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Can Lower Tax Rates Be Bought? Business Rent-Seeking and Tax Competition Among U.S. States

Robert S. Chirinko
University of Illinois at Chicago

Daniel J. Wilson
Federal Reserve Bank of San Francisco

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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 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. Firms recognize the factors affecting policymakers' welfare and may make 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 campaign contributions may affect tax competition and enhance or retard 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, we document a significant direct effect of business contributions on tax policy. Second, the economic value of a $1 business campaign contribution in terms of lower state corporate taxes is nearly $4. Third, the slope of the reaction function between tax policy in a given state and the tax policies of its competitive states is negative. Fourth, we highlight the sensitivity of the empirical results to state effects.

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

> 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)

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. In addition to 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 quotation at the beginning of this paper reminds, business campaign contributions are likely to be an additional influential factor on policymakers. This paper explores the connections between business contributions and business tax rates at the state level. While few executives are as explicit as Mr. Holdren about the impact of campaign contributions, there is a pervasive belief that they have a marked impact on policy decisions. We extend the standard tax competition paradigm by considering the role of business campaign contributions. 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 factors affecting policymaker's welfare and make campaign contributions to influence tax policy. These changes to the standard strategic tax competition model imply that business campaign contributions may affect not only the levels of equilibrium tax rates, but also the slope of the tax reaction function between jurisdictions. Thus, business campaign contributions may affect tax competition and enhance or retard 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 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, $1.5 billion, or nearly $5 per capita, was contributed by the business sector (as defined in Section 4) 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 campaign contributions begins by discussing a theoretical framework in which policymakers' welfare depends on the utility of the representative resident and the level of business campaign contributions. The theoretical framework is a two-step game in which firms first offer a contribution schedule linking tax rates and business campaign contributions. In the second step, policymakers' face this contribution schedule constraint and choose the combination of business campaign contributions and tax rates that maximizes their welfare. The next section introduces the econometric equation. Our empirical results are based on the reaction function 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 also include our business campaign contributions variable.

Our state-level dataset is introduced in the next section. The dataset contains four business tax variables – the corporate income tax rate, the investment tax credit rate, the capital apportionment weight, and the average corporate tax rate – and additional political variables that determine business taxes and that serve as instruments. Our unique data on state-level campaign contributions are also discussed.

We then turn to our empirical results. We find that the reaction function is negatively sloped; that is, after accounting for state and time effects and economic and political variables at the state level, tax policy in a given state moves inversely with the corporate income tax rate, the capital apportionment weight, and the average corporate tax rate. To assess the role of business campaign contributions, we augment the reaction function with business contributions to candidates for the state house (assembly). We find little evidence that business contributions affect the slope of the reaction function. However, we document a significant effect of business campaign contributions on the level of tax policy.

Lastly, we interpret these results in terms of the economic value of campaign contributions. How much are corporate taxes reduced per $1 of business contributions? We find that the economic value of a $1 business campaign contribution is nearly $4 in terms of lower state corporate taxes. These results call for further research aimed at understanding the determinants of business campaign contributions and the persistence of such large gaps between benefits and costs.

THEORETICAL FRAMEWORK

This section discusses the links between the corporate income tax rate (CIT) and business campaign contributions (BCC) in a world with mobile capital. (Our discussion focuses on the corporate income tax rate, though the model applies to any tax variable affecting capital income.) The theoretical framework presented here is a two-step game (somewhat similar to Grossman and Helpman, 1994). We begin by discussing the contribution schedule offered by firms that links CIT and BCC. Faced with this constraint, policymakers' choose the BCC/CIT combination that maximizes their welfare.

In the first-step of the game, firm profits depend on sales less four costs – the profit tax assessed at rate CIT, the fixed opportunity cost of capital, the cost of labor, and the cost of business contributions. The maximum level of profits is determined conditional on BCC and CIT. For this optimal level of profits, we construct an iso-profit relation linking CIT and BCC. An increase in BCC lowers profits, but this negative effect is counterbalanced by reduced tax payments to hold profits constant. This negative relation between BCC and CIT is the contribution schedule that constrains policymakers.

In the second-step, policymakers' maximize welfare, which depends on two arguments.

