Abstract - Recent research has shown that a state’s overall tax burden is dependent on that of neighboring states. By disaggregating a state’s tax burden into its individual components, this paper demonstrates that during the period of 1967–1996, state taxes with a mobile tax base had positive response rates as high as 60 percent. Thus, a 10 percent increase in neighboring states’ rates was met by an increase of up to 6 percent in the home state’s rate. Taxes with relatively immobile tax bases exhibit negative responsiveness, meaning that states respond to rate increases in neighboring states by decreasing home rates.

INTRODUCTION

“Give me $3 worth so I can get to Maryland.”

—a gasoline customer to a local service attendant in the District of Columbia (Richburg, 1980).

The quote above describes what was a common story in the District of Columbia after the city implemented a 6 percent gasoline tax in August of 1980. The tax raised gasoline prices by an average of 8 cents a gallon, causing many residents to cross the border into Maryland, where prices were lower. In the first 26 days of the tax’s existence, gasoline sales fell 27 percent in the District, resulting in lower revenues than had been expected (Richburg, 1980). The tax was repealed soon thereafter, replaced with a lower one–cent excise tax, which had a minimal impact on differentiating gasoline prices between the District and Maryland.

This historical example shows that the results of state policy can be impacted by actions that occur beyond the border. This experience, however, is not limited to the realm of gasoline taxes. New Hampshire, for example, has state sanctioned liquor stores located along Interstate 95 immediately over its borders with both Massachusetts and Maine, and has reminded Bostonians on local radio that the state has no sales tax as well. People are well aware of the lack of personal income taxation in Florida promoted by local authorities.

To date, most empirical research on tax competition has focused on the interdependence of property taxes set by local governments. The anecdotal evidence above is suggestive that tax competition is also alive at the state level. This paper adds to the literature by estimating the degree of inter-
dependence among five of the major tax instruments used by state governments. We find that for the time span 1967–1996, state taxes on motor fuel, tobacco, and corporate income, all of which have mobile tax bases, respond positively to rates set in neighboring states. Hence, tax rate increases in neighboring states are matched by a rate increase in the home state. However, state taxes with relatively immobile bases, such as the personal income tax and general sales tax, exhibit negative responsiveness. This means that decreases in neighboring tax rates were matched by an increase in the rate of the home state.

The remainder of the paper proceeds as follows. We begin by discussing earlier literature on interstate competition in the second section. The third section introduces a model highlighting the role of capital mobility within interstate tax competition. After describing the data, we explain the estimation procedure and discuss the results. The last section summarizes our main conclusions.

PREVIOUS RESEARCH

There are three main areas in which state policy may respond to the actions of other states: expenditure policy, program adoption, and taxation. On the expenditure side, an early area of work focused on the determination of state benefits for the program Aid to Families with Dependent Children (AFDC). Studies by Gramlich and Laren (1984), Peterson and Rom (1989), and Smith (1991) found support of a race to the bottom: states responded to benefit cuts in neighboring states with cuts of their own. These studies excluded the cases of n–state competition either by assuming neighbor benefits to be exogenously determined from own–state benefits or by looking at only bilateral interactions. Saavedra (2000), using techniques from the spatial econometrics literature to account for both these weaknesses, confirmed the finding of state interdependence of AFDC benefit setting.

AFDC expenditures are not the only area in which states may compete in expenditures, however. Case, Hines, and Rosen (1993) found that a one–dollar increase in neighboring state expenditures would raise own–state expenditures by 70 cents. These results remained strong once expenditures were disaggregated into separate categories such as education and highways. Using a different time span, Baicker (2001) finds that a one–dollar increase in expenditures will result in anywhere from a 33 to 88 cent increase in home expenditures depending on the definition of neighbor used.

