers. In addition, Ke, *et al.* (2000) find that increases in taxes on premiums of non-automobile lines of insurance increase self-insurance in a state.

## III. Incentives of State Premium Taxes and Location of Insurance Industry Employment

We start with a simple example to illustrate the incentive that the insurance premium tax has on insurance companies. The premium tax is a form of gross receipts tax paid on a destination basis. If this was the end of the story, the premium taxes would not affect where the firm located. However, the presence of the retaliatory taxes changes the incentive. For example, consider the hypothetical example presented in Table 2. Assume that a firm is considering locating in one of three states, denoted Low, Medium, and High to reflect the relative magnitude of their premium tax rate. Let $t$ represent the state premium tax rate and $P$ represent the value of total premiums written in a state.

**TABLE 2. ILLUSTRATION OF PREMIUM TAX**

| | Premium Tax Rate | Premium Tax Paid |
|---|---|---|
| State Low | 1% | $(t_L*P_L) + (t_M*P_M) + (t_H*P_H) = T_L$ |
| State Medium | 3% | $(t_M*P_L) + (t_M*P_M) + (t_H*P_H) = T_M$ |
| State High | 5% | $(t_H*P_L) + (t_H*P_M) + (t_H*P_H) = T_H$ |

Regardless of where the firm writes policies, the firm's total premium taxes are lowest if it locates in the state with the lowest tax rate, a result due to the retaliatory tax. Therefore, this firm has an incentive to locate in the low-tax state so as to lower its tax liability nationwide.

If the firm does not write policies in the low-tax state, then the firm is indifferent between locating in the low-tax and the medium-tax state, but would still prefer either to locating in the high tax state. On the other hand, once located in the low-tax state, the firm has an advantage over foreign insurers writing policies in the low-tax state.[10] That is because the domestic firm would be subject to the low domestic rate and the foreign insurers would be subject to the higher retaliatory rates.

[10] This assumes, of course, the insurer is operating in more than one state.

The advantage depends on the difference between the domestic rate and the rate paid by foreign firms.

The situation is actually a bit more complicated than in the above example in that states can charge different tax rates for premiums written by domestic and foreign firms. Where there are differences, generally it is the case that the tax rate on foreign firms is greater than the tax rate on domestic firms, although some states, for example Utah, charge a higher tax rate on domestic firms.

The retaliatory tax is actually based on the tax the state imposes on foreign firms. Given the retaliatory nature of insurance taxation, a foreign firm pays the higher of the domestic tax rate and foreign tax rate in the state in which the premium is written, as shown in the example below. Thus, a firm domiciled in state A is charged the domestic tax rate on all premiums written in that state. However, for premiums written in state B, that firm pays the foreign tax rate in state B plus a retaliatory tax equal to the foreign tax rate in state A less the foreign rate in state B.

For example, assume Firm 1 is domiciled in State A and Firm 2 is domiciled in State B and that State A's premium tax on foreign insurance companies is greater than State B's tax on foreign insurance companies, i.e. $t_F^A > t_F^B$. If Firm 1 sells premiums in both states, then its tax liability is computed as follows:

$$T_1 = t_D^A P_1^A + [t_F^B + (t_F^A - t_F^B)P_1^B = t_D^A P_1^A + t_F^A P_1^B$$

Where $P_1$ is the value of premiums sold by Firm 1 in State A or B and $t_D^A$ represents the insurance premium tax on domestic companies in State A. From this example, it is clear that the domesticated state's foreign rate is a matter of interest to its own domestic companies. This is because when the domestic company sells policies in another state, its state's foreign tax rate is the minimum premium tax it will face in another state. From the example above, Firm 1 could lower its overall tax liability if its domesticated state foreign tax rate, $t_F^A$ , were lower.

## IV. Insurance Premium Tax Rates

Our focus is on the property-casualty (PC) industry, in part because it is possible to obtain information about the taxes paid by each insurer writing insurance in a state for this industry.[11] We constructed state-specific effective tax rates by dividing total direct taxes paid to state j by insurance companies domiciled in state j by premiums written in state j by insurance companies domiciled in state j. Total taxes include the premium tax less any credits. Thus, our tax variable reflects state-specific institutional provision of the premium tax.

We constructed state-specific effective domestic and foreign tax rates. The data come from the *National Association of Insurance Commissioners Annual Statement*, State Page. This dataset contains a state-by-state enumeration of premiums, losses, expenses, commissions, and taxes for each company writing business in a state in a given year. Specifically, the data contain the amount paid in a given year for premium taxes, licenses, and fees, as well as any credits received. Total net taxes are the sum of premium taxes, licenses, and fees less any credits. Thus, our tax variable reflects state-specific institutional provision of the premium tax. The effective domestic tax rates are calculated by dividing total direct net taxes paid to state *s* by property-casualty insurance companies domiciled in state *s* by premiums written in state *s* by insurance companies domiciled in state *s*. The foreign effective tax rate is similarly defined for companies chartered in states other than the state in question. That is, the foreign tax rate is the sum of total net taxes paid to state *s* by foreign firms divided by the premiums written in state *s* by foreign firms. Table 3 shows the effective domestic and foreign premium tax rates by state for the property-casualty industry for 2004; the mean domestic tax rate in 2004 was 2.3 percent while the average foreign rate was 2.6 percent.

[11] This level of detail for state taxes is not available for the life insurance industry.