The first argument is the utility of the representative resident, reflecting benevolence for residents or a concern for reelection. Resident utility is a function of private and public goods. These assumptions are standard in the tax competition literature. We extend that literature by assuming that policymakers' welfare also depends on BCC. The level of BCC impacts policymakers by expanding their personal consumption and/or increasing their probability of reelection. This formulation of policymakers' welfare follows Grossman and Helpman (1994, equation (5)) and Edwards and Keen (1996, Section 2). In the latter model, policymakers' welfare depends on resident utility and "some item of public expenditure…which, while financed from general revenues, benefits only the policymaker…" (p. 118).

It is useful to consider the residents' utility in isolation. Residents face four constraints in maximizing their utility. First, output is determined by a production function that, crucially, depends on the amount of capital located in the state. Second, this output is allocated to private goods, public goods, and factor payments on imported capital. Third, government spending on public goods is financed by personal taxes (assumed fixed) and corporate taxes. The latter is assessed as a source-based tax on profits. Fourth, due to capital mobility, the amount of capital available in a state is negatively related to CIT and positively related to the corporate income tax rate prevailing in competitive states (CIT#). Mobility can be modeled by imposing a national rate of return constraint equating the net-of-tax marginal product of capital across states. Alternatively, to represent frictions in the national allocation of capital, we can posit a general function in which CIT has a negative, and CIT# a positive, impact on the amount of capital located in a given state. Combining the above relations, we find that, conditioned on economic and demographic variables and CIT#, resident utility depends on CIT.

In order to obtain some intuition for the underlying economic forces, assume that public goods are underprovided. In this case, an increase in CIT increases utility by financing an increase in public goods. This increase is tempered by the reduction of output that occurs as capital flows to neighboring states because of the higher CIT. The reaction of neighboring states, in terms of changing CIT#, depends on how the "windfall" from the capital flowing into their states is allocated to private and public goods. When the residents' utility maximization problem is considered in isolation, there exists a provisionally optimal CIT that depends on CIT# and other factors.

Policymakers' welfare depends positively on residents' utility (determined by CIT), as well as BCC. Conditional on holding welfare constant, an increase in BCC will lead to a decrease in CIT. The latter deviation from the optimal CIT results in lower utility for residents, and hence lower welfare for policymakers, but this latter effect is offset by the increase in policymakers' welfare from BCC. As in traditional microeconomic analyses, there is a family of indifference curves that are indexed by policymakers' welfare and that relate CIT and BCC. These indifference curves capture the fundamental tradeoff facing policymakers – the benefit of an increase in BCC is offset by lower CIT, lower public spending, and lower levels of resident utility. Constrained by firms' contribution schedule, policymakers choose the BCC/CIT combination that yields the highest possible welfare.

In sum, this two-stage game implies the existence of optimal levels of CIT and BCC as functions of CIT#, exogenous variables, and "deep" parameters (such as the parameters characterizing the forms of the welfare, utility, and production functions and the degree of capital mobility). However, these relations do not allow us to assess directly the questions of interest in this paper – the impacts of BCC on the level of CIT and the slope of the reaction function. We estimate instead the structural relation (tradeoff) between CIT and BCC that follows from the policymakers' welfare function. This relation is conditioned on CIT#, and instrumental variables are used to identify the exogenous variation in BCC and CIT#.

THE ESTIMATING EQUATION

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

$$[1] \quad \tau_{i,t} = \alpha \tau^{\#}_{i,t} + \beta x_{i,t} + u_{i,t},$$

where $\tau_{i,t}$ is a tax variable – either the corporate income tax rate, the investment tax credit rate, the capital apportionment weight, or the average corporate tax rate; $\tau^{\#}_{i,t}$ 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.

