Can Lower Tax Rates Be Bought?

Business Rent-Seeking And Tax Competition Among U.S. States

Robert S. Chirinko

and

Daniel J. Wilson*

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Abstract

The standard model of strategic tax competition – the non-cooperative tax-setting behavior of jurisdictions competing for a mobile capital tax base – assumes that government policymakers are perfectly benevolent, acting solely to maximize the utility of the representative resident in their jurisdiction. We depart from this assumption both theoretically and empirically by allowing for the possibility that policymakers, given the political and electoral environments in which they operate, also may be influenced by the rent-seeking (lobbying) behavior of businesses. In turn, businesses recognize the policymakers objective and may spend money on campaign contributions to influence tax policy. These changes to the standard strategic tax competition model imply that business contributions affect not only the levels of equilibrium tax rates but also the slope of the tax reaction function between jurisdictions. Thus, business contributions may either enhance or retard tax competition and hence the mobility of capital across jurisdictions.

We test these predictions by combining U.S. state panel data on capital tax policy and political preferences with newly-compiled state-level data on contributions made by businesses and other groups to candidates for state office. We document that the slope of the reaction function between tax policy in a given state and the tax policies of its competitive states is negative, a result implied by our theoretical model of profit-maximizing firms constrained by policymakers preferences for business contributions. We find little evidence that business contributions affect the slope of the reaction function. For our longer sample period, business contributions matter for tax policy, but the economic impact is very small. Aggregate factors (e.g., business cycle, inflation) play a very large role in determining state tax policies.

Robert S. Chirinko
Department of Finance
University of Illinois at Chicago
2333 University Hall
601 South Morgan (MC 168)
Chicago, Illinois 60607-7121
PH: 312 355 1262
FX: 312 413 7948
EM: Chirinko@uic.edu

Corresponding Author
Daniel J. Wilson
Research Department
Federal Reserve Bank of San Francisco
101 Market Street
San Francisco, CA 94105
PH: 415 974 3423
FX: 415 974 2168
EM: Daniel.Wilson@sf.frb.org

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> I wanted to thank all of you who contributed to Mitt Romney. You can't realize how much leverage this gives Huron going forward to ask various people for business.
>
> This is not about me trying to force a political candidate on you, … This is just business and the way business works.
>
> Gary E. Holdren, CEO, Huron Consulting Group, Inc. (email correspondence as reported in the *Wall Street Journal*, August 7, 2008, p. A4)

> Charles H. Keating Jr., the flamboyant developer and anti-porn crusader, needed help. The government was poised to seize Lincoln Savings and Loan, a freewheeling subsidiary of Keating's American Continental Corp.
>
> As federal auditors crawled all over Lincoln, Keating was not content to wait and hope for the best. He'd spread a lot of money around Washington, and it was time to call in his chits.
>
> *The Arizona Republic* (October 3, 1999)

INTRODUCTION

In a world of mobile capital, what factors determine business tax rates? The standard model of strategic tax competition assumes that government policymakers are perfectly benevolent, acting solely to maximize the utility of the representative resident in their jurisdiction. In this framework, business tax rates prevailing in a jurisdiction are heavily influenced by the tax policies pursued by its competitors. Apart from these strategic factors, tax rates may be influenced by the economic conditions and voters preferences within a state, as well as aggregate factors such as the business cycle and inflation.

However, as the quotations at the beginning of this paper remind, business campaign contributions are likely to be an additional influential factor on business tax rates. This paper explores the nexus between business contributions and business tax rates at the state level. While few executives are as explicit as Mr. Holdren and few politicians have received the attention of the "Keating Five," there is a pervasive belief that campaign contributions have a marked impact on policy decisions. We depart from the standard model of tax competition by allowing for this possibility in our theoretical model. Given the electoral and economic environments in which they operate, state policymakers are partly influenced by the rent-seeking behavior of businesses. In turn, businesses recognize the policymaker's objective and make campaign contributions to influence tax policy. These changes to the standard strategic tax competition model imply that business contributions may affect not only the levels of equilibrium tax rates, but also the slope of the tax reaction function between jurisdictions. Thus, business contributions may either enhance or retard tax competition and hence the mobility of capital across jurisdictions.

These predictions are examined by combining U.S. state panel data on capital tax policy and other relevant state-level economic and political variables with newly-compiled state-level data on contributions made by businesses and other groups to candidates for state office. The latter data are constructed from contribution-level records compiled by the National Institute for Money in State Politics (NIMSP). These records are required by law to be publicly disclosed and hence cover nearly all candidates for state office. From these records, we construct at the state level the total amounts of contributions by type of giver (business vs. non-business), type of office (e.g., house, governor), and type of candidate (e.g., winning, incumbent). These contributions are sizeable. During the 2003 to 2006 period, U.S. businesses contributed $1.5 billion, or nearly $5 per capita, to candidates for state offices. Of this $1.5 Billion, approximately 33% went to gubernatorial candidates (including lieutenant governor candidates), another 33% to state senate candidates, 21% to state house candidates, and the remaining 12% to candidates for other state offices (e.g., attorney general, state judges).

Our study of business contributions proceeds as follows. We begin by presenting a theoretical model in which the policymakers objective function depends on the utility of the representative citizen and the level of business contributions. The tradeoff between business contributions and tax rates is derived and then imposed as a constraint on firms choosing their level of business contributions to maximize profits. We extract the implications of optimizing behavior constrained by policymakers' objectives on tax competition and find that the slope of the reaction function can be positive or negative.

The next section discusses our state-level dataset consisting of three business tax variables – the corporate income tax rate, the investment tax credit rate, and the capital apportionment weight – and additional variables that determine business taxes and that serve as instruments. We also provide a discussion of the unique data on state-level campaign contributions.

Our empirical results are based on the reaction function that is standard in the tax competition literature – tax policy in a given state is related to tax policies in the competitive set of states and various control variables. We find that the reaction function is negatively sloped; that is, after accounting for aggregate time effects and economic and political variables at the state level, tax policy in a given state moves inversely with tax policy in the competitive states. This result holds for all three business tax policies that we analyze. To assess the role of business contributions, we augment the reaction function with business contributions to candidates for state office. We find no evidence that business contributions affect the level of business tax policy nor the slope of the reaction function.

All of these results are based on a sample period of 1997 to 2006, the period for which campaign contributions data are available continuously for nearly all states. The number of states with continuous contributions data drops sharply as one moves further back in time. Thus, we face a tradeoff when choosing the sample period in that a longer sample affords more observations and more within-state variation, crucial in a regression with state fixed effects. However, a shorter sample with a (nearly) balanced panel affords the usual advantages of weighting states equally and avoiding potential selection bias. When we estimate the model for the longer sample allowing for the maximum number of observations (1990 to 2006), business contributions emerge as statistically significant but economically unimportant.

Our empirical analysis concludes with a variance decomposition of the tax variables over both the short and long samples. As is usual in panel data models, state fixed effects and the unexplained residual play dominant roles. When these effects are removed from the variance decomposition, aggregate influences dominate, accounting for approximately 40% to 70% of the variation in tax variables. Of the variables that vary by state and over time, competitive states' tax policy generally proves most important. For the longer sample, business contributions play a large role for the investment tax credit and the capital apportionment weight, suggesting that contributions may have more influence on tax policies that are less salient to or noticed by the typical voter.

THE THEORETICAL MODEL AND THE ESTIMATING EQUATION

Policymakers Objective Function

This subsection analyzes the policymakers objective function and derives the tradeoff between tax policy and business contributions. We assume that the policymakers objective function (W[.]) depends on the utility of the representative resident (U[.]) and reflects benevolence or a concern for reelection. Resident utility is a function of private (C) and public (G) goods consumption and, as we shall see below, depends on tax rates and mobile capital affected by BC. However, in a departure from the standard tax competition model, we assume that W[.] also depends on the level of business contributions (BC) that have a direct impact by expanding the policymaker's personal consumption and an indirect impact by increasing the probability of reelection.[1] These considerations lead to the following specification of W[.] increasing in both arguments,

$$[1] \quad W = W\left[U[C,G],\ BC\right] \qquad W_U[.] > 0,\ W_{BC}[.] > 0 \ .$$
$$= W\left[U[C/G]*G,\ BC\right],$$
$$= W\left[G,\ BC\right],$$

where the second line follows from the assumption that U[.] is homothetic and the third line from normalizing U[C / G] to unity.

Government spending on public goods is financed by personal taxes (PT) and business taxes. The latter is assessed on taxable profits, defined as sales less borrowing costs, at a rate τ . Sales equal output, which is determined by a traditional neoclassical production function, F[K] , that depends on the capital stock (K). Hence, government spending can be express as follows,

---

[1] Equation [1] closely follows the formulation of the policymakers objective function in Edwards and Keen (1996, Section 2). In their model, the policymakers objective function depends on resident utility and "some item of public expenditure…which, while financed from general revenues, benefits only the policymaker…" (p. 118). Both their theoretical model and ours assumes that this objective function is the same for all policymakers. In our empirical work, this assumption is relaxed slightly, and we allow the objective functions to differ by state-specific constants.

[2] $G = PT + \tau * F\left[K[\tau, \tau^{\#}]\right] \qquad K_{\tau}[.] < 0,\ K_{\tau\#}[.] > 0.$

$= PT + LC[\tau] \qquad LC_{\tau}[.] > 0.$

In a world of mobile capital, the amount of capital available to firms is negatively related to the tax rate within a state (τ) and positively related to the tax rate prevailing in competitive states ($\tau^{\#}$). This dependency is represented in the first line of equation [2]. The interaction between the τ and the business tax base is, in effect, a Laffer Curve for business taxation. As is known from that literature, it is possible that an increase in the tax rate can lead to a sufficient reduction in the tax base such that tax revenues decline.[2] We do not entertain this extreme case and assume that the economy is on the upward sloping portion of the Laffer Curve. As indicated in the second line of equation [2], this assumption implies that $LC_{\tau}[.] > 0$.

Combining equations [2] and [3], we obtain the following specification of the policymakers objective function,

[3] $W = W\left[LC[\tau], BC\right].$

Totally differentiating equation [3] with respect to τ and BC and setting dW = 0, we obtain the following tradeoff between tax policy and business contributions,

[4] $d\tau / dBC = -W_{BC}[.] / \left(W_{U}[.] * LC_{\tau}[.]\right) < 0.$

Equation [4] is the marginal rate of substitution between τ and BC.

We summarize the above analysis with the following relation,

[5] $\tau = T[BC] \qquad T_{BC}[.] < 0.$

Equation [5] reflects a fundamental tradeoff facing policymakers – the benefits of an increase in

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[2] Our model focuses only on the revenue implications of taxation and does not consider allocative efficiencies that might result from tax changes.

business contributions is offset by lower tax rates, lower public consumption, and lower levels of citizen utility.

The Optimal Level Of Business Contributions

Firms that are considering making campaign contributions recognize the tradeoff faced by policymakers and optimize accordingly. Firm economic profit is sales less three costs – the profit tax assessed at rate τ, the opportunity cost of capital at a fixed rate ρ, and the cost of business contributions. Given its mobility, the amount of capital available to the firm depends directly on τ and hence indirectly on contributions. Thus, the sole choice variable available to firms is business contributions that benefit the firm by decreasing the tax rate on sales and increasing the flow of capital. These considerations, combined with the definition of taxable profits, lead to the following specification of economic profits (π),

$$
\begin{aligned}
[6] \quad \pi[BC] &= (1-\tau)*\left(F\left[K\right] - \rho*K\right) - BC \\
&= (1-\tau)*\left(F\left[K[\tau,\tau^{\#}]\right] - \rho*K[\tau,\tau^{\#}]\right) - BC \\
&= (1-T[BC])*\left(F\left[K[T[BC],\tau^{\#}]\right] - \rho*K[T[BC],\tau^{\#}]\right) - BC,
\end{aligned}
$$

where the substitutions in the second and third lines reflect capital mobility and the policymakers' tradeoff, respectively.