**TABLE 3. STATE NOMINAL AND EFFECTIVE PREMIUM TAX RATES FOR PROPERTY/ CASUALTY LINES OF COVERAGE, 2004**

| | | Effective Tax Rate[2] | |
|---|---|---|---|
| **State** | **General Tax Rate[1]** | **Foreign** | **Domestic** |
| Alabama | 3.6% | 3.58% | 2.13% |
| Alaska | 2.70% | 2.71% | 3.05% |
| Arizona | 2.00% | 2.32% | 2.40% |
| Arkansas | 2.50% | 3.01% | 2.77% |
| California | 2.35% | 2.35% | 2.54% |
| Colorado | 2.00% | 1.80% | 1.04% |
| Connecticut | 1.75% | 2.33% | 2.27% |
| Delaware | 1.75% | 2.98% | 1.98% |
| D.C. | 1.70% | 4.02% | 1.61% |
| Florida | 1.75%****** | 2.59% | 2.43% |
| Georgia | 4.75%**** | 4.99% | 3.21% |
| Hawaii | 4.265% | 3.81% | 2.11% |
| Idaho | 2.50% | 2.90% | 1.42% |
| Illinois | privilege tax of 0.5%/0.4%** | 2.17% | 1.54% |
| Indiana | 1.30% | 1.83% | 0.41% |
| Iowa | 1.50% | 1.84% | 1.82% |
| Kansas | 2.00% | 1.95% | 1.44% |
| Kentucky | 3.00%**** | 3.14% | 0.21% |
| Louisiana | 2%*** | 3.39% | 2.42% |
| Maine | 2.00% | 2.86% | 2.73% |
| Maryland | 2.00% | 2.26% | 2.23% |
| Massachusetts | 2.28% | 2.70% | 2.88% |
| Michigan | taxed under Single Business Tax | 1.70% | 0.98% |
| Minnesota | 2.00% | 2.27% | 1.96% |
| Mississippi | 3.00% | 3.87% | 3.72% |
| Missouri | 2.00% | 2.08% | 1.76% |
| Montana | 2.75% | 2.96% | 3.64% |
| Nebraska | 1.00% | 1.84% | 1.83% |
| Nevada | 3.50% | 3.26% | 1.82% |
| New Hampshire | 2.00% | 2.93% | 3.70% |
| New Jersey | 2.10% | 2.54% | 1.26% |
| New Mexico | 3.03% | 3.11% | 5.48% |
| New York | 2.00% | 2.71% | 3.04% |

*Table 3 continues next page…*

**TABLE 3 (CONT). STATE NOMINAL AND EFFECTIVE PREMIUM TAX RATES FOR PROPERTY/ CASUALTY LINES OF COVERAGE, 2004**

| State | General Tax Rate[1] | Effective Tax Rate[2] Foreign | Domestic |
|---|---|---|---|
| North Carolina | 1.90% | 2.45% | 2.58% |
| North Dakota | 1.75% | 1.44% | 1.60% |
| Ohio | 1.40% | 1.75% | 1.62% |
| Oklahoma | 2.25% | 2.30% | 2.24% |
| Oregon | s.t. corporate excise tax on net income | 1.62% | 2.40% |
| Pennsylvania | 2.00% | 2.37% | 2.66% |
| Rhode Island | 2.00% | 2.48% | 3.73% |
| South Carolina | 3.25%**** | 4.17% | 4.72% |
| South Dakota | 2.50% | 2.44% | 1.72% |
| Tennessee | 2.50% | 2.79% | 0.92% |
| Texas | 1.60% | 2.02% | 1.76% |
| Utah | 2.25% | 2.65% | 7.28% |
| Vermont | 2.00% | 2.59% | 2.83% |
| Virginia | 2.25% | 2.68% | 2.76% |
| Washington | 2.00% | 2.12% | 2.06% |
| West Virginia | 3.00% | 4.03% | 0.81% |
| Wisconsin | 2% or income tax***** | 1.93% | 1.49% |
| Wyoming | 0.75% | 1.88% | 1.98% |

[1]Source: *Retaliation: A Guide to State Retaliatory Taxes, Fees, Deposits, and Other Requirements*. Volume 1, December 2005, National Association of Insurance Commissioners.

Note: The effective rates include all taxes licenses and fees and thus will differ from the nominal tax rate shown in the second column. Many states also subject premiums to an additional tax on a portion of premiums for the provision of fire services. In addition there may be additional taxes on marine insurance, workers compensation and for insurance sold by non-licensed carriers. These additional taxes along with the retaliatory tax will often raise the effective tax rate. States also have provisions which provide domestics (and in some cases foreign companies) with job credits or credits for investments made within the states. This will tend to reduce the effective rate from the nominal rate.

*The 2.3% rate applies to Life Insurance companies. Other lines face a tax rate of 1.6%.

**The 0.5% rate applies to all lines except Health. Health lines are subject to a tax rate of 0.4%. ***Tax is $140 for premiums less than $7,000 or less. Add $225 for each additional $10,000 or fraction thereof. **** Includes local premium tax. *****Applies to certain life insurance companies. ******Florida makes an additional assessment to pay for past hurricane losses covered by state cat fund.

[2]Author's calculations.

The states have different tax policies for foreign and domestic companies that lead to differences in tax rates between domestic and foreign companies. This is seen in the data in Table 3. The overall US average insurance premium tax rates are different between foreign and domestic companies. These differences in tax policy toward domestic and foreign companies can be as simple as a rate difference or a subtle as differences in credits. For example, Georgia nominally has the same tax rate for foreign and domestic companies, but it provides a lower rate for those companies that invest 75 percent of their assets in the state. Domestic companies are more likely to be able to invest 75 percent of their assets within the state to obtain a significant reduction in the tax rate than would foreign companies. This is, in part, because in Georgia local companies are relatively small and while there are some small foreign companies, most of the large ones would not be permitted (for prudential reasons) to invest 75 percent of their assets in any one state. Table 3 also illustrates the possible rationale for using the insurance tax system to attract companies to the state. Companies chartered in relatively high premium tax rate states will face a higher premium tax in relatively low tax environments.[12]