Equation [1] is the standard estimating equation for investigating tax competition, and we expand on it in five ways.[1] First, the error term is assumed to have a two-way error components structure and equals the sum of a state time-invariant effect (ζ_i), a time fixed effect (λ_t), and a random error ($\varepsilon_{i,t}$). With regard to the state effects, we present results for both Random Effects (RE) and Fixed Effects (FE) specifications. Neither estimator dominates. If the state effects are correlated with the regressors, only FE delivers consistent estimates of the α's and β's. However, with a panel short in the time dimension, as we have in this paper, the FE estimates can be estimated imprecisely.[2] The RE model, on the other hand, relies on a combination of cross-section and time-series variation and generates more precise estimates. However, the consistency of RE estimates requires that the state effects are uncorrelated with the regressors. Second, we include three variables to control for economic conditions and political preferences: 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 the investment to capital ratio for the neighboring states ($IK^{\#}_{i,t-1}$). These variables are described in more detail in the next section. Third, the tax competition variable enters with contemporaneous and two lag values.[3] 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 $BCC_{i,t}$ and $BCC_{i,t-1}$ as additional regressors. The lagged value of BCC is included to recognize that campaign contributions for a given election may be spread out over the two years leading up to the election. Fifth, since the contemporaneous values of $\tau^{\#}_{i,t}$ and $BCC_{i,t}$ are likely to be endogenous,we estimate the model by IV/GMM, though we also report results where one or both of these variables is assumed

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[1] Brueckner (2003), Brueckner and Saavedra (2001), Case, Hines, and Rosen (1993), and Devereux, Lockwood, and Redoano (2008) use a similar estimating equation.

[2] The limited variation in the time dimension is traceable to two aspects of our panel data. First, the four tax variables we examine have limited time variation in most states. This is particularly true for the capital apportionment weight, for which changes tend to be of a "one-and-done" nature (i.e., changes occur at most once or twice in the sample for most states). Second, our panel is unbalanced because only a few states have business campaign contributions data before the late 1990s (see the table "Number of States with Reported Business Contributions in NIMSP Data" in the Appendix).

[3] Data limitations precluded adding additional time lags. Allowing for a greater lag length with a lagged dependent variable generated unreliable estimates.

exogenous.[4] The excluded instruments for $\tau^{\#}_{i,t}$ in the IV/GMM regressions are variables capturing the political preferences of voters in the competitive states. The instruments used in estimation vary by the tax variable serving as the dependent variable and are described in the following section.

Based on these considerations, the following equation is the basis for the estimates reported in this paper,

$$[2] \quad \tau_{i,t} = \zeta_i + \lambda_t + \sum_{k=0}^{2} \alpha_k \tau^{\#}_{i,t-k}$$
$$+ \beta^{IK}\, IK_{i,t-1} + \beta^{VP}\, VOTERPREFERENCES_{i,t} + \beta^{IK\#}\, IK^{\#}_{i,t-1}$$
$$+ \gamma_0 BCC_{i,t} + \gamma_1 BCC_{i,t-1}$$
$$+ \varepsilon_{i,t}$$

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

THE PANEL DATASET

This section briefly describes the construction of the data used in this study. The series are for the 48 contiguous U.S. states, cover years from 1988 to 2006 (depending on the state), and can be set into three categories discussed in the following sub-sections.[5]

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[4] We search for appropriate instruments in four steps. First, the instrument set consists of included and excluded instruments; the included instruments are the exogenous variables appearing in the estimating equation (i.e., the $x_{i,t}$'s). Second, potential excluded instruments are constructed from those listed in the next section. Third, we examine all possible combinations of the excluded instruments for $\tau^{\#}_{i,t}$ and $BCC_{i,t}$ separately, store the J and eigenvalue statistics, and identify the subset of instruments (excluded and included) valid at the 10% level based on J tests. Fourth, from this subset of valid instruments, we choose the instrument set that is most relevant, as assessed by the eigenvalue statistic. The fourth step of our procedure for selecting an optimal instrument set among a large set of potential instruments is similar to that proposed in Donald and Newey (2001), although they suggest an alternative relevance statistic in place of the eigenvalue statistic.

[5] Alaska and Hawaii are excluded because of the great geographic distance to a neighboring state, thus straining the notion of a "competitive" state as defined by distance between population centroids.

Tax and Economic Variables

We primarily focus on three state tax policies in this study, and they are referred to in general as $\tau_{i,t}$ -- the corporate income tax rate ($CIT_{i,t}$), the investment tax credit rate ($ITC_{i,t}$), and the weight on capital (or property) in the state's income apportionment formula ($CAW_{i,t}$). The state corporate income tax rate is the effective marginal tax rate for the highest bracket of corporate income. The effective marginal rate is generally lower than the legislated (or statutory) rate due to the deductibility against federal taxable income of taxes paid to the state. 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. 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 generate two equations in two unknowns, and their solution yields the effective state corporate income tax rate.