The optimizing firm chooses BC^{*} to maximize economic profits. Differentiating equation [6] with respect to BC and rearranging, we obtain the following first-order condition,

$$
\begin{aligned}
[7] \quad BC^{*} &= \left\{\tau*\left(F[K] - \rho*K\right)*\eta_{\tau,BC}\right\} + \left\{(1-\tau)*\left(F_K[K] - \rho\right)\right\}*K*\eta_{K,\tau}*\eta_{\tau,BC}, \\
\eta_{\tau,BC} &\equiv -(d\tau/dBC)*(BC/\tau) = T'[BC]*(BC/\tau) > 0, \\
\eta_{K,\tau} &\equiv -(dK/d\tau)*(\tau/K) > 0.
\end{aligned}
$$

Expenditures for business contributions yield two benefits. The direct benefit is the reduction in tax payments. As shown in the first term on the right-side of equation [7], this benefit equals the

the responsiveness of the tax rate to BC ($\eta_{\tau,BC}$) multiplied by the current tax payment ($\tau*(F[.]-\rho*K)$). The indirect benefit is the attraction of new capital. The value of an incremental unit of capital is positive because of a wedge between the net-of-tax marginal product of capital ($(1-\tau)*F_K[.]$) and the opportunity cost (ρ). In the traditional neoclassical model, these two objects would be equated. However, costly business contributions affect tax rates and mobile capital and prevent the equality. The resulting positive wedge is multiplied by the amount of capital (K), the responsiveness of capital to the tax rate ($\eta_{K,\tau}$), and the responsiveness the tax rate to business contributions ($\eta_{\tau,BC}$). Decreases in this latter elasticity decrease BC^* and, in the extreme case where policymakers place no value on business contributions, this elasticity and BC^* are zero. Lastly, note that $BC*$ is increasing in both current profits ($F[K]-\rho*K$) and incremental profits ($F_K[K]-\rho$). As profits rise, firms find it optimal to "buy" lower tax rates.

The Slope Of The Reaction Function

The first-order condition determining BC^* can also generate insights into tax competition. With mobile capital, in-state tax policies are influenced by out-of-state tax policies, and this relation is usually assessed in terms of a reaction function of a given states tax policy (τ) to that of its competitive states ($\tau^\#$). In terms of equation [7], an increase in $\tau^\#$ is equivalent to an increase in K. The slope of the reaction function, $d\tau/d\tau^\#$, can thus be inferred from $-dBC/dK$ computed from equation [7], where the minus sign accounts for the inverse relation between τ and BC.

The complete derivative for $-dBC/dK$ is complicated and tedious. However, the important implication for the reaction function can be ascertained by examining the explicit instances where K appears in equation [7]. This incomplete derivative is as follows,

$$[8] \quad \text{sgn}\left\{d\tau / d\tau^{\#}\right\} = -\text{sgn}\left\{dBC^{*} / dK\right\}$$

$$= -\left\{(1-\tau)*\left(F_{KK}[K]\right)\right\}*K*\eta_{K,\tau}*\eta_{\tau,BC}$$

$$-\left(\left\{\tau*\left(F_{K}[K]-\rho\right)*\eta_{\tau,BC}\right\} + \left\{(1-\tau)*\left(F_{K}[K]-\rho\right)\right\}*\eta_{K,\tau}*\eta_{\tau,BC}\right).$$

The second line is positive because of the diminishing returns associated with the production function. The increase in $\tau^{\#}$ leads to an inflow of capital and a fall in incremental profits. However, in contrast to this positive reaction, the third line is negative: as profits rise with the additional capital, firms find it optimal to lobby for tax cuts, which puts downward pressure on tax rates. Thus, the slope of the reaction function is ambiguous.[3]

The Estimating Equation

The above considerations suggest the following estimating equation for state i at time t,

$$[9] \quad \tau_{i,t} = \alpha\tau^{\#}_{i,t} + \beta x_{i,t} + u_{i,t},$$

where $\tau_{i,t}$ is a tax variable – either the investment tax credit rate, the corporate income tax rate, or the "capital apportionment weight" (explained below), $\tau^{\#}_{i,t}$ is the tax variable for the competitive states (the definition of competitive states is discussed in the next section), $x_{i,t}$ is a set of control variables, $u_{i,t}$ is an error term, and α and β are parameters to be estimated.

We expand equation [9] in six ways. First, the error term is assumed to have a two-way error components structure and equals the sum of a state fixed effects (ζ_i), a time fixed effects (ζ_t), and a random error ($\varepsilon_{i,t}$). Second, we include three variables to control for economic conditions: the investment to capital ratio ($IK_{i,t-1}$, which is lagged to avoid issues associated with simultaneity), the political preferences of state residents ($VOTERPREFERENCES_{i,t}$), and an indicator variable for whether there is a house election ($HOUSEELECTION_{i,t}$). These

[3] The ambiguous slope of the reaction function is a property of other tax competition models (e.g., Brueckner and Saavedra (2001), Chirinko and Wilson (2007b), and Mintz and Tulkens (1986).

variables are described in more detail in the next section. Third, the tax competition variable enters with contemporaneous and two lag values. Including lagged values allows for the possibility that capital mobility may be a gradual process taking more than one year. Fourth, to assess the role of business contributions on this tax competition model, we include $BC_{i,t}$ and $BC_{i,t-1}$ as additional regressors. The lagged value of BC is included here as a recognition of the fact that campaign contributions for a given election may be spread out over the two years leading up to the election. Fifth, we recognize the possibility that the contemporaneous values of $\tau^{\#}_{i,t}$ and $BC_{i,t}$ are endogenous and estimate the model by GMM. The instruments for $\tau^{\#}_{i,t}$ are variables indicating the political preferences of voters in the competitive states and vary by the tax policy being estimated (they are described below). The instruments for $BC_{i,t}$ are state campaign contribution limits, the number of candidates running for office, a measure of the funding competitiveness of races within the state, and the amount of non-business campaign contributions. Based on these considerations, the following equation is the basis for the estimates reported in this paper (where a ^ over a contemporaneous variable indicates that it is instrumented),

$$
\begin{aligned}
[10]\quad \tau_{i,t} = {} & \zeta_i + \zeta_t + \alpha_0 \hat{\tau}^{\#}_{i,t} + \sum_{k=1}^{2} \alpha_k \tau^{\#}_{i,t-k} \\
& + \beta^{IK}\, IK_{i,t-1} + \beta^{VP}\, VOTERPREFERENCES_{i,t} + \beta^{HE}\, HOUSEELECTION_{i,t} \\
& + \gamma_0 \widehat{BC}_{i,t} + \gamma_1 BC_{i,t-1} \\
& + \delta_0 * \hat{\tau}^{\#}_{i,t} * (\widehat{BC}_{i,t} + BC_{i,t-1}) + \delta_1 * \hat{\tau}^{\#}_{i,t-1} * (\widehat{BC}_{i,t} + BC_{i,t-1}) + \delta_2 * \hat{\tau}^{\#}_{i,t-2} * (\widehat{BC}_{i,t} + BC_{i,t-1}) \\
& + \varepsilon_{i,t}
\end{aligned}
$$

$$
\alpha \equiv \sum_{k=0}^{2} \alpha_k , \quad \gamma \equiv \sum_{k=0}^{1} \gamma_k
$$

The impact of the tax competition and business contributions variables is assessed by the sum of the α's and γ's, respectively.

The BC variables can affect the slope of the reaction function in two ways. The estimated α's could be biased by an omitted variables problem if the $BC_{i,t}$'s are incorrectly omitted from equation [10]. More directly, the terms capturing interactions between the $\tau^{\#}_{i,t}$'s and the $BC_{i,t}$'s will alter $d\tau / d\tau^{\#}$ if the δ's prove significant.

THE PANEL DATASET

This section briefly describes the construction of the data used in this study. The series are for the 48 contiguous states and extend from 1988 to 2006. Details concerning the construction and data sources for the series discussed in this section (with the exception of the data on business contributions and capital apportionment weights) can be found in the Data Appendix to Chirinko and Wilson (forthcoming).

The three state tax policies are considered in this study and are referred to in general as $\tau_{i,t}$. The effective corporate income tax rate at the state level ($CIT_{i,t}$) is lower than the legislated (or statutory) corporate income tax rate due to the deductibility (in some states) against state taxable income of taxes paid to the federal government. Some states allow full deductibility of federal corporate income taxes from state taxable income; Iowa and Missouri allow only 50% deductibility; and some states allow no deductibility at all. In some states, the legislated state corporate income tax rate varies by income and is measured by the marginal legislated tax rate for the highest income bracket.

The effective federal corporate income tax rate needed to calculate $CIT_{i,t}$ is lower than the legislated federal corporate income tax rate due to the deductibility against federal taxable income of taxes paid to the state. It has not generally been recognized that, owing to deductibility of taxes paid to another level of government, the effective corporate income tax rates at the state and federal levels are functionally related to each other. These interrelationships yield two equations in two unknowns, and thus can be solved for the effective corporate income tax rates at the state and federal levels.

The state investment tax credit ($ITC_{i,t}$) is a credit against state corporate income tax liabilities. In general, the effective amount of the investment tax credit is simply the legislated investment tax credit rate multiplied by the value of capital expenditures put into place within the state in a tax year. The effective rate is lower than the legislated rate in a handful of states for two reasons. First, five states (Connecticut, Idaho, Maine, North Carolina, and Ohio) permit the state investment tax credit to be applied only to equipment. Second, states generally require basis adjustments deducting the amount of the credit from the asset basis for depreciation purposes. In some states, the legislated investment tax credit rate varies by the level of capital expenditures; we use the legislated credit rate for the highest tier of capital expenditures.

The capital apportionment weight ($CAW_{i,t}$) is the weight that the state assigns to capital (property) in its formula for apportioning income among the multiple states in which a firm generates income. Every U.S. state that taxes corporate income uses “formulary apportionment” to instruct firms that operate in multiple states on how to allocate their national (federal) taxable income to that state. The apportionment formula is in all cases a weighted average of the company’s sales, payroll, and property, though the weight on one or more factor can be and often is equal to zero. The weights in this formula vary considerably by state. Over the last 30 years, states have increasingly moved toward increasing the weight on sales and decreasing the weights on payroll and property as a way to encourage job creation and investment in their state and “export” the tax burden to out-of-state business owners that sell goods and services in-state but employ workers and capital out-of-state (Wilson, 2006). The capital apportionment weight can be thought of as a capital tax instrument with somewhat similar effects as the corporate income tax. Data on $CAW_{i,t}$ are obtained from historical state tax forms available from state tax departments.

The investment to capital ratio ($IK_{i,t}$) is real investment expenditures in equipment (excluding software) and structures divided by the constant-dollar replacement value of the capital stock for the manufacturing sector (NAICS sectors 31 to 33). The capital stock series is computed according to a perpetual inventory based on real investment expenditures, a depreciation rate, and an adjustment to the initial value for book value and inflation.