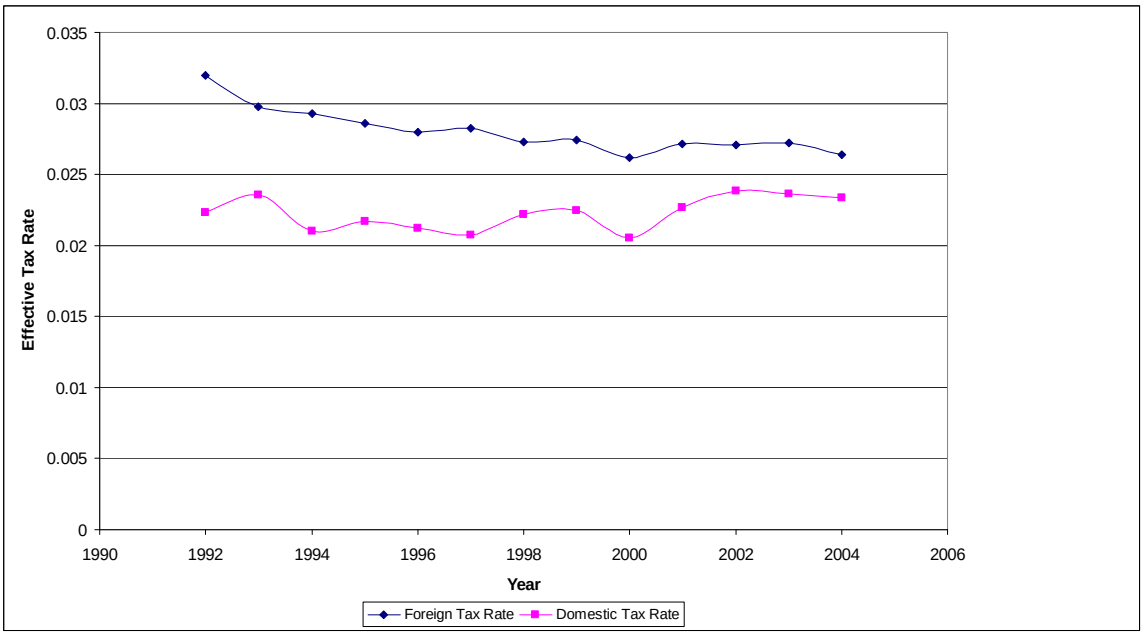
There is a substantial range of effective domestic tax rates. For 2004, the rates ranged from 0.21 percent to 7.28 percent, with a mean of 2.33 percent and median of 2.13 percent. Nearly half of the states have tax rates within 0.5 percentage points of the median. There is little correlation between the nominal and effective domestic tax rates; the correlation coefficient is 0.14. The range of the effective

[12] One other item to note is that the data underlying the effective tax rate includes premium taxes, retaliatory taxes, as well as other fees and assessments. The fees tend to be relatively small as they are charges for regulatory reviews and licenses. Assessments can be relatively large and occur when a bankrupt insurer has liabilities greater than its assets. In almost every state, the remaining insurers are assessed an amount based on market share to cover any shortfall caused by an insurer's bankruptcy. Some portion of this assessment each year is often deductible (or creditable) against the premium tax as a carry-forward. In addition, there are some other differences in state taxation that may lead to effective rates being greater or less than the nominal rates.

foreign tax rates is 1.44 percent to 4.99 percent, with a mean of 2.64 percent and a median of 2.54 percent. The correlation coefficient between the foreign and domestic effective rates is 0.296.

Figure 1 shows the pattern of the U.S. average foreign and domestic effective tax rates over the period 1992-2004. As can be seen, the effective foreign tax rate declined over the period, from 3.2 percent to 2.6 percent. The U.S. average domestic effective tax rate has fluctuated over the period, but there is no discernable trend. The effective foreign tax rate is larger than the effective domestic tax rate, but the difference has declined over the period.

**FIGURE 1. AVERAGE EFFECTIVE TAX RATE, 1992-2004**




Tables 4 and 5 compare the distribution by quintile for the 1992 and 2004 domestic and foreign effective tax rates tax, respectively. For the domestic tax rate, nearly 50 percent of the states were in the same quintile in both periods, while nearly an equal percentage where in higher and lower quintiles. For the effective foreign tax rate only 25 percent of the states were in the same quintile in both years, and a slightly greater percent of states had a higher tax rate in 2004 than in 1992.

**TABLE 4. TRANSITION FROM QUINTILE IN 1992 TO QUINTILE IN 2004, EFFECTIVE DOMESTIC TAX RATE**

| | | 2004 | | | | |
|---|---|---|---|---|---|---|
| | | **0** | **1** | **2** | **3** | **4** |
| **1992** | 0 | 5 | 1 | 2 | 0 | 1 |
| | 1 | 0 | 6 | 2 | 2 | 0 |
| | 2 | 4 | 2 | 2 | 2 | 0 |
| | 3 | 0 | 1 | 2 | 4 | 3 |
| | 4 | 0 | 0 | 2 | 2 | 8 |