Another large area of work has focused on the adoption of various programs and regulations. Alm, McKee and Skidmore (1993) found that after 1980, an important determinant of whether a state had adopted a lottery was whether or not a neighboring state had already implemented one. Anderson and Wassmer (1995) estimated hazard rates for the adoption of tax abatements among Michigan municipalities and found positive duration dependence. The authors used this evidence to conclude that cities were involved in a prisoner’s dilemma where abatements were offered as a way of evening the playing field. Brueckner (1998) performed a similar study on the adoption of growth control measures among California towns and found that cities were more likely to impose growth controls if their neighbors had also done so. Moreover, these cities implemented growth controls of the same intensity level as their neighbors. Fredriksson and Millimet (2002) found that in the case of state environmental policies, states would match the stringency levels of their policies to those of their neighbors.

With regards to the empirical work on tax competition, most work has focused on property taxes. Heyndels and Vuchelen (1998), Brueckner and Saavedra (2001) and Revelli (2001) found evidence of property tax competition among municipalities in Belgium, metro Boston, and the United Kingdom respectively. Outside of local
Coveting Thy Neighbors’ Taxation

property taxes, Buettner (2001) illustrated competition in Germany with regards to the tax local jurisdictions could place on business earnings. Finally, Besley and Rosen (1998) showed that states would respond to a change in federal gasoline taxes by raising state gasoline taxes. Goodspeed (2000, 2002) discovered a similar responsiveness between national and local income taxes among European states.

Case (1993) and Besley and Case (1995) argue that voters look to their neighboring states in order to get a sense of current economic conditions. If neighboring states are changing their tax rates, voters will be more accepting of a tax change because national trends seem to dictate such a reaction. Governors are well aware of this and are consequently more likely to adjust their tax rates when neighbors are adjusting theirs.¹ In empirically testing this conjecture, Besley and Case use a tax liability measure that is an aggregate of sales, corporate and personal income taxes paid as their measure of the tax rate; hence the authors say nothing about specific tax rates in a given state.

This paper disaggregates the Besley and Case tax measure into its individual components, illustrating that certain state taxes, especially excise taxes, are very much susceptible to competition. This finding may help explain why the relative importance of excise taxes within state tax structures has declined over time. For example, if states want forecasts of tax revenue to be accurate for purposes of budgetary planning, they may lower their reliance on competitive tax sources, leading to the structural trends in state taxation we now witness.²

TAX COMPETITION FOR STATES

The Basics

The mobility of capital plays a vital role in models of tax competition.³ In these models, capital flows between jurisdictions as it searches for the highest after tax rate of return. One way that a government can encourage capital inflow, therefore, is by lowering its tax on capital to a level below that of its neighbors. If the response of capital is elastic in nature, the jurisdiction will increase overall revenue despite the lower tax rate.

The problem with this logic, however, is that there is nothing to prevent other jurisdictions from undercutting the first tax change. Under the assumption of perfect mobility, meaning capital can traverse borders costlessly, the only equilibrium that can be maintained is the race to the bottom scenario in which both jurisdictions have tax rates of zero. Should a positive rate be chosen by one jurisdiction, the other will respond by lowering their rate by epsilon, thereby attracting all the capital.

The assumption of perfect mobility is problematic, however, as some capital incurs a cost of relocating. Hence, lowering a tax rate by a tiny bit may not entice capital movement, as the tax savings will not offset the costs capital owners incur by relocating. This effectively prevents jurisdictions from facing the “all or nothing” scenario above, as some capital will not find moving advantageous.⁴ There is still

¹ This notion of yardstick competition is a second avenue for state interdependence. For politicians, voters’ perception of a change in state taxation is likely to be as important as the fear of budgetary repercussions from direct competition. While the competition aspect should primarily affect mobile resources, the political aspect can affect immobile resources as well. Hence, different taxes may be affected differently.

² For a discussion of the structural tax changes that have occurred within the American South, see Rork (2003).

³ Models of tax competition are obviously richer than the abbreviated version we describe in this section. See Wilson (1999) for a thorough survey of the tax competition literature.

⁴ The lack of perfect mobility can also result in the granting of tax holidays, under which capital owners are offered a large tax break to entice them to locate in a particular state. The state then slowly raises tax rates over time, knowing that capital will be unable to recoup the costs of relocating again. See Doyle and van Wijnbergen (1994) and Bond and Samuelson (1986) for a more thorough discussion.
downward pressure on tax rates, but because all capital is not responsive, the equilibrium will result in positive tax rates for both jurisdictions.