The state investment tax credit is a credit against state corporate income tax liabilities. In most states, 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. For these states, the legislated ITC rate is multiplied by 2/3, which is approximately the average ratio of equipment capital to total capital in our data. Second, 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 is the weight that the state assigns to capital in its formula for apportioning income among the multiple states in which a firm generates federal taxable income. Every U.S. state that taxes corporate income uses "formulary apportionment" to instruct firms that operate in multiple states on allocating their 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 moved toward increasing the weight on sales and decreasing the weights on payroll and property. These changes encourage job creation and investment in-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 rate.

Data on CAW are obtained from the following sources. First, data by state for 1997 was obtained from Edmiston (1998), who compiled the data from the Federation of Tax Administrators (1997) and generously provided us with an update of these data for 2001. Second, we use information from Omer and Shelley (2004) documenting when each state first diverged from the traditional apportionment weights of (1/3, 1/3, 1/3) on payroll, property, and sales. This information generates a provisional series (assuming no changes between the first change and 1997 and/or between 1997 and 2001) that we then refine by checking with individual state tax departments.

The three tax policy measures discussed above have the advantage that they are directly chosen by state policymakers and hence conform well with our model of strategic tax competition and business rent-seeking. However, they do not provide a comprehensive measure of the total tax assessed on capital. A more comprehensive measure would include other taxes and fees and would account for the ability of business to avoid or mitigate the corporate income tax via various tax planning strategies. Thus, we have also constructed a measure of the "average tax rate" ($ATR_{i,t}$) as the ratio of state tax revenues from corporate taxes, severance taxes, and license fees to total state business income, as measured by gross operating surplus.

The competitive states tax policy ($\tau^{\#}_{i,t}$) is an important variable in our analysis and, for state *i*, is defined as a weighted-average of the tax policies prevailing in the other 47 contiguous 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 contiguous states. The weights are normalized to sum to unity.

In the estimating equation, we control for differing economic conditions among states by including the investment to capital ratio, $IK_{i,t}$, defined as 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.

Details concerning the construction and data sources for the series discussed in this sub-section can be found in the Data Appendix to Chirinko and Wilson (2008).

Political Variables

The political preferences of state residents ($VOTERPREFERENCES_{i,t}$) is also a control variable in the estimating equation and is 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 candidate instrumental variables for $\tau^{\#}_{i,t}$ in the GMM estimation are drawn from the following list of nine voter preference variables for competitive states. Voter preferences in competitive states should be relevant instruments – because they affect tax policy in competitive states for the same reasons that voter preferences in state *i* affect tax policy in state *i* – and valid instruments – because they are unrelated to tax policy in state *i* (conditional on state and time effects):

(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 DI 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;

(i) the reelection of a Republican incumbent governor last year.

We form first-order and second-order spatial lags (i.e., weighted averages with the same distance-weights used in constructing $\tau^{\#}_{i,t}$) of the above variables as potential instruments. Each of the four tax variables is projected against different subsets drawn from this set of potential instruments. The subset used in estimation for each tax variable is the same instrument sets selected in Chirinko and Wilson (2009) based on an optimal instrument search algorithm described in footnote 6.. The instrument sets are listed in the Notes To Table 2 and 3.

Details concerning the construction and data sources for the series discussed in this sub-section can be found in the Data Appendix to Chirinko and Wilson (2008).

Business Campaign Contributions Variables

The business campaign contributions data (BCC) are a unique part of this paper. These data are for contributions made by individuals and organizations to candidates for state office constructed from contribution-level records compiled by the National Institute for Money in State Politics (NIMSP). The NIMSP assigns each campaign contribution an economic interest code that places it in a sector. These sectors more or less follow industry classifications but also include labor organizations, "ideologies," political parties, etc. We define the "business" supersector as the sum of the following 9 sectors: agriculture; construction; communications and electronics; defense; energy and natural resources; finance, insurance, and real estate; general business; transportation; and health. For example, a contribution by a consulting firm or an individual working at a consulting firm would be credited to the general business sector and counted as a business contribution. A contribution by a university professor would be credited to the education sector and would not be counted as a business contribution. The NIMSP data are an unbalanced panel. A few states have data beginning in the late 1980s but, for most states, data on contributions are not available until the late 1990s. Several $BCC_{i,t}$ variables are available for this study: contributions to candidates for the house (H), senate (S), governorship (G), and all three offices combined (HSG). The estimates in this paper are based on business contributions made to candidates for the state house because of our *a priori* belief that revenue bills will tend to be initiated in this legislative chamber and because house elections occur at a greater frequency (every two years) and with more regularity than senate or gubernatorial elections.[6] The $BCC^H_{i,t}$ variable is defined as the logarithm of business campaign contributions made to candidates for the state house per capita.