**TABLE 5. TRANSITION FROM QUINTILE IN 1992 TO QUINTILE IN 2004, EFFECTIVE FOREIGN TAX RATE**

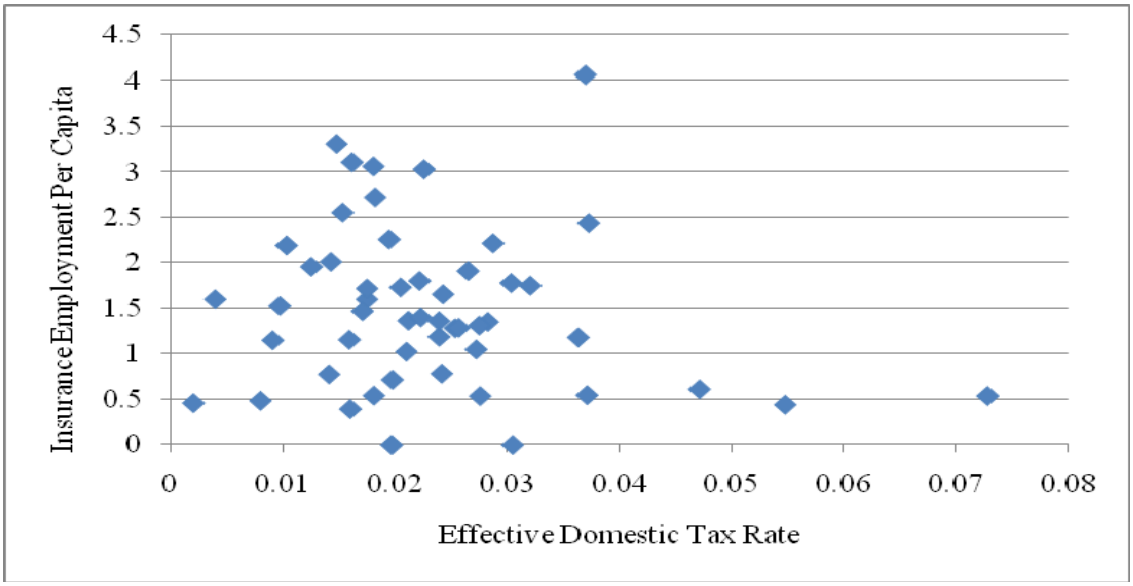
| | | 2004 | | | | |
|---|---|---|---|---|---|---|
| | | **0** | **1** | **2** | **3** | **4** |
| **1992** | 0 | 3 | 0 | 4 | 0 | 2 |
| | 1 | 1 | 3 | 0 | 2 | 4 |
| | 2 | 2 | 1 | 3 | 2 | 2 |
| | 3 | 0 | 1 | 1 | 4 | 4 |
| | 4 | 3 | 5 | 2 | 2 | 0 |

## V. Tax Rates and the Size of the State Insurance Industry

We compare tax rates to the employment in the property-casualty industry (excluding agents) in a state in a given year. These data come from the Bureau of the Census; we have a consistently defined series from 1992-2004. The series for PC employment is from the NAICS series 524126. The average state has 1.5 employees per 1,000 population.

Figure 2 shows how insurance employment per capita varies with the effective domestic tax rate. It is hard to see much of a pattern, and a simple regression produces a negative but statistically insignificant coefficient on the tax rate. Of course, this regression does not control for any of the other factors that might explain the variation in employment in the insurance industry across states. There are several states that have a low tax rate but low insurance employment per capita (for example, Wyoming, West Virginia, Idaho, and North Dakota), while a few have high tax and high employment (for example, New Hampshire, Rhode Island, and Massachusetts). We also ran a regression on the number of property-causality firms in a state against the effective domestic tax rate. Again the coefficient is negative but statistically insignificant.

**FIGURE 2. INSURANCE EMPLOYMENT AND EFFECTIVE TAX RATE**



We ran the same two regressions, but used the effective foreign tax rate. For these two regressions, the coefficients on the tax variable are both negative and statistically significant. However, the coefficients are very small, and imply an elasticity of employment per capita with respect to the tax rate that is very close to zero.

## VI. Regression Analysis

We turn now to a more complex regression analysis.

### Regression Model

We assume that employment in the insurance industry in each state is in equilibrium, and that equilibrium employment depends on factors that reflect demand and cost. Our regression model includes the effective domestic and foreign tax rates on insurance premiums, a set of variables that reflect the size of the insurance market in each state and relevant costs in each state, and state and time fixed effects. The state fixed effects control for state-specific differences in climate, raw materials, presence of metropolitan areas, and other factors that can cause output differences across states, and the time fixed effects control for time-specific, nationwide factors such as the business cycle, population, federal fiscal and monetary policy. The regression model is given by

$$E_{ts} = \beta_0 + \beta_1 T_{ts}^D + \beta_2 T_{ts}^F + \sum \beta_i X_{ts} + \nu_s + \mu_t + \varepsilon_{ts} \qquad [1]$$

where $E_{ts}$ is a measure of employment in the insurance industry in state $s$ in year $t$, $T^D$ and $T^F$ are the effective domestic and foreign insurance premium tax rates, $X$ is a set of variables measuring size of the market and cost factors, $\nu$ is a set of fixed state dummies, $\mu$ is a set of fixed time dummies, and $\varepsilon$ is an error term. We estimate equation 3 using ordinary least squares regression (OLS) and generalized least squares regression (GLS) but report only the OLS as the results are substantially similar. In addition, we employed lagged variables for the tax rates and found similar results.

### Data

Our data consists of a panel for the 50 states for each year 1992 to 2004. Our focus in this paper is on the property-casualty insurance industry, in part, because it is possible to obtain information about the taxes paid by each insurer writing insurance

in a state for this industry.[13] Over the time period of the sample there were a number (17) of state outliers. We excluded them if the effective domestic rate was greater than the 95 percentile of the distribution of the domestic tax rate. Most of the exclusions we believe are necessary because of specific states tax policies enacted to address short-term problems in the state. For example, Utah currently taxes workers compensation premiums at 7.75 percent but in the past it has been as high as 9.75 percent. This has an effect of raising the effective rate for the state. While the property and liability insurance industry is relatively homogenous and taxed in a similar way, we exclude Utah because of its particular tax policy on workers compensation. To test the robustness of these exclusions we also estimated the regressions using a "winsorized" effective tax rate. A winsor transformation is one which replaces distribution outliers with the value of the distribution at a given percentile. Thus, if the tax rate was less than the 5th percentile of the distribution of tax rates, the tax rate is set to the value of the $5^{th}$ percentile. In addition, if the effective tax rate was greater than or equal to the $95^{th}$ percentile, we set the tax rate at the value of the $95^{th}$ percentile to reduce the effect of outliers.[14] The results of the winsorized regressions are essentially the same as the results of the regression where we eliminated state outliers.