The political preferences of state residents ($VOTERPREFERENCES_{i,t}$) are defined by the extent to which Republicans control the state government: 0.0 if they control neither the legislature nor governorship, 0.5 if they control only the legislature or only the governorship, and 1.0 if the they control both the legislature and governorship.

The $HOUSEELECTION_{i,t}$ variable is an indicator variable taking a value of 1.0 for years during which an election to the House is held, 0 otherwise.

The competitive states tax policy ($\tau^{\#}_{i,t}$) is an important variable in our analysis and is defined as a weighted-average of the tax policies prevailing in the other 47 continental states. This weighted-average formulation can be interpreted as a spatial lag on $\tau_{i,t}$. The weights reflect the "competitive closeness" of the other states as measured by the inverse distance between the population centroids for a given state and that of each of the other 47 continental states. The weights are normalized to sum to unity. (Note that alternative definitions of "closeness" restricted to bordering states or based on trade flows will be considered in a subsequent draft.)

A unique data source used in this paper is the business contributions data defining $BC_{i,t}$. These data are for contributions made by businesses and other groups to candidates for state office. These latter data are constructed from contribution-level records compiled by the National Institute for Money in State Politics (NIMSP). Details of the construction of these data are provided in Appendix A. Several $BC_{i,t}$ variables are available for this study. In this first draft, we restrict our attention to business contributions made to candidates for the state house (assembly) because of our a priori belief that revenue bills will tend to be initiated in this legislative chamber and because house elections take place at a greater frequency (every two years) in general than senate or gubernatorial elections. The $BC_{i,t}$ variable is the logarithm of business campaign contributions made to candidates for the state house (assembly) per capita.

The instrumental variables for predicting $\tau^{\#}$ in the GMM estimation (discussed in the subsection *The Estimating Equation*) are drawn from the following list of eight candidate variables based on voter preference variables for competitive states:

(a) the governor is Republican (R). (The complementary class of politicians is Democrat (D) or Independent (I). An informal examination of the political landscape suggests that Independents tend to be more closely aligned with the Democratic Party. We thus treat D or I politicians as belonging to the same class, DI);

(b) the majority of both houses of the legislature are R;

(c) the majority of both houses of the legislature are DI;

(d) the governorship changed last year from R to DI;

(e) the majority control of the legislature changed last year from D or split (between houses) to R;

(f) an interaction between the R governor and the R legislature indicator variables;

(g) an interaction between R governor and the D legislature indicator variables (note that the omitted interaction category is R governor and a split legislature dummy);

(h) the reelection of an incumbent governor last year.

Each of the three tax policies we consider has a different subset of the above variables as its set of instrument variables. The subset for each tax policy is that used in Chirinko and Wilson (2007b), which were selected in that paper based on an optimal instrument search algorithm that, conditional on instrument validity, searches over all combinations of the above instruments to maximize instrument relevance. In future drafts of this paper, we intend to repeat such a search for the data and sample period used in this paper.

The instrumental variables for predicting business contributions are as follows,

(a) the level of campaign contribution limits (CCLs) for corporations to house candidates in that state;
(b) the number of candidates that ran for a state house seat
(c) the ratio in the state of non-business contributions to house candidates that go on to win their race ("winning candidates) to non-business contribution to losing state house candidates;
(d) the ratio in (c) squared;
(e) the level of non-business campaign contributions to house candidates in the state.

(In a future draft, these instruments will also be selected according to an algorithmic search that, conditional on instrument validity, maximizes instrument relevance.)

Summary statistics for the business contributions, tax policy variables, and control variables are presented in Table 1. There are at least three notable items. First, business contributions for house candidates, which is the $BC_{i,t}$ series we use in this draft of the paper, exhibits a good deal of variation, as the standard deviation exceeds its mean, yet has zero values for more than 50% of observations. This predominance of zeros is driven in part by the large number of state-years, mostly off-election years in the state, in which there are no business contributions; see the data in columns 3 and 4. Second, among the tax variables, $ITC_{i,t}$ has the most variation. Third, the averaging underlying the definition of the competitive state tax policy variables has a substantial effect in reducing the variation in these variables relative to their in-state counterparts.

EMPIRICAL RESULTS

Tax Competition

OLS and GMM estimates of the standard tax competition model, defined in equation [10] with the effect of $BC_{i,t}$ removed by setting the γ's and δ's equal to zero, are presented in Table 2. We begin with the OLS estimates in columns 1 to 3. The sum of the coefficients on the competitive states tax policy, α, is negative and, as assessed by the p-values presented in braces, statistically significant at the 10% level. That is, the reaction function, $d\tau_{i,t} / d\tau^{\#}_{i,t}$, is negatively sloped. However, tax competition among states necessarily implies that there will be a correlation between the error term and $\tau^{\#}_{i,t}$ leading to inconsistent estimates. The OLS estimates assumed that $\tau^{\#}_{i,t}$ is exogenous, and hence, these OLS estimates must be viewed cautiously. An instrumental variable estimator is required.

Comparable GMM estimates are presented in columns 4 to 6. The instruments used vary by tax policy and are listed in the Note To Table 2. The point estimates of the α's are only a bit lower for $CIT_{i,t}$ and $CAW_{i,t}$ and approximately halved for $ITC_{i,t}$. Both $CIT_{i,t}$ and $ITC_{i,t}$ remain statistically significant at the 10% level, but $CAW_{i,t}$ is no longer estimated precisely. The latter result may be explained by the quality of the instruments. While the instruments for each tax policy variable appear valid, as indicated by the high p-values for the J statistic, they do not appear relevant for $CAW_{i,t}$. The eigenvalue statistic of 0.370 is well below the critical value of 10.9, and this instrument weakness problem may be responsible for the imprecise estimates of α for $CAW_{i,t}$.

As an aside, we note that of the three control variables, only $VOTERPREFERENCES_{i,t}$ has a statistically significant effect. Interestingly, the estimates imply that Republican controlled governments tend to raise $CIT_{i,t}$ and lower $ITC_{i,t}$, results that are not consistent with the usual view of Republican administrations being more favorably disposed toward business. As we shall see, this is a robust result in all of the models presented in the tables.

In sum, the results from Table 2 confirm the importance of tax competition in determining business tax policy and indicate that the slope of the reaction function is negative.

The Incremental Role of Business Contributions

The impact of business contributions is assessed in the GMM estimates in Table 3. The $BC_{i,t}$ variable is treated as an exogenous variable in columns 1 to 3 and as an endogenous variable in columns 4 to 6. Note that the coefficients on $BC_{i,t}$ and $BC_{i,t-1}$, and their sum, have been multiplied by 1000 in Table 3 to facilitate presentation. Two robust results emerge. First, the impact of business contributions on business tax policy is negligible. The sum of coefficients on the current and lagged values of the business contributions variable (γ) does not differ significantly from zero, either statistically or economically. Second, as might be expected given this result, the impact on the slope of the reaction function is also negligible.

Table 4 expands the model further by allowing for interactions between business contributions and the competitive states tax policy. To conserve on degrees of freedom, we constrain the interaction coefficients with $BC_{i,t}$ and $BC_{i,t-1}$ to be the same. There is little evidence of a statistically significant impact of the business contributions variables on tax policy. Moreover, the instruments appear to be very weak, and the α's are now estimated very imprecisely.

Longer Sample

The results in Tables 2 to 4 are based on a sample period of 1997 to 2006, the period for which campaign contributions data are available continuously for nearly all states. While the nearly balanced sample has the advantages of weighting states equally and avoiding potential selection bias, it affords limited within-state variation with which to identify the effect of state- and time-varying variables such as business contributions. Thus, we explore the sensitivity of our results to a longer sample. Table 5 presents estimates of a very restricted version of equation [10] in which only the current and lagged value of the business contributions variable enter, along with state and time fixed effects and a control variable for years in which a house election occurs. Panel I contains OLS and GMM results in columns 1 to 3 and 4 to 6, respectively, for the short sample defined from 1997 to 2006. For all six equations, business contributions do not affect tax policy.

Panel II of Table 5 repeats the exercise for the years 1990 to 2006. This is the longest sample that can be constructed from the NIMSP business contributions data. For this longer sample, the GMM estimates are statistically significant and of the correct sign, as business contributions appear to lower $CIT_{i,t}$ and $CAW_{i,t}$ and raise $ITC_{i,t}$. However, the economic significance is tiny. The largest coefficient sum (γ) in column 6 is about −0.0068 (recall the BC coefficients are multiplied by 1000 in the tables) for either of the regressions with $CAW_{i,t}$ as the dependent variable. This value implies that a 10% increase in business contributions to house candidates would lead to a decrease in the capital apportionment weight of just 0.07 percentage point; that is, a decrease for a 33.00% to a 32.93% capital apportionment weight.

Given the significance of business contributions for the longer sample, Tables 6 and 7 reestimate models presented in Tables 2 and 3 for the period 1990 to 2006. For our preferred GMM estimates in columns 4 to 6, the α's decline sharply for $CIT_{i,t}$ and $ITC_{i,t}$ and in both cases are no longer statistically significant. However, the coefficient sum becomes substantially larger (in absolute value) and statistically significant for $CAW_{i,t}$. These results for the longer period may be traceable to the greater variability of $CAW_{i,t}$ in the earlier part of the sample, as many states were decreasing this weight in their apportionment formulas.

Table 7 presents models with both tax competition and business contributions as explanatory variables. Relative to the results in Table 3 for the shorter period, the results are mixed. The α's for the $CIT_{i,t}$ and $ITC_{i,t}$ fall in absolute value and are no longer statistically significant. As in Table 6, the α's for $CAW_{i,t}$ become larger in absolute value. Consistent with the results in Table 5, the γ's, the sum of the coefficients on $BC_{i,t}$, are of the correct sign and more precisely estimated. All of these results must be viewed carefully, as the eigenvalue statistic indicates that the instruments are generally weak over this longer sample period.

Biennial Data

The nature of the reporting of campaign contributions may affect the results. Since most states only report contributions at a two-year, electoral-cycle frequency, it is not known how contributions are divided among the two years within a cycle. If non-election-year contributions are generally zero, then the appropriate way to handle the data is to assign all of the contributions for the cycle to the election year and assume unreported contributions are 0 in non-election years. In this case, the data set remains at an annual frequency for the purposes of our regression analysis. However, if contributions generally are made in both years of the cycle, then it is not possible to measure contributions at an annual frequency to match the annual frequency of the other variables in our regression model. In this case, all of the variables in the model should be converted to a biennial frequency, using their 2-year sums (or annual averages) over each 2-year electoral cycle as their biennial values.

Since we do not know which of these two scenarios is appropriate, we reestimate all of the models presented in Tables 1 to 7 with the biennial data; that is, data for which a "year" is two calendar years. The results are presented in Appendix B and are generally less precisely estimated than those with annual data discussed previously.

Variance Decomposition

An alternative way to assess the impact of factors determining business tax rates is to decompose the variance of $\tau_{i,t}$ into the variances of the explanatory variables. We follow the standard ANOVA procedure and set the covariances between explanatory variables to zero. For ease of exposition, we then adjust the variance of $\tau_{i,t}$ by removing the effects of these covariances; this allows the entries to sum to 100%.

Variance decompositions are presented in Table 8 for each of the three tax policies and for both the short and long sample periods. As is usual in panel data models, state fixed effects and the unexplained residual play dominant roles. Columns 1 to 3 show that 79% to 98% of the adjusted total variation in the $\tau_{i,t}$'s is accounted for by state fixed effects. The influence of state fixed effects is then removed from the dependent variable, and the results presented in columns 4 to 6. For this remaining variation, the residual has a substantial influence, accounting for between 83% to 92% of the variation net of state fixed effects.