**Mobility and State Level Competition**

In thinking about competition in different forms of state taxation, the key component remains mobility, although now the mobility is that of the corresponding tax base. If a tax is placed on a specific good, for instance, consumers may respond by searching out the area with the lowest tax–inclusive price. As the District of Columbia example illustrated, people are willing to cross the border for lower gasoline prices. It seems unlikely, however, that residents would consistently do all their shopping in another state to take advantage of a difference in a broader sales tax. Hence, a general sales tax may exhibit less responsiveness to changes in neighbors’ tax rates than an excise tax on a specific good. Essentially, the argument boils down to the demand for a specific good (e.g., cigarettes, gasoline) being more elastic than the demand for consumption in general.

Because people are often tied down to a particular state because of employment, one does not expect movement from one state to another on the basis of a change in the personal income tax. While the gain from such a move is lower income tax payments, these savings are likely offset by the costs of moving and the possibility of a longer commute, which would increase both the time and monetary costs of employees. Firms are perhaps more likely to move between states than residents, but a firm’s mobility is also limited by relocation costs that can range from those associated with finding new employees to building new factories. Thus, a competitive effect may exist in corporate taxation, but it is likely muted when compared to excise taxes, for example.

This discussion suggests that the degree of mobility of the targeted tax base will determine the degree of competitiveness, and hence excise taxes appear to be better candidates to exhibit tax competition than broad based tax instruments. This is borne out by Table 1, which reports the percentage share of tax revenue for each of the five tax instruments explored in this

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</tbody>
</table>

**TABLE 1**

AVERAGE SHARES OF STATE TAX REVENUE BY SOURCE AND YEAR

**SOURCE:** *State Government Finances, 1967–1996.*

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5 This assumes the individual remains employed at the same location.
Coveting Thy Neighbors’ Taxation

study.\textsuperscript{6} Table 1 reports the highest share across all states for the year indicated, as well as the average of all 48 mainland states for that year. The theory of tax competition predicts that if competition is present, revenue should decline over time. Thus, instruments with a decreasing share of overall tax revenue are candidates for finding tax competition.\textsuperscript{7} Motor fuel and tobacco exhibit steady declines in shares throughout the sample in both the average and maximum share, with motor fuel being the most pronounced. Personal income and general sales tax shares, on the other hand, demonstrate a steady increase over time, perhaps indicating that as certain state tax revenues are whittled away by competition, states respond by increasing their non–competitive, less responsive taxes. It is hard to conclude much from the movement of the corporate income tax share, as it increases and decreases during the period. However, the steady decline witnessed after the late 1970’s suggests that if competition in corporate income taxation was present, it did not take root until that time.

**Modeling the Impact of Mobility**

In order to illustrate how neighbors may influence a home state’s tax choice, we model the case of a state using a personal income tax\textsuperscript{8} in a spirit similar to Goodspeed (2002). For simplicity the paper focuses on the case of two states with an emphasis on the reaction function of state 1. We assume residents in both states have single–peaked preferences. Doing so allows us to invoke the median voter theorem, which implies that the government will satisfy the preferences of the median voter.

There are two goods in the model: \(X\), a private good, and \(G\), the per–capita level of a public good provided by the state. Assuming \(X\) and \(G\) are additively separable yields utility in the form of:

\[
U(X, G) = u(X) + v(G).
\]

Let \(y\) represent an individual’s private before–tax income, and \(Y\) represent total private income in state 1. The government of state 1 finances expenditures through a proportional income tax, \(t\). Hence:

\[
X = (1 - t) y.
\]

Individuals are allowed to move between states in response to a given tax rate. This mobility within the tax base implies that the state’s total income will depend on the tax rates of both states. Thus:

\[
G = tY(t, t'),
\]

where \(t'\) represents the income tax of state 2. The problem for the government is to choose the tax rate that maximizes the utility of the median voter subject to the budget constraint of the individual [2] and the government [3]. Substituting the constraints into the objective function [1] and maximizing yields a first order condition of:

\[
-\frac{\partial Y}{\partial t} + v_G \left[ Y + t \frac{\partial Y}{\partial t} \right] = 0.
\]

The term \(\frac{\partial Y}{\partial t}\) captures the degree of responsiveness of the tax base to the tax change. Should residents respond to tax changes by relocating, one would expect the sign to be negative, as higher taxes would induce people to locate to state 2.