The candidate instrumental variables for $BCC_{i,t}$ in the GMM estimation are drawn from the following list of six variables based on campaign contributions and the number of candidates:

(a) the level of campaign contribution limits for corporations to house candidates in that state;

(b) the number of candidates that ran for a state house seat;

(c) the amount of non-business campaign contributions to winning candidates;

(d) the amount of non-business contributions to losing candidates;

(e) the ratio of (c) to (d), as a measure of the funding competitiveness of races within the state;

(f) the amount of business contributions to candidates for other, non-tax-policy-setting state offices (i.e., offices other than governor, state house, or state senate).

The optimal instrument set for $BCC_{i,t}$ is chosen in the same manner as for $\tau^{\#}_{i,t}$ described in footnote 6. This set for $BCC_{i,t}$ is the same in all four models (which differ by the tax variable serving as the dependent variable) and consists of the single variable, the number of candidates that ran for a state house seat in state *i* and year *t* (item (b)).

Details concerning the construction and data sources for the series discussed in this sub-section can be found in the Appendix.

Summary statistics for the business campaign contributions, tax, and control variables are presented in Table 1. Note that the "H", "S", "G", and "HSG" superscripts on BCC in the table refer to "House," "Senate," "Governor," and "House, Senate, and Governor combined,"

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[6] The proportion of seats up for elections generally is constant over time for state houses but varies for state senates, which hampers the comparability of a state's senate contributions data across different years. It should also be noted that the relative infrequency of gubernatorial elections is reflected in the lumpiness of the data on campaign contributions for gubernatorial candidates, typically positive only every fourth year. Such lumpiness, particularly in a panel with a short time dimension, greatly limits our ability to estimate the effect of gubernatorial contributions on tax policy.

respectively. There are at least three notable characteristics. First, all of the business contributions series exhibit a good deal of variation, as standard deviations exceed their means, yet have zero values for more than 50% of observations (see the quartiles in columns 3 to 5). Specifically, the proportion of observations with zero values is 53%, 55%, and 63% for BCC to House, Senate, and Governor, respectively. 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. Second, among the tax variables, $ITC_{i,t}$ has the most variation (relative to its mean). Third, the averaging underlying the definition of the competitive states tax policy and investment/capital ratio variables (indicated by a superscript $^{\#}$) has a substantial effect in reducing the variation in these variables relative to their in-state counterparts.

EMPIRICAL RESULTS

Tax Competition – Baseline Results

OLS and GMM estimates of the standard tax competition model, defined in equation [2] with the effect of BBC removed by constraining the γ's to equal zero, are presented in Table 2 for $CIT_{i,t}$, $ITC_{i,t}$, and $CAW_{i,t}$. The regressions underlying Table 2 are based on a Random Effects (RE) model. The p-values, based on heteroskedasticity-robust standard errors, are shown in braces below each coefficient estimate. We begin with the OLS estimates in columns 1 to 3 of Table 2. The sum of the coefficients on the competitive states tax policy, α, is negative for all three tax variables, though it is statistically significant only for the capital apportionment weight; 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 potentially inconsistent estimates. The OLS estimates assume that $\tau^{\#}_{i,t}$ is exogenous and, hence, the results in columns 1 to 3 must be viewed cautiously. An instrumental variables estimator is required.

Comparable GMM estimates with the RE model are presented in columns 4 to 6. The instruments vary by tax variable and are listed in the Notes To Tables 2 and 3. Relative to the OLS estimates, the GMM estimates of the α's are lower (in absolute value) for each tax variable. Each remains negative, though none of the three are statistically significant.