The remaining entries in columns 7 to 9 of Table 8 remove the impacts of state fixed effects and the residual, allowing us to focus on the contributions of the remaining explanatory variables. Aggregate influences, captured by time fixed effects, dominate, accounting for 39% to 81% of the variation in tax variables. Of the variables that vary by state and over time, competitive states' tax policy generally proves most important though, for the longer sample, business contributions play a large role for the investment tax credit and the capital apportionment weight. Of course, this larger role is consistent with the increased precision we obtain for the effects of business contributions in the regression analysis when using the longer sample.

SUMMARY AND CONCLUSIONS

This paper has explored the role played by business campaign contributions in determining state tax policy in a world of mobile capital. We expand the standard model of tax competition to allow for the influence of business contributions on the corporate income tax rate, the investment tax credit rate, and the capital apportionment weight. Our empirical model seeks to explain each of these tax policies as functions of tax policies in competitive states (reflecting the usual role of tax competition) and business contributions, as well as control variables for the economic and political environment and state and time fixed effects. We are particularly interested in the extent to which business contributions affect tax competition and the slope of the reaction function, and hence the mobility of capital across jurisdictions.

Based on a panel of 48 U.S. states and unique data on business campaign contributions, our empirical work uncovers four key results. First, the slope of the reaction function between tax policy in a given state and the tax policies of its competitive states is negative, a result consistent with our theoretical model of profit-maximizing firms constrained by policymakers preferences that depend, in part, on business contributions. Second, we find little evidence that business contributions affect the slope of the reaction function. Third, for our longer sample period, business contributions matter for tax policy, but the economic impact is very small. Fourth, aggregate factors (e.g., the business cycle, globalization trends) play a very large role in determining state tax policies.

An important caveat with these results is that the logic of the tax competition model dictates that we estimate the models with an instrumental variables approach. The usefulness of this approach and hence the accuracy of the estimates depends on the instruments being "relevant;"(measured by goodness of fit) for the endogenous variables in the model.
The instrument relevance statistic casts doubt on some models, and future work needs to be directed toward a more systematic search for an appropriate set of instruments.

APPENDIX A: DOCUMENTATION FOR DATA ON BUSINESS CAMPAIGN CONTRIBUTIONS AND CONTRIBUTION LIMITS

Business Campaign Contributions Data Set

With financial support from the Federal Reserve Bank of San Francisco, we purchased data on state campaign contributions from the National Institute of Money in State Politics (NIMSP). The NIMSP collects data on contributions from individuals and organizations to individual candidates for state government office. The following is from the NIMSP website (www.followthemoney.org) and describes the sources of their data:

> The Institute receives its data in either electronic or paper files from the state disclosure agencies with which candidates must file their campaign finance reports. The Institute collects the information for all state-level candidates in the primary and general elections and then puts it into a database.
>
> Staff members verify that all candidates are represented and that their political party affiliations and win/loss statuses are correct. Researchers then standardize the contributor names and assign political donors an economic interest code, based either on the occupation and employer information contained in the disclosure reports or on information found through a variety of research resources. These codes are closely modeled on designations used by the federal government for classifying industry groups.
>
> While identifying and coding major labor and industry contributions is relatively straightforward, doing so for individual contributors can be more difficult. In many cases, the state requires that contributors provide the campaigns with their occupation and/or employer. When that information is available, the Institute uses it to assign a category code for individual contributors. When that information is not required or candidates do not provide it, the staff uses standard research tools to determine an economic or political identity. Phone directories provided on CD or through the Internet often include a Standard Industrial Classification for an individual contributor, particularly those who own their own business or are in an easily identifiable profession such as attorney, doctor, insurance salesman, or real estate agent. Professional directories provide additional information, as does Polk's Reverse Directories.
>
> Contributors for whom researchers cannot determine an economic interest from the information available receive a code indicating their interest is Unknown.[4]

[4] This description by the NIMSP of the extensive efforts the organization goes through to assign contributions from individuals to a particular economic sector, may lead one to think that contributions from individuals, as opposed to institutions, is the bulk of business contributions. They are not. According to the breakdown of contributions by institutions vs. individuals provided on the NIMSP website, individuals make up around a third to a half of business contributions (depending on the state and year).

The NIMSP provided us with the "Summary File" for each state. A state's Summary File contains dollar values of contributions to individual candidates, by year, aggregated across all contributors within a "sector." These sectors include industries as well as labor organizations, "ideologies," political parties, etc.. We define the "business" supersector as the sum of the following 10 sectors: agriculture; construction; communications and electronics; defense; energy and natural resources; finance, insurance, and real estate; general business; transportation; and health.

We first aggregate contributions across these 10 sectors to obtain business contributions by candidate, year, and state. Similarly, we aggregate contributions over the remaining sectors to obtain nonbusiness contributions.

The Summary Files also provide detailed information on the candidate receiving the donations – in particular, their "office" (e.g., governor, lt. governor, house or assembly, senate, supreme court, attorney general, comptroller, treasurer, public utility commission, secretary of state, etc.) and "status." Status indicates the outcome of the candidate's candidacy as of the end of the year. Candidacies in the data can have one of the following 9 statuses: general election (GE) win, GE loss, primary election loss, withdrawal, disqualification, death, unknown, still pending (as of end of year), and "did not run" (meaning the candidate received contributions in that year but was not running for office that year).

We then aggregate business contributions across candidates, by year and state, for each status and for four categories of "office": gubernatorial (includes both governor and lt. governor because in some states these are a joint ticket and so it is not possible for NIMSP to separate contributions between the governor candidate and lt. governor candidate), house (variously called by states, "house of assembly", "house of delegates", and "house of representatives"), senate, and other statewide office. In Nebraska, which has a unicameral state legislature, legislatives candidates' offices are coded as "senate."

The resulting panel data set has state-year observations on 36 business contributions (BC) variables: BC to candidates for each of the 4 offices above and for each of the 9 statuses above.

From these 36 BC variables, we construct the following variables for possible use in our analysis:

bc_allsw	– business contributions-all statewide offices (sum of the next four)
bc_gov	– business contributions-governor/lt. governor
bc_house	– business contributions-house
bc_senate	– business contributions-state senate
bc_othersw	– business contributions-other statewide offices
bc_allsw_W	– business contributions-all statewide offices, GE winners
bc_allsw_L	– business contributions-all statewide offices, GE losers

We drop Alaska and Hawaii because we lack needed variables for these states in the Chirinko and Wilson (forthcoming) data set on tax and economic variables described in the main body of this paper.

The sample period covered by this data set is 1990-2006, though there are fewer states with data prior to the 1997-98 electoral cycle. The following table shows the number of states in each two-year electoral cycle with reported business contributions:

Number of States with Reported Business Contributions in NIMSP Data	
Electoral Cycle:	# of states
1989 – 1990	12
1991 – 1992	12
1993 – 1994	19
1995 – 1996	33
1997 – 1998	41
1999 – 2000	47
2001 – 2002	48
2003 – 2004	48
2005 – 2006	48

As indicated by the table above, contributions data in the NIMSP data set are not reported for all states in all years. States can be categoried into 3 groups to describe their data availability:

1. Most (40 of 48) states have only even-year data on business contributions. These states have biennial electoral cycles that end in even-years and report contributions over the entire two-year period in that single even-year.
2. Two states – New Jersey and Virginia – have only odd-year contributions data; they have biennial electoral cycles ending in odd-years and report contributions over the entire two-year period in that single odd-year.
3. Five states –Kentucky, Louisiana, Mississippi, Pennsylvania, and Wisconsin – have biennial, even-year elections but report contributions that take place in either election years or non-election (odd) years. For these states, off-election-year contributions generally are for statewide offices *other* than governor, house, or senate (so governor, house, or senate contributions generally are just for even years, like the 40 states in the first group above).
4. California has a biennial, even-year cycle like group 1 above but has contributions reported for 2003 in connection with the special Gubernatorial recall election in that year.

Because most states only report contributions at a two-year, electoral-cycle frequency, it is not known how contributions are divided among the two years within a cycle. If non-election-year contributions are generally zero, then the appropriate way to handle the data is to assign all of the contributions for the cycle to the election year and assume unreported contributions are 0 in non-election years. In this case, the data set remains at an annual frequency for the purposes of our regression analysis.

If, however, contributions generally are made in both years of the cycle, then it is not possible to measure contributions at an annual frequency to match the annual frequency of the other variables in our regression model. In this case, all of the variables in the model should be converted to a biennial frequency, using their 2-year sums (or annual averages) over each 2-year electoral cycle as their biennial values. For example, consider the following annual regression equation, [A.1] $\tau_{i,t} = \gamma * BC_{i,t} + \varepsilon_{i,t}$,

where $\tau_{i,t}$ is some tax policy variable for state i in year t, $BC_{i,t}$ is business contributions, and $\varepsilon_{i,t}$ is the error term. This obviously suggests

[A.2] $\tau_{i,t-1} = \gamma * BC_{i,t-1} + \varepsilon_{i,t-1}$.

Suppose $BC_{i,t}$ and $BC_{i,t-1}$ are separately unobserved, but their sum, ($BC_{i,t} + BC_{i,t-1}$), is observed for even years t, t-2, t-4,…. Then the regression equation can be transformed into the following model with observed data,

[A.3] $(\tau_{i,t} + \tau_{i,t-1}) = \gamma * (BC_{i,t} + BC_{i,t-1}) + (\varepsilon_{i,t} + \varepsilon_{i,t-1})$, for even years t, t-2, t-4,….

Since it is not known which of the above two cases is true, we construct and analyze both an annual data set – where missing/unreported contributions are assumed to equal 0 in non-election years – and a biennial (even-year) data set. First, we merge the annual data set with the annual panel data set from Chirinko and Wilson (forthcoming) on business tax polices (corporate income tax rates, investment tax credit rates, capital apportionment weights), state economic activity (gross state product; quantities of manufacturing value added, capital stock, investment, labor; prices of manufacturing value added, capital stock, investment, and labor), and other relevant state variables. The data set is fully documented in that paper.

The merged data set is an unbalanced panel from 1990 to 2006. We refer to this data set as the "annual" data set. We also create a biennial data set by converting variables to a biennial frequency using 2-year sums (or annual averages) over each 2-year electoral cycle. Note that the biennial periods end in even years.

In our analyses, for both data sets, we generate results for both this full, unbalanced panel covering the period 1990 to 2006 as well as a (nearly) balanced panel covering the period 1997 to 2006.

Data On Campaign Contributions Limits

There are at least 6 different kinds of campaign contribution limits (CCLs): (1) limits on corporate contributions, (2) on individual contributions, (3) on candidates' own and family contributions, (4) on political action committee (PAC) contributions, (5) on labor union contributions, and (6) contributions by political parties.

The basic principle we use for constructing a uniform panel of data for these 6 types of CCLs is, "What is the maximum amount that a contributor (individual, corporation, candidate, PAC, union, or party) could contribute to a single candidate in this state in this electoral cycle?" There are two main categories of CCLs: CCLs that set a maximum contribution limit from a single contributor to a specific candidate (the easiest case), and CCLs that cap aggregate contributions from a single contributor to all candidates seeking a particular office, such as governor or state senate. In the latter case, we assume that the contributor would use their entire allowable donation (if binding) for one candidate, to maximize impact. Contribution maximums in the dataset specify the most a contributor can contribute in a particular election cycle, which includes both the primary and general elections. In states where the limit applies on a calendar-year basis, we multiply it by 2 to be (roughly) equivalent to a primary/general cycle.