\textsuperscript{6} We use the tax share measure as a first pass at looking into the erosion of the corresponding base. We ultimately focus on the responsiveness of the actual tax rate.

\textsuperscript{7} A state may lower its tax rate and receive higher revenue, hence resulting in a higher percentage share than seen previously. If there is truly downward competition occurring along this instrument, it should be the case that another state would undercut the first state, resulting in lower revenue. Thus, while an increase in percentage share is possible, it should be met by an eventual decrease if states are actually competing.

\textsuperscript{8} The model holds for other types of tax instruments; the personal income tax was chosen for simplicity.
Ultimately, we are interested in the impact of a change in state 2’s tax on the optimal tax of state 1. This can be achieved by differentiating [4] with respect to $t^*$:

$$
\nu_{GG}\left[ Y + t \frac{\partial Y}{\partial t} \right] + \nu_{2} \frac{\partial^2 Y}{\partial t^*} 
$$

As in Besley and Rosen (1998) and Goodspeed (2002), the slope of the reaction function with respect to $t^*$ can be either positive, negative, or zero. Note that if there is no mobility, equation [5] simplifies to zero as $\frac{\partial Y}{\partial t^*}$ will be zero. The remainder of the paper sets out to estimate the slope of the reaction function for state level taxes on different goods and types of income.

**DATA**

State financial data for this analysis has been compiled from various issues of *State Government Finances* for the years 1967–1996. We start with 1967 since prior to that year, various tax data (such as corporate income and personal income tax revenues) were aggregated together in some states. Using 1967 as a starting point has a nice historical advantage in that federal restrictions on industrial bond issuances were implemented at the same time. States involved in industrial recruitment efforts were forced to switch from the use of bonds to the use of tax policy as the basis of their recruiting efforts. By starting in 1967, the full impact of this switch in policy focus is captured.9 Ending in 1996 is also advantageous because federal government initiatives such as Temporary Aid for Needy Families (TANF), which have the potential to alter state finances, are not present.10

The financial data was matched with demographic information compiled from *The Statistical Abstract of the United States*. The end result is a data set containing thirty years of information for each of the 48 mainland states. The study focuses on five main categories of state tax revenue: personal income tax, corporate income tax, general sales tax, motor fuel tax and tobacco tax. These sources account for a large percentage of all state tax revenue in any given year during the sample.

**REGRESSION MODEL**

*Defining the Competition*

In order to model state tax competition, one must start by determining which states are competing with one another. The discussion in the previous section highlighted the importance of mobility within the tax base, suggesting that geography will play a large role in determining competitors. For example, individuals from Vermont are not going to drive to Utah to purchase gasoline, but they may travel to New Hampshire, Massachusetts or New York. Thus, bordering states appear to be the logical starting point.11

Once the bordering states for each state are identified, the next step is to assign weights in order to capture the relative importance one state may wield over another. This paper focuses on two common

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9 The federal restrictions on industrial bond issuances were implemented in part because the federal government was losing potential revenue. See Rork (2003) for a further historical discussion.

10 Obviously there are other federal policies, such as the Tax Reform Act of 1986, that will have an impact during the time period being investigated, and the estimation technique will account for these policy changes.