Table 6 shows the descriptive statistics for our variables for the year 2004. We have three main dependent variables. They are the employment in the property-casualty industry (excluding agents) in a state in a given year, the number of insurance agents employed in a state in a given year, and the share of national property-casualty employment in a given state in a given year. These data come from the Bureau of the Census; we have a consistently defined series from 1992-2004. The series for property-casualty employment is from the NAICS series 524126 and the insurance agents are from NAICS series 5242. One important item to note is that

[13] This level of detail for state taxes is not available for the life insurance industry as the State Page reports, while similar, do not contain state specific information concerning taxes paid.
[14] See Hanlon, Mills and Slemrod (2005) for an application of winsorized data.

**TABLE 6. SUMMARY STATISTICS FOR 2004**

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| Employment in Property Casualty Industry Per Capita | 1.521 | 0.882 | 0.000 | 4.060 |
| Agent Per Capita | 2.904 | 0.577 | 1.774 | 4.197 |
| Domestic Rate | 0.023 | 0.012 | 0.002 | 0.073 |
| Foreign Rate | 0.026 | 0.007 | 0.014 | 0.050 |
| Sales Tax Receipts per $ Million Personal Income | 0.037 | 0.012 | 0.009 | 0.063 |
| Domestic PC Market Share | 0.191 | 0.123 | 0.019 | 0.500 |
| Number of Domestic PC Companies | 40.940 | 42.715 | 1.000 | 178.000 |
| Number of Foreign PC Companies | 600.060 | 94.333 | 384.000 | 776.000 |
| Education Exp Per Million in Population | 2.228 | 0.341 | 1.656 | 3.494 |
| Health Exp Per Million in Population | 0.500 | 0.221 | 0.137 | 1.384 |
| Transportation Exp Per Million in Population | 0.544 | 0.242 | 0.332 | 1.860 |
| Welfare Exp per Million in Population | 1.156 | 0.334 | 0.627 | 2.140 |
| Average Agent Wage Per Capita | 0.048 | 0.010 | 0.031 | 0.074 |
| Property Tax Receipts Per Million in Population | 1.025 | 0.417 | 0.367 | 2.099 |
| Premiums Per 1000 Population | 23.666 | 4.546 | 17.437 | 43.693 |
| Share of National PC Employment in State | 0.020 | 0.023 | 0.000 | 0.093 |

N = 50.

agents may sell property-casualty and/or life and health products. Thus, while the other data is solely from the property-casualty industry, the agent data has all insurance agents included in the category. Our priors are that the number of agents in a state is driven by the size of the insurance market in the state and not by the premium tax rate.

Our control variables include several that reflect aspects of the property-casualty industry, including: the number of domestic property-casualty firms in the state; the number of foreign property-casualty firms that write policies in the state; the share of the market held by domestic firms; the domestic market share of multistate property-casualty firms, and; the market share of the largest firm.

In 2004, the average state had 1.5 employees in the property-casualty industry per 1,000 population and about 2 percent of the national property-casualty employment. Property-casualty premiums on a per capita basis were approximately

$2,400 while the average domestic property-casualty market share was just under 20 percent. The average state in 2004 had about 40 domestic companies and an additional 597 foreign companies operating in the state.

To control for the stringency of the state's regulatory environment we employ an indicator variable for whether the state regulates price changes with "prior approval" or allows companies to set prices subject to an *ex post* oversight of rates. Prior approval states require that the insurer submit its rates for approval from the regulator prior to their use in policy contracts. This prior approval indicator variable comes from Harrington (2002) and is a crude but commonly employed variable to describe the state's regulatory environment. We have no a prior hypothesis regarding the direction of the effect of regulation on employment. It could be that strict regulation reduces the output of insurers and this reduces the demand for labor. Or, it could be that strict regulation increases employment in order to better comply with the state's regulations.

To reflect cost differences across states we use the state average wage for insurance agents, obtained from BLS Wages and Salaries series on wages by area and occupation. We use this variable instead of wages from property-casualty insurance industry since some states have no domestic companies and thus no reported average wage for the industry.

Finally, we include a set of fiscal variables obtained from the Bureau of the Census, including state public expenditure on selected services and measures of property tax and sales tax burdens. We include education expenses per one million population, transportation expenditures per one million population, welfare expenditures per one million population, and medical expenditure per one million population. We also include as control variables sales taxes per million dollars of personal income and property taxes per million population.

## Results

Table 7 shows the results of the standard fixed effects OLS regression described in equation [1]; we included both state and year fixed effects but do not

**TABLE 7. TWO WAY FIXED EFFECT REGRESSION FOR EMPLOYMENT PER CAPITA IN THE PC INDUSTRY (T-STATISTICS IN PARENTHESES)**

| Variable | Coefficient | Elasticities |
|---|---|---|
| Intercept | **3.141** | |
| | (8.000) | |
| Domestic Tax Rate | **-3.504** | -0.046 |
| | (-2.190) | |
| Foreign Tax Rate | **-5.363** | -0.092 |
| | (-1.950) | |
| Number of Domestic PC Companies | 0.001 | 0.038 |
| | (0.850) | |
| Number of Foreign PC Companies | **-0.002** | -0.554 |
| | (-2.420) | |
| Domestic PC Market Share | 0.259 | 0.034 |
| | (0.830) | |
| Market Share of Largest Company within State | **-0.405** | -0.028 |
| | (-1.990) | |
| Domestic Market Share of Multistate Companies | **-0.091** | 0.018 |
| | (-1.630) | |
| Regulation Indicator | **-0.100** | -0.033 |
| | (-1.710) | |
| Average Agent Wage | **-10.345** | -0.244 |
| | (-2.450) | |
| Property Tax Receipts Per Million in Population | 0.083 | 0.035 |
| | (1.030) | |
| Sales Tax Receipts per $ Million Personal Income | 4.611 | 0.105 |
| | (1.510) | |
| Health Exp Per Million in Population | -0.101 | -0.023 |
| | (-0.810) | |
| Education Exp Per Million in Population | -0.100 | -0.100 |
| | (-1.090) | |
| Transportation Exp Per Million in Population | **-0.423** | -0.109 |
| | (-2.850) | |
| Welfare Exp per Million in Population | **-0.269** | -0.136 |
| | (-3.120) | |

N = 604.
R-sq: within =0.119; between =0.0051; overall =0.0071.