Nebraska is a special case, where candidates are limited in the total amount they can receive in corporate donations The assumption here is that one donor can give an amount equal to this maximum (e.g., $825,000 for governor).

There have been a number of court cases on whether particular campaign finance limits are unconstitutional, which is a primarily reason for the large amount of within-state variation in CCLs over time. Some states (e.g., Colorado) abandoned all limits for 2 years, then rolled out new ones that presumably passed Constitutional muster. This is one reason to think CCLs are exogenous with respect to a state's tax policy.

In a handful of states, the maximum contribution limit is higher if the candidate agrees to spending limits (New Hampshire) or is qualified to receive public funding (Rhode Island). In these cases, we assume that these conditions apply.

Our data sources for CCLs are as follows:

Number of States with Reported Business Contributions in NIMSP Data	
Electoral Cycle:	Source
1995 – 1996	*The Book of the States* (The Council of State Governments : Lexington, Kentucky, Various Issues).
1997 – 1998	Federal Election Commission http://www.fec.gov/pubrec/cfl/cfl98/cflaw98.html
1999 – 2000	Federal Election Commission http://www.fec.gov/pubrec/cfl/cfl00/cfl00.htm
2001 – 2002	Federal Election Commission http://www.fec.gov/pubrec/cfl/cfl02/cfl02.shtml
2003 – 2004	National Conference of State Legislatures (NCSL), historical tables "Individual to Candidate Contributions," "Corporate to Candidate Contributions" from archived versions of the NCSL website. These archived websites are available at: http://web.archive.org/web/*/http://www.ncsl.org. For example, 2004 limits are found at the 2005 NCSL web page: http://web.archive.org/web/20051113033231/www.ncsl.org/programs/legman/about/CorpCand.htm
2005 – 2006	

APPENDIX B: BIENNIAL TABLES

The tables in this appendix are based on biennial data, and the tabular presentation follows exactly the pattern with annual data.

TABLE 1 -- BIENNIAL DATA
SUMMARY STATISTICS
SAMPLE PERIOD: 1997-2006

	Mean	Standard Deviation	Quartiles 25%	50%	75%
	(1)	(2)	(3)	(4)	(5)
A. Business Contributions					
$BC^{H}_{i,t}$	0.254	0.195	0.134	0.224	0.327
$BC^{S}_{i,t}$	0.179	0.149	0.089	0.156	0.235
$BC^{G}_{i,t}$	0.301	0.400	0.022	0.147	0.428
$BC^{HSG}_{i,t}$	0.734	0.613	0.364	0.585	0.908
B. Tax Variables					
$CIT_{i,t}$	0.066	0.027	0.052	0.071	0.085
$CIT^{\#}_{i,t}$	0.068	0.007	0.063	0.066	0.073
$ITC_{i,t}$	0.014	0.023	0.000	0.000	0.020
$ITC^{\#}_{i,t}$	0.015	0.003	0.012	0.015	0.017
$CAW_{i,t}$	0.203	0.118	0.125	0.250	0.250
$CAW^{\#}_{i,t}$	0.204	0.021	0.189	0.201	0.218
C. Control Variables					
$IK_{i,t-1}$	0.111	0.027	0.091	0.108	0.123
$VOTERPREFERENCES_{i,t-1}$	0.482	0.366	0.000	0.500	0.750
Number of Observations	218				

TABLE 2 -- BIENNIAL DATA
OLS AND GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION SPECIFICATION
SAMPLE PERIOD: 1997-2006

	$\tau^{\#}_{i,t}$ Exogenous			$\tau^{\#}_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-2.753	-1.663	-1.570	-2.002	2.895	0.607
	{0.061}	{0.042}	{0.117}	{0.126}	{0.247}	{0.689}
$\tau^{\#}_{i,t-1}$	-0.522	0.257	0.328	-0.310	-3.174	-1.095
	{0.733}	{0.518}	{0.588}	{0.807}	{0.141}	{0.326}
$\tau^{\#}_{i,t-2}$	-0.008	-0.294	0.321	0.132	1.271	0.394
	{0.994}	{0.522}	{0.612}	{0.875}	{0.188}	{0.210}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$s	-3.283	-1.701	-0.921	-2.180	0.991	-0.094
	{0.091}	{0.077}	{0.113}	{0.029}	{0.481}	{0.869}
B. Control Variables						
$IK_{i,t-1}$	0.012	0.021	-0.010	0.011	-0.005	0.037
	{0.326}	{0.402}	{0.930}	{0.317}	{0.810}	{0.546}
$VOTERPREFERENCES_{i,t-1}$	0.002	-0.002	-0.002	0.002	-0.003	0.003
	{0.086}	{0.397}	{0.877}	{0.008}	{0.193}	{0.773}
$HOUSEELECTION_{i,t}$	-0.0005	-0.004	0.017	0.000	-0.0056	0.052
	{0.441}	{0.363}	{0.276}	{0.746}	{0.148}	{0.050}
C. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.273	0.605	0.314
Eigenvalue Statistic for the $\tau^{\#}_{i,t}$	-----	-----	-----	12.858	8.652	3.415
R^2	0.142	0.061	0.160	-----	-----	-----
Number of Observations	218	218	218	218	218	218

TABLE 3 -- BIENNIAL DATA
GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION AND BUSINESS CONTRIBUTION VARIABLES
SAMPLE PERIOD: 1997-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-2.038	2.841	0.517	-2.123	1.478	1.047
	{0.124}	{0.253}	{0.714}	{0.095}	{0.222}	{0.275}
$\tau^{\#}_{i,t-1}$	-0.124	-3.240	-0.881	0.518	-2.177	-1.240
	{0.918}	{0.127}	{0.389}	{0.628}	{0.072}	{0.098}
$\tau^{\#}_{i,t-2}$	0.035	1.279	0.223	-0.314	0.745	0.139
	{0.965}	{0.180}	{0.561}	{0.671}	{0.197}	{0.628}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$s	-2.128	0.880	-0.141	-1.920	0.047	-0.053
	{0.032}	{0.532}	{0.797}	{0.047}	{0.948}	{0.887}
B. Business Contributions						
$BC_{i,t}$	0.230	0.753	-5.104	-0.015	0.692	-2.873
	{0.283}	{0.187}	{0.128}	{0.916}	{0.094}	{0.201}
$BC_{i,t-1}$	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----
γ = Sum of Coefficients on the $BC_{i,t}$s	0.230	0.753	-5.104	-0.015	0.692	-2.873
	{0.283}	{0.187}	{0.128}	{0.916}	{0.094}	{0.201}
C. Control Variables						
$IK_{i,t-1}$	0.010	-0.008	0.058	0.012	-0.001	0.074
	{0.362}	{0.686}	{0.289}	{0.243}	{0.941}	{0.152}
$VOTERPREFERENCES_{i,t-1}$	0.002	-0.003	0.003	0.002	-0.003	0.000
	{0.010}	{0.165}	{0.740}	{0.016}	{0.152}	{0.995}
$HOUSEELECTION_{i,t}$	-0.002	-0.009	0.072	-0.001	-0.007	0.036
	{0.224}	{0.080}	{0.037}	{0.556}	{0.088}	{0.091}
D. Instrument Quality						
p-Value for the J Statistic	0.237	0.635	0.327	0.397	0.885	0.395
Eigenvalue Statistic	12.717	8.535	3.418	6.134	3.469	1.959
Number of Observations	218	218	218	218	218	218

TABLE 4 -- BIENNIAL DATA
GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION AND BUSINESS CONTRIBUTION VARIABLES INTERACTED
SAMPLE PERIOD: 1997-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-0.986	6.121	1.159	-0.673	2.924	0.441
	{0.752}	{0.210}	{0.417}	{0.791}	{0.383}	{0.752}
$\tau^{\#}_{i,t-1}$	0.977	-5.930	-2.807	0.420	-3.194	-3.628
	{0.696}	{0.141}	{0.064}	{0.850}	{0.260}	{0.010}
$\tau^{\#}_{i,t-2}$	-1.354	1.477	1.041	-0.732	0.964	1.570
	{0.220}	{0.248}	{0.129}	{0.492}	{0.263}	{0.058}
α = Sum of Coefficients on the	-1.364	1.668	-0.607	-0.985	0.694	-1.617
$\tau^{\#}_{i,t}$s	{0.326}	{0.429}	{0.145}	{0.396}	{0.610}	{0.054}
B. Business Contributions						
$BC_{i,t}$	-2.245	-2.112	24.860	-8.085	-2.046	184.674
	{0.677}	{0.540}	{0.444}	{0.180}	{0.435}	{0.000}
$BC_{i,t-1}$	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----
γ = Sum of Coefficients on the	-2.245	-2.112	24.860	-8.085	-2.046	184.674
$BC_{i,t}$s	{0.677}	{0.540}	{0.444}	{0.180}	{0.435}	{0.000}
$\tau^{\#}_{i,t} * (BC_{i,t} + BC_{i,t-1})$	0.299	0.876	0.520	0.599	0.315	-0.251
	{0.722}	{0.175}	{0.271}	{0.444}	{0.547}	{0.487}
$\tau^{\#}_{i,t-1} * (BC_{i,t} + BC_{i,t-1})$	0.281	-0.618	-1.327	-0.102	-0.124	-1.855
	{0.691}	{0.181}	{0.055}	{0.879}	{0.757}	{0.003}
$\tau^{\#}_{i,t-2} * (BC_{i,t} + BC_{i,t-1})$	-0.539	-0.188	0.657	-0.368	-0.046	1.209
	{0.043}	{0.396}	{0.076}	{0.160}	{0.770}	{0.002}
δ = Sum of Coefficients on the	0.040	0.070	-0.149	0.130	0.146	-0.898
Interaction Terms	{0.637}	{0.682}	{0.352}	{0.177}	{0.298}	{0.000}
C. Control Variables						
$IK_{i,t-1}$	0.008	0.005	0.070	0.010	0.000	0.068
	{0.452}	{0.810}	{0.219}	{0.355}	{0.981}	{0.340}
$VOTERPREFERENCES_{i,t-1}$	0.002	-0.002	0.003	0.002	-0.002	0.006
	{0.039}	{0.516}	{0.663}	{0.020}	{0.237}	{0.449}
$HOUSEELECTION_{i,t}$	-0.002	-0.013	0.062	-0.002	-0.007	0.039
	{0.203}	{0.098}	{0.077}	{0.216}	{0.308}	{0.162}
D. Instrument Quality						
p-Value for the J Statistic	0.090	0.657	0.196	0.379	0.722	0.324
Eigenvalue Statistic	4.859	3.868	3.900	1.625	0.833	1.478
Number of Observations	218	218	218	218	218	218

TABLE 5 -- BIENNIAL DATA
OLS AND GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
THE ROLE OF BUSINESS CONTRIBUTIONS

PANEL I. SAMPLE PERIOD: 1997-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Business Contributions						
$BC_{i,t}$	0.244	0.807	-6.476	-0.014	0.473	-2.231
	{0.368}	{0.079}	{0.166}	{0.930}	{0.176}	{0.340}
$BC_{i,t-1}$	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----
γ = Sum of Coefficients on the	0.244	0.807	-6.476	-0.014	0.473	-2.231
$BC_{i,t}$s	{0.368}	{0.079}	{0.166}	{0.930}	{0.176}	{0.340}
HOUSEELECTION	-0.001	-0.007	0.045	0.000	-0.005	0.024
	{0.325}	{0.169}	{0.134}	{0.646}	{0.146}	{0.370}
B. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.668	0.942	0.104
Eigenvalue Statistic for $BC_{i,t}$	-----	-----	-----	380.520	380.520	380.520
R^2	0.038	0.027	0.168	-----	-----	-----
Number of Observations	218	218	218	218	218	218