11 There is no reason to limit the definition of neighbors to geography, as non–contiguous states may also be competitors for other reasons. Case, Hines and Rosen (1993), for example, defined neighbors as those states with a similar racial composition. In using a spatial approach, however, there is no way to estimate what these weights would be, leaving the modeler to assign the structure of competition. Rather than impose a structure that may not exist, the paper limits itself to the geographic definition, which is the common definition in most studies.
approaches: contiguity weights and population–contiguity weights. A contiguity weight treats each bordering observation equally. In the example above, the observations from New Hampshire, Massachusetts and New York would get equal weight, as they are assumed to wield equal influence. The observation from Utah, on the other hand, would be given a weight of zero since Vermont and Utah do not share a common border. A population–contiguity weight still assumes that the relevant observations are only those that border the observation. In this case, however, weights are based on the overall populations of the bordering observations. Thus, New York would have a higher weight than Massachusetts, which in turn would have a higher weight than New Hampshire.

As is common in the literature, we use row–standardized weights, meaning the sum of the weights equals one. Thus, in the case of the contiguity weights for Vermont, each neighboring state would be given a weight of 1/3, as three states border Vermont. In the case of population–contiguity weights, one takes the bordering observation and divides it by the sum of the entire bordering population. Thus, New York’s weight would be its population divided by the sum of the populations of New York, Massachusetts and New Hampshire.

The Basic Modeling Framework

We follow Case, Hines and Rosen (1993) and assume that each state’s tax measure is a function of state characteristics ($X_{it}$) and the tax measure of its neighbor. Denoting $T_i$ to be the tax measure in state $i$ at time $t$ yields a linear relationship of:

$$ [6] \quad T_{it} = X_{it} \beta + \theta T_{jt} + \xi_i + \lambda_t + u_{it}, $$

where $T_i$ represents the neighbor’s tax rate, $\xi_i$ and $\lambda_t$ are state and year fixed effects, respectively, and $u_{it}$ is a mean zero, normally distributed random error. Since most states have multiple neighbors, we replace $T_{jt}$ by $\sum_j w_{ij} T_{jt}$, where $w_{ij}$ represents the weight assigned to state $j$. With simple contiguity weights, $T_{jt}$ is replaced by the average tax measure of the bordering states. With the population measure, $T_{jt}$ is replaced by a weighted average of bordering states. Since each state has a set of weights (which can be thought of as a 48x1 vector), equation [6] can be converted into a system of equations written as:

$$ [7] \quad T_{it} = \theta W T_{it} + X_{it} \beta + \xi_i + \lambda_t + u_{it}, $$

where $W$ is a weighting matrix assigning neighbors to every state.

The inclusion of $T_{it}$ on the right hand side of equation [7] means that estimation by OLS will be inconsistent, due to correlation with the error. We estimate equation [7] using the instrumental variables approach outlined in Kelejian and Prucha (1998) in which weighted values of the exogenous variables ($WX$) are used as instruments.13

Determination of Exogenous Variables

In order to conclude that interstate tax competition exists, it is important to
control for other factors that may precipitate changes in a state’s tax rate. These factors fall into three broad categories: fiscal, political and demographic. We discuss each of these categories in turn.

The first category is what Alm et al. (1993) describe as fiscal stress. Under this scenario, a state is forced to change its tax rate in order to make up for an unforecasted budget shortfall. To control for this scenario, measures of per capita outstanding debt, as well as per capita federal transfers, have been included. If federal transfers decrease, a state may have to raise taxes in order to make up for the foregone income. If a state has too much outstanding debt it may have to raise income in order to avoid a bond ranking crisis.14

A second argument is that the political environment plays a role in the determination of tax rates (Besley and Case, 1995). To control for this possibility, three variables are included. The first is a dummy variable for whether or not the year of observation was an election year in the state. Politicians may be less likely to raise a tax in the face of an election, and may be inclined to offer tax reductions if re-election was uncertain. We also include dummy variables indicating whether or not the governor and the majority of the state legislature are from the same party, as tax changes may be easier to implement if all political bodies are from the same political party since an air of cooperation is more likely. Moreover, with this variable we make the distinction between all political bodies being Democratic and all political bodies being Republican, as party affiliation may signal one’s willingness to change taxes.