State and year fixed effects included but not shown.
Elasticities estimated at the mean.
State and year fixed effects included but not shown.
Coefficients in bold are statistically significant at $\rho < 10$ percent.

report their coefficients. In Table 7 the dependent variable is the per capita employment in the property-casualty industry within the state. (Agents are not included in these employment figures and are treated separately below.) The coefficients on both the domestic and foreign tax rates are negative, as hypothesized and statistically significant. The elasticity of employment per capita with respect to the domestic tax rate, evaluated at the means, is -0.046, while the elasticity with respect to the foreign tax rate is larger and equal to -0.096. These elasticities are much smaller than the range reported by Bartik (1992) and Phillips and Goss (1995). These results are insensitive to the choice of control variables.

We expect that employment should be more responsive to the foreign tax rate than the domestic tax rate. Consider a firm domiciled in a state with domestic tax rate $t^D$ and a higher foreign tax rate $t^F$. The firm will pay $t^D$ on premiums written in the state. To the extent that a higher $t^D$ makes marginal insurance policies unprofitable or raises prices and thus reduces the number of policies sold, we should expect a reduction in the premiums the firm writes in the state. This in turn should reduce the firm's employment within the state. A higher $t^F$ will make marginal insurance policies that the firm writes in other states unprofitable, which should lead to a reduction in employment within the state in which the firm is domiciled. Because the domestic share of premiums is small (on average it is about 18.8 percent (Table 6)), we would expect a larger employment response to an increase in $t^F$ than to an increase in $t^D$. But furthermore, the higher $t^F$ also provides an incentive for the firm to relocate to another state. Thus, we would expect the total reduction in employment from an increase in $t^F$ to be larger than the effect of an increase in $t^D$. Our empirical results are consistent with this expectation, i.e., the coefficient on the foreign tax rate is a substantially greater (in absolute value) than the coefficient on the domestic tax rate although the difference is not statistically significant. By using the elasticities we can calculate a 10 percent increase in the domestic rate for the average state would yield a loss of 39 jobs. A similar change in the foreign rate would yield a loss of 78 jobs for the average state.

To account for the fact that the states' two tax rates are correlated ($\rho$ =0.16), we also ran the regression in Table 7 dropping the domestic tax rate from the estimation. The coefficient on the foreign tax rate for that regression is somewhat larger (-6.361) and is still statistically significant.

We included several variables to control for the composition of the property-casualty insurance industry, only two of which are statistically significant. The number of domestic property-casualty firms in the state is positively related to employment per capita, but the coefficient has a very large standard error. This result is consistent with the positive sign on the coefficient for the share of the market (premiums written) held by domestic firms. But again, the coefficient is not statistically significant. The coefficient on the number of foreign property-casualty firms which write policies in the state is negative and statistically significant. If there is a large number of foreign firms this implies that much of the foreign firms' employment is in other states. Thus, the greater the number of foreign firms the less the domestic demand for insurance labor. Finally, the negative coefficients on the domestic market share of multistate property-casualty firms and the market share of the largest firm are consistent with larger firms having fewer employees relative to premiums written.[15]

We see that the average agent wage is negatively associated with per capita employment. This is to be expected as the higher labor costs would reduce the quantity of labor demanded, all other things equal. In addition, we see that a strict regulator environment is associated with lower employment within the state.

Finally, we also included several state-level fiscal variables. Generally these variables did not perform as expected, based on the findings in other studies. The coefficients on the property and sales tax variables are both positive, which is

[15] We also estimated regressions in which various combinations of these industry variables were excluded. We found that when the three market share variables (multi state market share, market share of the largest company within the state, and the domestic market share) were included in the regression all three were significant (or nearly so), but when one or two were left out the standard errors increased. It appears that these three measures of market share together measure the intricacies of the state market better than any single measure.

contrary to expectation, but not significant. We expected the coefficient on the education and transportation expenditure variables to be positive, but both are negative. Only the negative coefficients on the health and welfare expenditure variables have the expected negative sign, but only the later is statistically significant. One possibility for these results is that the insurance industry may not be as responsive to general fiscal conditions in the state as are other industries. This makes some sense as home owners insurance, workers compensation insurance, and automobile insurance likely have inelastic demands as they are either required by law (auto and workers compensation) or by mortgage lenders (home owners). Further, in 2006 these three lines accounted for over 63 percent of national property-liability premiums.[16]

A second measure of employment that we use is the number of insurance agents per capita. The results for this regression are found in Table 8. Recall that agents are the sales force for insurers and can be directly employed by an insurer to act as an agent within a state, operate as employees of a "franchise", or operate as agents of independent contractors. Further, they can sell any type of insurance for which they have a license, including property-casualty and life insurance products. Our results suggest that there is no significant tax effect (either foreign or domestic) on the number of agents per capita within the state. This result is not unexpected given the function of agents. The coefficient on the average agent wage is statistically significant and negative, as expected, but has a very small elasticity of approximately -0.003.