PANEL II. SAMPLE PERIOD: 1990-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Business Contributions						
$BC_{i,t}$	-0.053	0.930	-5.859	-0.149	0.470	-4.714
	{0.739}	{0.044}	{0.036}	{0.153}	{0.114}	{0.017}
$BC_{i,t-1}$	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----
γ = Sum of Coefficients on the	-0.053	0.930	-5.859	-0.149	0.470	-4.714
$BC_{i,t}$s	{0.739}	{0.044}	{0.036}	{0.153}	{0.114}	{0.017}
HOUSEELECTION	-0.003	-0.008	0.023	-0.001	-0.006	0.014
	{0.359}	{0.042}	{0.288}	{0.630}	{0.027}	{0.479}
B. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.127	0.777	0.030
Eigenvalue Statistic for $BC_{i,t}$	-----	-----	-----	973.500	973.500	973.500
R^2	0.094	0.062	0.340	--	--	--
Number of Observations	264	264	264	264	264	264

TABLE 6 -- BIENNIAL DATA
OLS AND GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION SPECIFICATION
SAMPLE PERIOD: 1990-2006

	$\tau^{\#}_{i,t}$ Exogenous			$\tau^{\#}_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-1.278	-0.832	-1.264	-0.394	2.772	0.426
	{0.328}	{0.270}	{0.194}	{0.743}	{0.409}	{0.849}
$\tau^{\#}_{i,t-1}$	0.291	0.564	0.840	0.336	-2.463	-0.991
	{0.831}	{0.215}	{0.142}	{0.821}	{0.421}	{0.608}
$\tau^{\#}_{i,t-2}$	0.108	0.274	-0.906	-0.033	1.517	-0.254
	{0.896}	{0.661}	{0.215}	{0.964}	{0.237}	{0.633}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$s	-0.879	0.006	-1.331	-0.090	1.826	-0.819
	{0.638}	{0.996}	{0.048}	{0.913}	{0.268}	{0.222}
B. Control Variables						
$IK_{i,t-1}$	0.011	0.010	-0.016	0.012	-0.013	0.041
	{0.329}	{0.645}	{0.896}	{0.249}	{0.632}	{0.687}
$VOTERPREFERENCES_{i,t-1}$	0.000	-0.002	0.011	0.000	-0.002	0.019
	{0.938}	{0.303}	{0.555}	{0.729}	{0.395}	{0.093}
$HOUSEELECTION_{i,t}$	-0.003	-0.003	-0.008	-0.003	-0.006	-0.003
	{0.277}	{0.286}	{0.535}	{0.117}	{0.079}	{0.906}
C. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.351	0.573	0.019
Eigenvalue Statistic for the $\tau^{\#}_{i,t}$	-----	-----	-----	11.349	3.550	3.441
R^2	0.111	0.053	0.325	--	--	--
Number of Observations	264	264	264	264	264	264

TABLE 7 -- BIENNIAL DATA+A28
GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION AND BUSINESS CONTRIBUTION VARIABLES
SAMPLE PERIOD: 1990-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-0.396	2.122	0.043	-0.503	0.931	0.751
	{0.742}	{0.574}	{0.984}	{0.641}	{0.525}	{0.645}
$\tau^{\#}_{i,t-1}$	0.341	-2.067	-0.501	0.433	-1.187	-0.961
	{0.815}	{0.530}	{0.783}	{0.691}	{0.404}	{0.502}
$\tau^{\#}_{i,t-2}$	-0.012	1.351	-0.497	-0.001	0.742	-0.669
	{0.986}	{0.317}	{0.347}	{0.999}	{0.266}	{0.211}
α = Sum of Coefficients on the	-0.067	1.406	-0.956	-0.071	0.486	-0.879
$\tau^{\#}_{i,t}$s	{0.936}	{0.453}	{0.136}	{0.939}	{0.539}	{0.124}
B. Business Contributions						
$BC_{i,t}$	-0.037	0.706	-6.282	-0.112	0.535	-5.300
	{0.766}	{0.283}	{0.006}	{0.217}	{0.080}	{0.004}
$BC_{i,t-1}$	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----
γ = Sum of Coefficients on the	-0.037	0.706	-6.282	-0.112	0.535	-5.300
$BC_{i,t}$s	{0.766}	{0.283}	{0.006}	{0.217}	{0.080}	{0.004}
C. Control Variables						
$IK_{i,t-1}$	0.012	-0.013	0.045	0.013	-0.003	0.037
	{0.235}	{0.608}	{0.607}	{0.132}	{0.815}	{0.657}
$VOTERPREFERENCES_{i,t-1}$	0.000	-0.002	0.015	0.001	-0.002	0.013
	{0.761}	{0.393}	{0.159}	{0.278}	{0.291}	{0.216}
$HOUSEELECTION_{i,t}$	-0.003	-0.009	0.032	-0.001	-0.007	0.024
	{0.121}	{0.006}	{0.216}	{0.646}	{0.013}	{0.255}
D. Instrument Quality						
p-Value for the J Statistic	0.364	0.548	0.083	0.081	0.827	0.054
Eigenvalue Statistic	11.137	2.905	3.254	5.375	1.413	2.204
Number of Observations	264	264	264	264	264	264

TABLE 8 -- BIENNIAL DATA
VARIANCE DECOMPOSITION OF $\tau_{i,t}$

PANEL A. SAMPLE PERIOD: 1997-2006

Explanatory Variable	Adjusted Total Variation			Net of State Fixed Effects			Net of State Fixed Effects and Residual		
	CIT	ITC	CAW	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Fixed Effects	98%	83%	94%	.	.	.	.	.	.
Residual	2%	16%	5%	82%	90%	82%	.	.	.
Time Fixed Effects	0%	1%	0%	9%	4%	4%	52%	44%	22%
$\{\tau^{\#}_{i,t}, \tau^{\#}_{i,t-1}, \tau^{\#}_{i,t-2}\}$	0%	0%	0%	5%	3%	3%	26%	26%	19%
$\{BC_{i,t}, BC_{i,t-1}\}$	0%	0%	1%	1%	2%	9%	5%	16%	49%
$IK_{i,t-1}$	0%	0%	0%	0%	0%	0%	2%	1%	0%
$VOTERPREFERENCES_{i,t-1}$	0%	0%	0%	2%	0%	0%	12%	4%	0%
$HOUSEELECTION_{i,t}$	0%	0%	0%	1%	1%	2%	3%	9%	10%
Adjusted Total Variance	100%	100%	100%	100%	100%	100%	100%	100%	100%

PANEL B. SAMPLE PERIOD: 1990-2006

Explanatory Variable	Adjusted Total Variation			Net of State Fixed Effects			Net of State Fixed Effects and Residual		
	CIT	ITC	CAW	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Fixed Effects	98%	81%	90%	.	.	.	.	.	.
Residual	2%	17%	7%	91%	91%	77%	.	.	.
Time Fixed Effects	0%	1%	1%	3%	3%	10%	34%	36%	44%
$\{\tau^{\#}_{i,t}, \tau^{\#}_{i,t-1}, \tau^{\#}_{i,t-2}\}$	0%	0%	1%	1%	2%	3%	10%	18%	12%
$\{BC_{i,t}, BC_{i,t-1}\}$	0%	1%	1%	3%	3%	9%	27%	31%	41%
$IK_{i,t-1}$	0%	0%	0%	0%	0%	0%	4%	0%	0%
$VOTERPREFERENCES_{i,t-1}$	0%	0%	0%	0%	0%	1%	0%	3%	3%
$HOUSEELECTION_{i,t}$	0%	0%	0%	2%	1%	0%	25%	12%	0%
Adjusted Total Variance	100%	100%	100%	100%	100%	100%	100%	100%	100%

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TABLE 1
SUMMARY STATISTICS
SAMPLE PERIOD: 1997-2006

	Mean	Standard Deviation	Quartiles 25%	Quartiles 50%	Quartiles 75%
	(1)	(2)	(3)	(4)	(5)
A. Business Contributions					
$BC^{H}_{i,t}$	0.249	0.357	0.000	0.000	0.448
$BC^{S}_{i,t}$	0.177	0.273	0.000	0.000	0.304
$BC^{G}_{i,t}$	0.294	0.596	0.000	0.000	0.292
$BC^{HSG}_{i,t}$	0.719	1.068	0.000	0.008	1.146
B. Tax Variables					
$CIT_{i,t}$	0.066	0.027	0.052	0.071	0.085
$CIT^{\#}_{i,t}$	0.067	0.007	0.063	0.066	0.073
$ITC_{i,t}$	0.014	0.023	0.000	0.000	0.020
$ITC^{\#}_{i,t}$	0.015	0.003	0.012	0.015	0.017
$CAW_{i,t}$	0.203	0.119	0.100	0.250	0.250
$CAW^{\#}_{i,t}$	0.204	0.021	0.188	0.202	0.219
C. Control Variables					
$IK_{i,t-1}$	0.111	0.029	0.093	0.108	0.126
$VOTERPREFERENCES_{i,t-1}$	0.485	0.368	0.000	0.500	1.000
Number of Observations	434				

Notes To Table 1:
The summary statistics are calculated for the period 1997 to 2006. In panel A, the business contributions variables ($BC^{x}_{i,t}$) are defined as the logarithm of business campaign contributions per capita and are contributions to candidates for the house (H), senate (S), governorship (G), and all three offices combined (HSG). In panel B, the tax variables are the corporate income tax rate ($CIT_{i,t}$), the investment tax credit rate ($ITC_{i,t}$), and the capital apportionment weight ($CAW_{i,t}$). The tax variables with a superscript $^{\#}$ are tax variables in the competitive states, where the competitive set of states is the other 47 continental states. (The superscript $^{\#}$ can be interpreted as a spatial lag operator.) The $CIT^{\#}_{i,t}$ variable, for example, is defined as a weighted-average of the corporate income tax rates for each of these 47 competitive states, and the weights are the inverse of the distance between the population centroids for state i and that of a competitive state, normalized to sum to unity. The $ITC^{\#}_{i,t}$ and $CAW^{\#}_{i,t}$ variables are computed in a similar manner. In panel C, the control variables are the investment/capital ratio ($IK_{i,t-1}$) lagged one period capturing economic conditions and the political preferences of state residents ($VOTERPREFERENCES_{i,t-1}$) defined as 0.0, 0.5, or 1.0 depending on the extent to which Republicans control the state government. See Section 3 and the Data Appendix for further details about data sources and construction.