Finally, state descriptive variables are also included. A state’s unemployment rate is added since states with high employment may be willing to adjust their tax rates in order to encourage job creation through firm relocation. Per capita income by state is included as it measures the general well being of a state’s residents while also controlling for potential income effects in consumption. The percent of a state’s population that is elderly (over age 65) is included because this represents a vocal and active population within a state’s electorate.

As mentioned above, the final specification also includes year and state fixed effects. The time effect controls for variables that affect all states in a given year, such as business cycle conditions. This will also address federal tax changes, which Besley and Rosen (1998) and Goodspeed (2002) found to play a role in state tax determination. State fixed effects are included to control for unobserved state characteristics, as well as history. For example, New Hampshire voters have a mindset of opposing sales taxation, whereas Oregon and Washington have historically adopted different tax structures. Including state fixed effects allow us to control for these important factors in the analysis.

Measuring the Tax

Finally, the dependent variable in the analysis is the state tax rate for each of the tax categories. The statutory rate for sales taxation (in terms of percentages), gasoline taxation (in terms of cents per gallon) and cigarette taxation (in terms of cents per package) are used. For both the corporate income tax and personal income tax, an average tax rate was created.15 For corporate income, corporate income tax revenues were divided by adjusted state GSP, which is simply state GSP with government expenditures and personal income subtracted.16

14 Massachusetts faced this situation in the early 1990’s.
15 Accounting for the deductibility of the state income tax at the federal level would make the measure closer to an effective tax rate, but given that this would involve additional assumptions on household structure and income, the average tax measure was used instead.
16 Ideally we would also like to net out investment income for corporations, but that data is unavailable at the state level.
In the case of personal income, the measure was all revenues collected from the personal income tax divided by personal income in the state.\footnote{In most models of tax competition, all capital in the state is assumed to face the same tax rate as there is no differentiation made between types of capital for tax purposes. Thus, the only method available to a state for altering its tax base is either to raise or to lower its tax rate. For certain types of taxes, such an assumption does not hold. For example, many states can alter their sales tax base by exempting necessities such as food and clothing. Similarly, changing the limits on income brackets allows states to change the tax base of income taxes. In situations like these, it may be the case that the use of one rate may not be the best means of capturing state competition. Thus, we re-estimated the model using tax shares for sales, personal income and corporate income taxation. Since the tax share measure is based on revenue, it better accounts for all the different manners in which a state may alter its tax base. The results using the tax share measure are consistent with those using the single rate. For brevity, we only report the results using the tax rate as the dependent variable.}

**RESULTS**

Table 2 reports results of the instrumental variables estimation for each of the five tax rates described in the previous section. Note that we include two sets of estimation results for each tax. The first column for each tax reports results using the contiguity weights. The second column reports estimates using population weights. Note that in general, the choice of weighting scheme brings little change to the results. We discuss each tax in turn. We tested the validity of the instruments for all five taxes under both weighting schemes. Although not reported in the text, both the Basmann and Sargan $N\times R^2$ overidentifying restriction tests support the choice of using weighted values of the exogenous variables as instruments for all specifications.

**Gasoline Taxation**

The results for per gallon gasoline taxes (in cents) are reported in column (2) of Table 2. As was the case for cigarette taxes, gasoline taxation appears to have a competitive element. The measure of competition is positive and statistically significant under both weighting schemes, ranging between 0.463 for the population weights to 0.600 with the contiguity weights. A large component of federal transfers to states is money earmarked for highway improvements. Since state motor fuel tax receipts are also often targeted for infrastructure improvements, the negative relationship between gasoline taxes and federal transfers indicates a degree of substitutability between the two revenue sources.\footnote{The recent experience in Massachusetts is a prime example. The federal government's reluctance to finance further cost overruns of the Big Dig has resulted in the Massachusetts legislature contemplating an increase in gasoline taxes to finance this shortfall.} The positive correlation with state debt suggests states are willing to turn to gasoline taxes in a time of fiscal increase of ten cents in neighboring states' cigarette taxes would induce a home increase between four and six cents. The results show cigarette taxes have a positive correlation with state per capita income and a negative correlation with the percentage of the population that is elderly. There is some evidence of cigarette taxes being substitutes for federal transfers, although the significance of the coefficient on per capita transfers is low. Both political parties are associated with higher cigarette taxes, although neither effect was statistically different from zero.