Table 9 shows the results for the regression where the dependent variable is the state's percentage share of the U.S. property-casualty employees. If we were using cross-sectional data, dividing state employment by total U.S. property-casualty employment would not change the regression results other than the scale of the parameters. With panel data, we should expect a similar outcome. One would

[16] Insurance Information Institute (2008).

**TABLE 8. TWO WAY FIXED EFFECT REGRESSION FOR AGENT EMPLOYMENT PER CAPITA IN THE INSURANCE INDUSTRY (T-STATISTICS IN PARENTHESES)**

| Variable | Coefficient | Elasticities |
|---|---|---|
| Intercept | **2.688** | |
| | (8.970) | |
| Domestic Tax Rate | -0.309 | -0.04 |
| | (-0.310) | |
| Foreign Tax Rate | 2.006 | 0.021 |
| | (1.190) | |
| Number of Domestic PC Companies | 0.001 | 0.069 |
| | (1.060) | |
| Number of Foreign PC Companies | -0.0003 | 0.002 |
| | (-0.520) | |
| Domestic PC Market Share | 0.273 | -0.099 |
| | (1.170) | |
| Market Share of Largest Company within State | **-0.553** | 0.021 |
| | -(3.560) | |
| Domestic Market Share of Multistate Companies | -0.018 | 0.021 |
| | (-0.420) | |
| Regulation Indicator | -0.021 | -0.054 |
| | (-0.470) | |
| Average Agent Wage | **-8.482** | -0.003 |
| | (-2.630) | |
| Property Tax Receipts Per Million in Population | **0.107** | -0.016 |
| | (1.750) | |
| Sales Tax Receipts per $ Million Personal Income | **0.005** | 0.081 |
| | (2.180) | |
| Health Exp Per Million in Population | -0.119 | -0.023 |
| | (-1.250) | |
| Education Exp Per Million in Population | **-0.166** | 0.027 |
| | (-2.350) | |
| Transportation Exp Per Million in Population | **0.529** | -0.037 |
| | (4.930) | |
| Welfare Exp per Million in Population | **-0.126** | -0.118 |
| | (-1.900) | |

N = 604.
R-sq: within =0.4621; between =0.0311; overall =0.0329.

State and year fixed effects included but not shown.
Elasticities estimated at the mean.
Coefficients in bold are statistically significant at $\rho < 10$ percent.

**TABLE 9. TWO WAY FIXED EFFECT REGRESSION FOR STATE'S SHARE OF NATIONAL EMPLOYMENT IN THE PC INDUSTRY (T-STATISTICS IN PARENTHESES)**

| Variable | Coefficient | Elasticity |
|---|---|---|
| Intercept | **0.061** | |
| | (9.400) | |
| Domestic Rate | -0.024 | -0.024 |
| | -(0.920) | |
| Foreign Rate | **-0.078** | -0.102 |
| | -(1.730) | |
| Number of Domestic PC Companies | 0.000 | 0.008 |
| | (0.130) | |
| Number of Foreign PC Companies | **-0.00006** | -1.690 |
| | -(5.910) | |
| Domestic PC Market Share | **0.015** | 0.147 |
| | (2.840) | |
| Market Share of Largest Company within State | -0.004 | -0.020 |
| | -(1.110) | |
| Domestic Market Share of Multistate Companies | **-0.002** | 0.029 |
| | -(2.140) | |
| Regulation Indicator | -0.001 | -0.028 |
| | -(1.140) | |
| Average Agent Wage Per Capita | -0.069 | -0.123 |
| | -(0.990) | |
| Property Tax Receipts Per Million in Population | 0.001 | 0.044 |
| | (1.040) | |
| Sales Tax Receipts per $ Million Personal Income | 0.016 | 0.027 |
| | (0.310) | |
| Health Exp Per Million in Population | -0.002 | -0.035 |
| | -(0.990) | |
| Education Exp Per Million in Population | -0.002 | -0.153 |
| | -(1.320) | |
| Transportation Exp Per Million in Population | **-0.004** | -0.083 |
| | -(1.730) | |
| Welfare Exp per Million in Population | **-0.003** | -0.118 |
| | -(2.170) | |
| N = 604. | | |
| R-sq: within =0.1377; between =0.0437; overall = 0.034. | | |

Elasticities estimated at the mean.
Coefficients in bold are statistically significant at $\rho = 0.1$ level.
State and year fixed effects included but not shown.

hypothesize that lower taxes might cause the distribution of the property-casualty industry employees in the U.S. to shift to those states with lower tax rates, all other things held constant. The coefficients on both of the two tax policy variables, the domestic and foreign tax rates, are negative, but only the coefficient on the foreign tax rate is statistically significant, and that at the 7 percent level with a two-tail test. One interesting negative result is that states had historically believed that they could keep foreign companies out by having a high tax rate. This was the real rational in setting a discriminatory tax on foreign insurers. Our results in Table 9 suggest that there is a negative relationship between the share of employment in a state and the foreign tax rate. The result suggests these discriminatory policies could reduce the share of employment in the industry in the discriminatory state. The U.S. Supreme Court in *Metropolitan v. Ward* invalidated these overt discriminatory taxes in 1985 just prior to the beginning of our data. Thus, the effects of overt discrimination are no longer significant at standard levels, but there is some weak evidence that the discriminatory policy reduced the share of employment in a state. Most of the coefficients on the other variables have the same signs and are significant as in Table 7.