TABLE 2
OLS AND GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION SPECIFICATION
SAMPLE PERIOD: 1997-2006

	$\tau^{\#}_{i,t}$ Exogenous			$\tau^{\#}_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
Variable						
$\tau^{\#}_{i,t}$	-2.685	-1.261	-0.987	-3.514	2.839	-0.497
	{0.042}	{0.053}	{0.080}	{0.121}	{0.152}	{0.938}
$\tau^{\#}_{i,t-1}$	0.479	-0.228	0.043	1.438	-3.555	-0.210
	{0.663}	{0.526}	{0.918}	{0.577}	{0.053}	{0.938}
$\tau^{\#}_{i,t-2}$	-0.826	-0.152	0.050	-0.803	-0.124	-0.017
	{0.180}	{0.573}	{0.905}	{0.500}	{0.756}	{0.992}
α = Sum of Coefficients on the	-3.033	-1.641	-0.894	-2.879	-0.841	-0.724
$\tau^{\#}_{i,t}$s	{0.069}	{0.051}	{0.080}	{0.001}	{0.085}	{0.709}
B. Control Variables						
$IK_{i,t-1}$	0.008	0.020	0.007	0.007	0.009	0.018
	{0.347}	{0.339}	{0.927}	{0.260}	{0.448}	{0.804}
$VOTERPREFERENCES_{i,t-1}$	0.002	-0.003	0.000	0.002	-0.003	0.003
	{0.091}	{0.248}	{0.967}	{0.000}	{0.025}	{0.793}
$HOUSEELECTION_{i,t}$	-0.0005	-0.001	0.007	-0.001	-0.0001	0.003
	{0.093}	{0.056}	{0.401}	{0.184}	{0.945}	{0.870}
C. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.331	0.801	0.207
Eigenvalue Statistic for the $\tau^{\#}_{i,t}$	-----	-----	-----	19.998	22.035	0.370
R^2	0.127	0.062	0.130	-----	-----	-----
Number of Observations	434	434	434	434	434	434

Notes To Table 2:
OLS (columns 1 to 3) and GMM (columns 4 to 6) estimates are based on equation [10] with panel data for 48 states for the period 1997 to 2006. Missing observations for the business contributions data and outliers reduce the sample to 434 state/year observations. Columns 1, 2, and 3 treat $\tau^{\#}_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $\tau^{\#}_{i,t}$ as an endogenous variable. The dependent variable ($\tau_{i,t}$) is the tax variable appearing at the top of the column. See the Notes To Table 1 for details about the table entries. $HOUSEELECTION_{i,t}$ is an indicator variable taking a value of 1.0 for years during which an election to the House is held, 0 otherwise. All models contain state and time fixed effects. The α parameter measures the long-run impact of a change in $\tau^{\#}_{i,t}$ and is defined in equation [10] as the sum of the immediately preceding coefficients on the $\tau^{\#}_{i,t}$'s; the standard error for α is the sum of the underlying variances and covariances raised to the one-half power. Standard errors are heteroscedastic consistent based on the technique in White (1980); they are not presented in the table. Rather, the p-values for the t-test that the immediately preceding coefficient is zero are presented in braces. The J statistic assesses instrument validity via the overidentifying restrictions and is computed according to the formula in Hansen (1982). The p-values for the J statistic are presented in the table. A p-value greater than an arbitrary critical value (e.g., 5%) implies that the instruments are valid. The eigenvalue statistic assesses instrument relevance for $\tau^{\#}_{i,t}$ in terms of a first-stage regression of an endogenous variable on the instruments, as proposed by Stock, Wright, and Yogo (2002). The null hypothesis of instrument irrelevance at a significance level of 5% is assessed with Table 1 of Stock and Yogo (2005). For the models estimated in this paper, an eigenvalue statistic greater than 10.9 (8.8) or 18.4 (14.0) rejects the null hypothesis constructed with a bias of 10% or 5%, respectively, when there is one (two) endogenous variable. The instruments for $\tau^{\#}_{i,t}$ depend on the tax variable and are for the competitive states: CIT – the first and second spatial lags of the product of an indicator variable taking the value of 1 if the governor is a Republican (R) and an indicator variable taking a value of 1 if the legislature is controlled by the Democrats (D), and the first and second spatial lags of an indicator variable taking the value of 1 if a R governor is reelected lagged one time period; ITC – the first spatial lag of an indicator variable taking the value of 1 if the governor is R, and the first spatial lag of the product of an indicator variable taking the value of 1 if the governor is R and an indicator variable taking the value of 1 if the legislature is D; CAW – the first and second spatial lags of an indicator variable taking the value of 1 if the party holding the governorship changed from R to Democratic or Independent (DI) lagged one time period and the first and second order spatial lags of an indicator variable taking the value of 1 if the incumbent is reelected lagged one time period. The R^2 statistic measures the fraction of total variation measured by the model, including that explained by state and year fixed effects.

TABLE 3
GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION AND BUSINESS CONTRIBUTION VARIABLES
SAMPLE PERIOD: 1997-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
Variable						
$\tau^{\#}_{i,t}$	-3.670	2.865	-0.565	-2.782	1.918	1.041
	{0.098}	{0.138}	{0.928}	{0.170}	{0.106}	{0.674}
$\tau^{\#}_{i,t-1}$	1.608	-3.575	-0.182	0.619	-2.717	-0.827
	{0.509}	{0.047}	{0.945}	{0.783}	{0.022}	{0.454}
$\tau^{\#}_{i,t-2}$	-0.916	-0.122	0.007	-0.417	-0.121	-0.429
	{0.402}	{0.760}	{0.997}	{0.676}	{0.737}	{0.585}
α = Sum of Coefficients on the	-2.978	-0.832	-0.740	-2.580	-0.920	-0.215
$\tau^{\#}_{i,t}$s	{0.001}	{0.082}	{0.700}	{0.001}	{0.009}	{0.774}
B. Business Contributions						
$BC_{i,t}$	-0.036	0.080	-0.163	-0.088	0.058	0.205
	{0.871}	{0.822}	{0.886}	{0.657}	{0.864}	{0.887}
$BC_{i,t-1}$	-0.119	0.158	0.176	-0.134	0.171	0.544
	{0.531}	{0.640}	{0.859}	{0.457}	{0.461}	{0.437}
γ = Sum of Coefficients on the	-0.154	0.237	0.012	-0.222	0.229	0.750
$BC_{i,t}$s	{0.696}	{0.718}	{0.994}	{0.549}	{0.673}	{0.690}
C. Control Variables						
$IK_{i,t-1}$	0.008	0.008	0.016	0.010	0.011	0.034
	{0.253}	{0.483}	{0.812}	{0.151}	{0.351}	{0.586}
$VOTERPREFERENCES_{i,t-1}$	0.002	-0.003	0.003	0.002	-0.003	0.001
	{0.000}	{0.026}	{0.777}	{0.000}	{0.023}	{0.840}
$HOUSEELECTION_{i,t}$	-0.001	0.000	0.005	-0.001	0.001	0.007
	{0.285}	{0.813}	{0.817}	{0.346}	{0.716}	{0.648}
D. Instrument Quality						
p-Value for the J Statistic	0.371	0.795	0.203	0.522	0.854	0.584
Eigenvalue Statistic	20.437	23.055	0.364	10.215	9.131	0.529
Number of Observations	434	434	434	434	434	434

Notes To Table 3:

GMM estimates are based on equation [10]. Columns 1, 2, and 3 treat $BC_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $BC_{i,t}$ as an endogenous variable. The $BC_{i,t}$ variable is the logarithm of business campaign contributions made to candidates for the state house (assembly) per capita. See the Notes to Tables 1 and 2 for details about the table entries. The instruments for $BC_{i,t}$ are the logarithm of the ratio of non-business campaign contributions to winning house candidates to non-business campaign contributions to losing house candidates, the preceding variable squared, non-business campaign contributions to all house candidates, number of candidates for the house, and corporate contributions limit for a single donor corporation to all candidates for the house. The coefficients for $BC_{i,t}$, $BC_{i,t-1}$, and γ are multiplied by 1,000 to facilitate presentation.

TABLE 4
GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION AND BUSINESS CONTRIBUTION VARIABLES INTERACTED
SAMPLE PERIOD: 1997-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
Variable						
$\tau^{\#}_{i,t}$	-15.569	40.504	13.645	-10.185	0.153	1.847
	{0.414}	{0.223}	{0.567}	{0.270}	{0.972}	{0.617}
$\tau^{\#}_{i,t-1}$	15.682	-30.942	-6.241	10.166	-1.118	-1.292
	{0.424}	{0.232}	{0.638}	{0.392}	{0.738}	{0.546}
$\tau^{\#}_{i,t-2}$	-3.359	-7.153	-5.926	-3.099	-0.224	-0.856
	{0.336}	{0.204}	{0.451}	{0.497}	{0.821}	{0.697}
α = Sum of Coefficients on the	-3.246	2.410	1.477	-3.118	-1.189	-0.301
$\tau^{\#}_{i,t}$s	{0.004}	{0.485}	{0.632}	{0.127}	{0.363}	{0.836}
B. Business Contributions						
$BC_{i,t}$	-0.079	-6.086	-42.475	0.647	0.452	6.545
	{0.977}	{0.293}	{0.450}	{0.922}	{0.820}	{0.810}
$BC_{i,t-1}$	0.063	-7.418	-42.660	0.696	0.611	7.335
	{0.982}	{0.251}	{0.449}	{0.915}	{0.747}	{0.789}
γ = Sum of Coefficients on the	-0.015	-13.504	-85.136	1.343	1.063	13.879
$BC_{i,t}$s	{0.998}	{0.269}	{0.449}	{0.919}	{0.784}	{0.799}
$\tau^{\#}_{i,t} * (BC_{i,t} + BC_{i,t-1})$	-0.978	3.733	1.409	-0.547	-0.162	-0.016
	{0.507}	{0.228}	{0.539}	{0.457}	{0.685}	{0.968}
$\tau^{\#}_{i,t-1} * (BC_{i,t} + BC_{i,t-1})$	1.158	-2.704	-0.599	0.745	0.143	-0.006
	{0.452}	{0.263}	{0.643}	{0.490}	{0.636}	{0.977}
$\tau^{\#}_{i,t-2} * (BC_{i,t} + BC_{i,t-1})$	-0.182	-0.617	-0.570	-0.210	-0.005	-0.008
	{0.550}	{0.225}	{0.428}	{0.679}	{0.954}	{0.973}
δ = Sum of Coefficients on the	-0.001	0.411	0.241	-0.011	-0.024	-0.030
Interaction Terms	{0.979}	{0.255}	{0.462}	{0.911}	{0.832}	{0.820}
C. Control Variables						
$IK_{i,t-1}$	0.008	0.029	0.025	0.009	0.010	0.038
	{0.258}	{0.124}	{0.713}	{0.236}	{0.394}	{0.553}
$VOTERPREFERENCES_{i,t-1}$	0.002	-0.001	0.003	0.002	-0.003	-0.001
	{0.004}	{0.638}	{0.647}	{0.001}	{0.028}	{0.877}
$HOUSEELECTION_{i,t}$	0.001	-0.012	0.002	0.000	0.001	0.013
	{0.802}	{0.208}	{0.899}	{0.994}	{0.715}	{0.227}
D. Instrument Quality						
p-Value for the J Statistic	0.373	0.299	0.192	0.512	0.776	0.594
Eigenvalue Statistic	1.992	1.795	0.472	3.230	1.838	0.580
Number of Observations	434	434	434	434	434	434

Notes To Table 4:
GMM estimates are based on equation [10]. Columns 1, 2, and 3 treat $BC_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $BC_{i,t}$ as an endogenous variable. See the Notes to Tables 1 to 3 for details about the table entries. The coefficients for $BC_{i,t}$, $BC_{i,t-1}$, and γ are multiplied by 1,000.