**Cigarette Taxation**

Column (1) in Table 2 contains the results using the per package state tax (in cents) imposed on cigarettes by states. Under both weighting schemes, the measure of competition is statistically significant, with the coefficient ranging from 0.416 under population weights to 0.636 with contiguity weights. Thus, an average
TABLE 2
INSTRUMENTAL VARIABLE ESTIMATION OF STATE TAX RATES

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<th>CIGARETTE TAX</th>
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<tr>
<td></td>
<td>Contiguity</td>
<td>Population</td>
<td>Contiguity</td>
<td>Population</td>
<td>Contiguity</td>
</tr>
<tr>
<td>neighboring states’ tax rate</td>
<td>0.636*** (0.050)</td>
<td>0.416*** (0.041)</td>
<td>0.600*** (0.059)</td>
<td>0.463*** (0.046)</td>
<td>0.048 (0.051)</td>
</tr>
<tr>
<td>percent of population 65 years or older</td>
<td>-56.094** (24.107)</td>
<td>-59.783** (23.474)</td>
<td>16.949 (11.921)</td>
<td>26.036 (12.343)</td>
<td>7.069*** (1.925)</td>
</tr>
<tr>
<td>state per capita income (in 1000's)</td>
<td>1.306*** (0.177)</td>
<td>1.507*** (0.168)</td>
<td>-0.225** (0.102)</td>
<td>-0.164 (0.108)</td>
<td>0.024** (0.012)</td>
</tr>
<tr>
<td>election year dummy (YES = 1)</td>
<td>-0.389 (0.294)</td>
<td>-0.424 (0.298)</td>
<td>0.021 (0.139)</td>
<td>0.033 (0.140)</td>
<td>0.027 (0.021)</td>
</tr>
<tr>
<td>same party-democrat</td>
<td>0.356 (0.310)</td>
<td>0.404 (0.324)</td>
<td>0.039 (0.153)</td>
<td>0.050 (0.160)</td>
<td>0.030 (0.024)</td>
</tr>
<tr>
<td>same party-republican</td>
<td>0.711 (0.489)</td>
<td>0.758 (0.487)</td>
<td>0.054 (0.189)</td>
<td>0.087 (0.189)</td>
<td>-0.017 (0.030)</td>
</tr>
<tr>
<td>state unemployment rate</td>
<td>0.288*** (0.098)</td>
<td>0.292*** (0.106)</td>
<td>-0.017 (0.050)</td>
<td>-0.056 (0.054)</td>
<td>0.012* (0.007)</td>
</tr>
<tr>
<td>state per capita federal transfers (in 1000's)</td>
<td>-4.442* (2.50)</td>
<td>-2.459 (2.242)</td>
<td>-6.595*** (1.337)</td>
<td>-5.934*** (1.364)</td>
<td>0.005 (0.016)</td>
</tr>
<tr>
<td>state per capita debt (in 1000's)</td>
<td>-0.112 (0.143)</td>
<td>-0.011 (0.210)</td>
<td>0.327* (0.180)</td>
<td>0.325* (0.189)</td>
<td>-0.018* (0.010)</td>
</tr>
<tr>
<td>constant</td>
<td>-11.725** (5.819)</td>
<td>-12.676** (5.484)</td>
<td>12.844*** (3.848)</td>
<td>12.634*** (3.865)</td>
<td>-0.672 (0.411)</td>
</tr>
</tbody>
</table>

All regressions contain state and year fixed effects.
*** significant at 99 percent level, ** significant at 95 percent level, * significant at 90 percent level. Standard errors in parentheses.
The adjusted R² ranges from a low of 0.69 for the corporate income tax to a high of 0.90 for the personal income tax.
trouble. There is also a positive relationship between gasoline taxes and the percent elderly, which likely stems from the fact that the elderly travel shorter distances by car than other segments of the population.