Table 10 shows the results of the fixed effects regression where we employ per capita premiums as the dependant variable. Obviously this is not an employment variable, but it is included to provide some additional evidence on how taxes affect the state market for property-casualty insurance. We would expect that higher domestic or foreign tax rates will reduce the volume of premiums written in the state, and the empirical results for the foreign rate are consistent with this expectation. However, for the domestic rate we see that there is a positive relationship between the rate and the premiums per 1,000 in population. We examined a number of different specifications (including various interaction and quadratic terms) and the results seem robust. As a final robustness test we examined the difference between the foreign and domestic rates. This is shown in Model 2 of Table 10. Because for some states in our sample the domestic rate is greater than the foreign rate, we divide the difference variable into a positive difference variable for those states where the

**TABLE 10. TWO WAY FIXED EFFECT REGRESSION FOR PREMIUMS PER 1000 POPULATION (T-STATISTICS IN PARENTHESES)**

| | ---------Model 1--------- | | ----------Model 2-------- | |
|---|---|---|---|---|
| | **Coefficient** | **Elasticity** | **Coefficient** | **Elasticity** |
| Intercept | **13.768** | | **12.674** | |
| | (5.580) | | (5.220) | |
| Domestic Rate | **21.380** | 0.024 | | |
| | (2.130) | | | |
| Foreign Rate | **-49.646** | -0.074 | | |
| | -(2.880) | | | |
| Positive Difference Between Foreign and Domestic Rates | | | **-47.149** | -0.002 |
| | | | -(4.010) | |
| Negative Difference Between Foreign and Domestic Rates | | | 37.163 | -0.019 |
| | | | (1.460) | |
| Number of Domestic PC Companies | **0.025** | 0.061 | **0.024** | 0.061 |
| | (2.500) | | (2.340) | |
| Number of Foreign PC Companies | -0.004 | -0.119 | -0.003 | -0.119 |
| | -(0.960) | | -(0.670) | |
| Domestic PC Market Share | -1.901 | -0.022 | -1.209 | -0.022 |
| | -(0.970) | | -(0.610) | |
| Market Share of Largest Company within State | 1.106 | 0.007 | 1.108 | 0.007 |
| | (0.870) | | (0.870) | |
| Domestic Market Share of Multistate Companies | -0.376 | 0.006 | -0.450 | 0.006 |
| | -(1.070) | | -(1.280) | |
| Regulation Indicator | 0.081 | 0.002 | 0.093 | 0.002 |
| | (0.220) | | (0.250) | |
| Average Agent Wage Per Capita | 31.099 | 0.063 | 25.789 | 0.063 |
| | (1.170) | | (0.980) | |
| Property Tax Receipts Per Million in Population | 0.352 | 0.013 | 0.316 | 0.013 |
| | (0.700) | | (0.630) | |
| Sales Tax Receipts per $ Million Personal Income | 4.947 | 0.010 | 6.308 | 0.010 |
| | (0.260) | | (0.330) | |
| Health Exp Per Million in Population | 0.548 | 0.011 | 0.517 | 0.011 |
| | (0.700) | | (0.670) | |
| Education Exp Per Million in Population | -0.539 | -0.047 | -0.579 | -0.047 |
| | -(0.930) | | -(1.010) | |
| Transportation Exp Per Million in Population | **4.821** | 0.107 | **4.878** | 0.107 |
| | (5.190) | | (5.280) | |
| Welfare Exp per Million in Population | **1.387** | 0.060 | **1.354** | 0.060 |
| | (2.560) | | (2.520) | |
| N = 604. | | | | |
| R-sq. | 0.8658 | | 0.8671 | |

Elasticities estimated at the mean.
Coefficients in bold are statistically significant at $\rho = 0.1$ level.

difference is positive and a negative difference variable for those states where the difference is negative. The coefficient on the positive difference variable is negative, significant, and close in value to that of the foreign rate in Model 1, indicating that an increase in the difference reduces the aggregate value of premiums in a state. Thus, for premiums per capita it is the effect of the difference in rates that seems to matter rather than the absolute level of the rates. While the coefficient on the positive difference variable is of similar magnitude to the coefficient on the foreign rate in Model 1, its elasticity is very small, indicating that although the difference in the rates matter, the effect of that difference on premiums in a state is small. The coefficient on the negative difference variable was positive but not significant.

## VII. Summary and Conclusions

This report examined the effect of state taxation on employment in the property-casualty industry, a well defined industry with significant firm specific tax and operational information provided by insurance regulators. Together with state data on employment for direct employees of the insurance companies as well as complementary information for insurance agents, we were able to examine the effect of state tax policy on employment. We were further able to break down the tax paid by domestic and foreign companies operating within a state. While the tax base is similar for the states (gross premiums written) and the statutory rates are in a similar range, there are differences in effective tax rates across states.

We find that state tax policy has a significant effect on employment. We found evidence that a 10 percent increase in the domestic rate would cause a loss of about 39 jobs while a similar increase in the effective foreign rate would cause a loss of 78 jobs. For Georgia, the results imply that a one percentage point reduction in the domestic premium tax rate would generate 334 new jobs, while an equal reduction in the foreign premium tax rate would generate 525 new jobs.

The size of the employment changes appears relatively small. We undertook a number of robustness checks to see if the results changed. We employed other specifications of the domestic and foreign rates (i.e. the difference between the two rather than each separately). We also examined different specifications for the long-run dynamic panel and were not able to obtain different results.

Compared to studies of other industries, our estimates are small. It could be that the property-casualty insurance industry is simply less responsive to taxes than other industries. Since we have a well-defined industry and are able to measure the effective tax rate with high precision, our results could better reflect the effect of taxes on state employment than other studies.

One possible reason for the relatively small employment effect is that the demand for personal insurance is relatively inelastic. People are required to purchase homeowners insurance by their mortgage lenders. In addition, a minimum amount of

automobile insurance is required by each state. By themselves, the homeowners and personal automobile market account for approximately 54 percent of the premiums written nationwide. Thus, if the demand for the insurance is inelastic, the effect on firm's labor decision is likely to be small as the policy owners bear the major incidence of the tax. However, firms still have profit incentives to operate in lower tax environments due to the operation of the retaliatory tax.

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