TABLE 5
OLS AND GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
THE ROLE OF BUSINESS CONTRIBUTIONS

PANEL I. SAMPLE PERIOD: 1997-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Business Contributions						
$BC_{i,t}$	-0.056	0.230	-0.840	-0.115	0.147	-0.382
	{0.764}	{0.420}	{0.483}	{0.595}	{0.606}	{0.829}
$BC_{i,t-1}$	-0.105	0.344	0.133	-0.115	0.292	0.434
	{0.623}	{0.291}	{0.901}	{0.579}	{0.181}	{0.605}
γ = Sum of Coefficients on the	-0.162	0.574	-0.707	-0.230	0.439	0.052
$BC_{i,t}$s	{0.684}	{0.336}	{0.706}	{0.584}	{0.367}	{0.983}
HOUSEELECTION	-0.001	0.000	0.016	0.000	0.001	0.014
	{0.238}	{0.775}	{0.168}	{0.958}	{0.556}	{0.358}
B. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.689	0.846	0.974
Eigenvalue Statistic for $BC_{i,t}$	-----	-----	-----	270.297	270.297	270.297
R^2	0.035	0.019	0.110	-----	-----	-----
Number of Observations	434	434	434	434	434	434

PANEL II. SAMPLE PERIOD: 1990-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Business Contributions						
$BC_{i,t}$	-0.220	0.806	-3.390	-0.250	0.436	-3.419
	{0.086}	{0.129}	{0.156}	{0.021}	{0.137}	{0.025}
$BC_{i,t-1}$	-0.187	0.690	-3.431	-0.163	0.449	-3.384
	{0.178}	{0.120}	{0.065}	{0.139}	{0.018}	{0.001}
γ = Sum of Coefficients on the	-0.407	1.496	-6.821	-0.413	0.885	-6.803
$BC_{i,t}$s	{0.113}	{0.119}	{0.095}	{0.048}	{0.038}	{0.003}
HOUSEELECTION	0.000	-0.002	0.007	0.001	-0.001	0.006
	{0.787}	{0.247}	{0.586}	{0.123}	{0.735}	{0.600}
B. Equation Fit and Instrument						
p-Value for the J Statistic	-----	-----	-----	0.186	0.337	0.201
Eigenvalue Statistic for $BC_{i,t}$	-----	-----	-----	802.624	802.624	802.624
R^2	0.089	0.054	0.294	--	--	--
Number of Observations	522	522	522	522	522	522

Notes To Table 5:
OLS (columns 1 to 3) and GMM (columns 4 to 6) estimates are based on equation [10] with panel data for 48 states for the period 1997 to 2006 in panel I and 1990 to 2006 in panel II. Missing observations for the business contributions data and outliers reduce the sample to 434 or 522 state/year observations for panels I and II, respectively. Columns 1, 2, and 3 treat $BC_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $BC_{i,t}$ as an endogenous variable. See the Notes To Tables 1 to 4 for details about the table entries. All models contain state and time fixed effects. The γ parameter measures the long-run impact of a change in $BC_{i,t}$ and is defined in equation [10] as the sum of the immediately preceding coefficients on the $BC_{i,t}$'s. The coefficients for $BC_{i,t}$, $BC_{i,t-1}$, and γ are multiplied by 1,000.

TABLE 6
OLS AND GMM ESTIMATES OF EQUATION [10]
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION SPECIFICATION
SAMPLE PERIOD: 1990-2006

	$\tau^{\#}_{i,t}$ Exogenous			$\tau^{\#}_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
Variable						
$\tau^{\#}_{i,t}$	-2.619	-0.921	-0.831	-1.612	2.360	-7.147
	{0.017}	{0.105}	{0.161}	{0.477}	{0.454}	{0.277}
$\tau^{\#}_{i,t-1}$	0.871	0.508	0.189	0.151	-2.200	3.575
	{0.365}	{0.427}	{0.674}	{0.951}	{0.424}	{0.317}
$\tau^{\#}_{i,t-2}$	-0.021	-0.006	-0.418	0.287	0.052	1.284
	{0.975}	{0.983}	{0.455}	{0.778}	{0.886}	{0.492}
α = Sum of Coefficients on the	-1.769	-0.419	-1.060	-1.174	0.212	-2.288
$\tau^{\#}_{i,t}$s	{0.209}	{0.635}	{0.083}	{0.167}	{0.746}	{0.099}
B. Control Variables						
$IK_{i,t-1}$	0.008	0.009	-0.021	0.008	-0.001	-0.045
	{0.345}	{0.609}	{0.826}	{0.186}	{0.962}	{0.617}
$VOTERPREFERENCES_{i,t-1}$	0.001	-0.003	0.010	0.001	-0.003	0.021
	{0.462}	{0.223}	{0.511}	{0.219}	{0.089}	{0.105}
$HOUSEELECTION_{i,t}$	0.000	-0.001	0.000	0.000	0.000	-0.015
	{0.262}	{0.156}	{0.954}	{0.366}	{0.956}	{0.389}
C. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.605	0.857	0.463
Eigenvalue Statistic for the $\tau^{\#}_{i,t}$	-----	-----	-----	15.715	5.910	0.987
R^2	0.129	0.049	0.293	--	--	--
Number of Observations	522	522	522	522	522	522

Notes To Table 6:

OLS (columns 1 to 3) and GMM (columns 4 to 6) estimates are based on equation [10] with panel data for 48 states for the period 1990 to 2006. Missing observations for the business contributions data and outliers reduce the sample to 522 state/year observations. Columns 1, 2, and 3 treat $BC_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $BC_{i,t}$ as an endogenous variable. See the Notes to Tables 1 to 5 for details about the table entries.

TABLE 7
GMM ESTIMATES OF EQUATION (10)
DEPENDENT VARIABLE: $\tau_{i,t}$
TAX COMPETITION AND BUSINESS CONTRIBUTION VARIABLES
SAMPLE PERIOD: 1990-2006

	$BC_{i,t}$ Exogenous			$BC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
Variable						
$\tau^{\#}_{i,t}$	-1.220	2.393	-8.081	-1.574	1.478	-6.731
	{0.600}	{0.473}	{0.284}	{0.497}	{0.332}	{0.079}
$\tau^{\#}_{i,t-1}$	-0.168	-2.426	3.731	-0.235	-1.976	3.049
	{0.946}	{0.385}	{0.348}	{0.924}	{0.134}	{0.141}
$\tau^{\#}_{i,t-2}$	0.248	0.065	1.691	0.286	0.091	1.249
	{0.798}	{0.853}	{0.435}	{0.760}	{0.782}	{0.307}
α = Sum of Coefficients on the	-1.140	0.033	-2.659	-1.523	-0.407	-2.434
$\tau^{\#}_{i,t}$s	{0.177}	{0.964}	{0.111}	{0.081}	{0.275}	{0.008}
B. Business Contributions						
$BC_{i,t}$	-0.212	0.586	-5.091	-0.199	0.410	-4.269
	{0.106}	{0.255}	{0.033}	{0.108}	{0.262}	{0.019}
$BC_{i,t-1}$	-0.189	0.565	-4.925	-0.120	0.416	-4.539
	{0.096}	{0.122}	{0.013}	{0.263}	{0.064}	{0.001}
γ = Sum of Coefficients on the	-0.401	1.151	-10.016	-0.319	0.826	-8.808
$BC_{i,t}$s	{0.077}	{0.169}	{0.013}	{0.149}	{0.132}	{0.002}
C. Control Variables						
$IK_{i,t-1}$	0.009	-0.002	-0.031	0.011	0.007	-0.018
	{0.139}	{0.871}	{0.715}	{0.067}	{0.516}	{0.820}
$VOTERPREFERENCES_{i,t-1}$	0.001	-0.002	0.021	0.002	-0.003	0.020
	{0.281}	{0.120}	{0.140}	{0.011}	{0.038}	{0.043}
$HOUSEELECTION_{i,t}$	0.000	-0.001	-0.010	0.001	-0.001	-0.009
	{0.975}	{0.741}	{0.646}	{0.333}	{0.815}	{0.554}
D. Instrument Quality						
p-Value for the J Statistic	0.761	0.683	0.638	0.172	0.526	0.688
Eigenvalue Statistic	15.747	5.616	0.911	7.616	3.490	1.152
Number of Observations	522	522	522	522	522	522

Notes To Table 7:

GMM estimates are based on equation [10]. Columns 1, 2, and 3 treat $BC_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $BC_{i,t}$ as an endogenous variable. See the Notes to Tables 1 to 3 for details about the table entries. The coefficients for $BC_{i,t}$, $BC_{i,t-1}$, and γ are multiplied by 1,000. See the Notes to Tables 1 to 6 for details about the table entries.

TABLE 8
VARIANCE DECOMPOSITION OF $\tau_{i,t}$

PANEL A. SAMPLE PERIOD: 1997-2006

Explanatory Variable	Adjusted Total Variation			Net of State Fixed Effects			Net of State Fixed Effects and Residual		
	CIT	ITC	CAW	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Fixed Effects	98%	82%	93%	.	.	.	.	.	.
Residual	2%	17%	6%	84%	92%	91%	.	.	.
Time Fixed Effects	0%	1%	1%	10%	5%	7%	62%	62%	81%
$\{\tau^{\#}_{i,t}, \tau^{\#}_{i,t-1}, \tau^{\#}_{i,t-2}\}$	0%	0%	0%	4%	1%	1%	22%	17%	15%
$\{BC_{i,t}, BC_{i,t-1}\}$	0%	0%	0%	0%	1%	0%	1%	7%	1%
$IK_{i,t-1}$	0%	0%	0%	0%	0%	0%	2%	3%	0%
$VOTERPREFERENCES_{i,t-1}$	0%	0%	0%	2%	1%	0%	12%	11%	0%
$HOUSEELECTION_{i,t}$	0%	0%	0%	0%	0%	1%	1%	0%	3%
Adjusted Total Variance	100%	100%	100%	100%	100%	100%	100%	100%	100%

PANEL B. SAMPLE PERIOD: 1990-2006

Explanatory Variable	Adjusted Total Variation			Net of State Fixed Effects			Net of State Fixed Effects and Residual		
	CIT	ITC	CAW	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State Fixed Effects	98%	79%	90%	.	.	.	.	.	.
Residual	2%	19%	8%	86%	91%	83%	.	.	.
Time Fixed Effects	0%	1%	1%	10%	3%	12%	69%	39%	68%
$\{\tau^{\#}_{i,t}, \tau^{\#}_{i,t-1}, \tau^{\#}_{i,t-2}\}$	0%	0%	0%	3%	1%	1%	20%	13%	5%
$\{BC_{i,t}, BC_{i,t-1}\}$	0%	1%	1%	1%	4%	4%	7%	40%	25%
$IK_{i,t-1}$	0%	0%	0%	0%	0%	0%	2%	0%	0%
$VOTERPREFERENCES_{i,t-1}$	0%	0%	0%	0%	1%	0%	2%	5%	2%
$HOUSEELECTION_{i,t}$	0%	0%	0%	0%	0%	0%	0%	3%	0%
Adjusted Total Variance	100%	100%	100%	100%	100%	100%	100%	100%	100%

Notes To Table 8:
The entries are the percentage of the adjusted variance of the dependent variable accounted for by a given variable. The dependent variable is indicated by the tax variable appearing at the top of the column, and its variance has been adjusted by subtracting the covariances among the explanatory variables. The variance decomposition is based on an OLS regression. In panel I, the entries in columns 1, 4, and 7 correspond to the estimates in column 1 of Table 2, the entries in columns 2, 5, and 8 to those in column 2 of Table 2, and the entries in columns 3, 6, and 9 to those in column 3 of Table 2. In panel II, the same relations hold among entries except that Table 2 is replaced by Table 6. Columns 1 to 3 reflect the impact of all explanatory variables; columns 4 to 6 remove the impact of state fixed effects; columns 7 to 9 remove the impacts of state fixed effects and the residual.