**Personal Income Taxation**

Column (3) in Table 2 illustrates the results for the personal income tax rate measure discussed earlier. The coefficient on the neighboring states’ personal income tax is negative, with estimates ranging from $-0.048$ to $-0.097$. This means that a 10 percent increase in neighboring states’ personal income tax rates would induce a home decrease of less than one percent. The lack of mobility in the tax base may explain this result. Only a small fraction of a state’s population may respond to a change in neighboring personal income tax rates by relocating; most individuals are likely to remain in their home state of residence. By recognizing the inelastic response of its residents, states can recover some of the revenue lost to relocation by simply raising personal income tax rates at home.

The positive relationship between personal income taxation and the percent elderly is consistent with the finding of Conway and Houtenville (2001), who argue that the elderly’s lack of wage income makes them more likely to lobby for high personal income taxes in lieu of other taxes. While insignificant, the coefficients on the political party dummies have their expected signs, with Republicans (Democrats) associated with lower (higher) personal income taxes.

**General Sales Taxation**

The results for the general sales tax rate are reported in column (4) of Table 2. Under both weighting schemes, the measure of competition is negative and statistically different from zero. The coefficients range from $-0.237$ to $-0.164$, meaning that a 10 percent increase in neighboring states’ sales tax rates would be met by an approximately 2 percent decline in the home state’s rate. As was the case with the personal income tax, it appears as though states are recognizing the lack of mobility in their sales tax base in order to maintain revenues.

The estimated coefficients of the control variables in the specification are as expected. Consumption has a positive income elasticity, hence it makes sense that states with high per capita income levels would have lower sales taxes, since the sales tax functions like a consumption tax. Both political parties are associated with higher sales taxes, although the Republican dummy is never statistically significant. Finally, sales taxes appear to be another substitute for federal money, as transfers from the federal government exhibit a negative relationship.

**Corporate Income**

Finally, column (5) of Table 2 reports the results for the measure of the corporate income tax. The estimated coefficient is the same under each weighting scheme: 0.16. Thus, a 10 percent increase in the average corporate income tax rate of one’s neighbors results in an increase of 1.6 percent at home. As expected, the political dummies work in opposite directions, with the Democrats raising and Republicans lowering corporate income taxes, although only the Democratic dummy is statistically significant. Since most of the elderly population are retired, the importance of a corporate presence is lessened. As a result, the elderly may lobby for higher corporate income taxes to replace taxes that impact them more directly.

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19 Note that the personal income tax is the only tax where the choice of weight matters, as the contiguity weights yield insignificant findings.
CONCLUSION

This paper began by arguing how the mobility of the tax base can impact whether a particular tax instrument is set competitively. Results indicate that taxes with relatively mobile tax bases respond positively to rates set in neighboring states. Response rates are found to range from 16 to 64 percent, meaning a 10 percent decrease in neighboring states’ tax rates would be matched by a decline of between 1.6 and 6.4 percent in the home state’s tax rate, depending on the tax in question. Taxes with relatively immobile tax bases, such as personal income taxation, are found to respond negatively. Moreover, the intensity of this response is muted when compared to the response of mobile taxes, as states are found to have response rates between 10 and 24 percent. Thus, a decrease in the rates of neighboring states of 10 percent would be met by an increase of the home state’s tax rate between 1 and 2 percent.

These results suggest that states relying heavily on excise taxes do so at their peril, as these tax rates and their corresponding revenue streams are most susceptible to erosion by neighboring actions. In order to ensure stable tax revenue, states will want to place more emphasis on those taxes that do not respond as dramatically to competition from beyond the border. These taxes will be characterized by a lack of mobility within the tax base. The inelastic nature of the tax base provides the state with the ability to raise tax rates and to generate additional tax revenue to offset revenue losses attributable to decreasing tax rates in neighboring states. Recent trends of increasing state reliance on personal income and sales taxation while decreasing state reliance on excise taxation are consistent with this portrayal.

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