The results of estimating the same specifications using a Fixed Effects (FE) model are shown in Table 3. The reaction function slope for all three tax policies remains negative. However, in the FE model, the GMM estimated slope for CIT is now statistically significant at the 10% level and that for CAW has a p-value only slightly above 10%. The α for ITC is very close to zero. This pattern of results may be partly explained by the quality of the instruments. For CIT and CAW, the instruments are both valid and relevant, as indicated by the J Statistic p-value (testing overidentifying restrictions) and the minimum eigenvalue statistic (testing the correlation between $\tau_{i,t}^{\#}$ and the instruments), respectively. The low value of the latter statistic suggests that the instruments for ITC are weak.

In sum, the results from Tables 2 and 3 suggest that the slopes of the reaction function for CIT and CAW are negative and confirm the importance of tax competition in determining these capital tax policies. Though a negatively-sloping reaction function may seem counter-intuitive, it is not inconsistent with the theory of strategic tax competition and has been found previously in other empirical work (Brueckner and Saavedra, 2001; Chirinko and Wilson, 2009). The intuition for a negative slope from a model of strategic tax competition is as follows. Suppose the out-of-state tax rate rises. This increase will cause mobile capital to flow into the state in question, raising the state's tax base. If the income elasticity of residents' demand for public goods (relative to private goods) is negative, residents may prefer to use this "windfall" to finance a tax cut, which would represent a negative-sloping reaction function. In this case, residents view existing public services as adequate and recognize that, with their now-larger tax base, they can maintain the existing level of public services at a lower tax rate and shift consumption toward more private goods.

The Role of Business Campaign Contributions

The unique contribution of this study is to quantify the role of business campaign contributions on business tax policy. This impact is investigated by estimating equation [2] via GMM and assessing the sign, magnitude, and statistical significance of the estimated γ's. The results based on the RE and FE models are shown in Tables 4 and 5, respectively. The $\tau_{i,t}^{\#}$ variable is treated as endogenous in all models, using the same instruments for $\tau_{i,t}^{\#}$ as used in the regressions underlying columns 4-6 of Tables 2 and 3. The $BCC_{i,t}$ 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 $BCC_{i,t}$ and $BCC_{i,t-1}$, and their sum represented by γ, have been multiplied by 1,000 to facilitate presentation.

We find that the introduction of the business contributions variables has little effect on the slope of the reaction function. The slope coefficients could have been affected indirectly due to omitted variables bias stemming from incorrectly excluding BCC. However, the αs reported in Table 4 are very similar to those in columns 4 to 6 of Table 2, and likewise for the αs from Table 5 in comparison to those from Table 3.

We also find that business campaign contributions do affect tax policy in a direction favorable to business. As shown in Panel B of Tables 4 and 5, the sign of the estimated γ is negative for CIT and CAW, the two tax "rates" that increase business costs, and it is positive for ITC, the tax policy that lowers business costs. This pattern holds for both the RE model and FE models. In the RE model (Table 4), γ is statistically significant (at conventional levels) for both CIT and CAW, but not for ITC. In the FE model, γ remains significant for CAW, has a p-value slightly above 0.10 for CIT, and remains insignificant for ITC.

The economic significance of these estimates will be assessed in the following section. Here we simply note that the estimated γ from column 4 of Table 5 implies that a one standard deviation (s.d.) movement of BCC is associated with a reduction in CIT of just 0.05 percentage points (p.p.), which is 2% of the standard deviation of CIT. Similar magnitudes are implied by the estimated γ for each of the other two tax variables (from Columns 5 and 6 of Table 5): A one s.d. movement of BCC is associated with an increase in the ITC of 0.09 p.p. (4% of the ITC s.d.) and a decrease in the CAW of 0.98 p.p. (8% of the CAW s.d.). As we show in following section, however, even such small movements in tax rates can imply large movements in business profits, making business campaign contributions a worthwhile investment.

Extensions

This subsection extends our empirical results in four directions. First, we have thus far measured BCC as contributions to candidates for state houses of representatives because house elections are held every two years and, relative to senate and gubernatorial elections, a continuity exists across time and states in terms of the fraction of house seats up for election each cycle. Nonetheless, here we consider whether the results are robust to using a broader measure that includes contributions to senate and gubernatorial candidates as well. This broader measure yields similar results. For instance, the reaction function slopes estimated with the RE model and BCC treated as endogenous are -0.303 ($p = 0.468$), -0.108 ($p = 0.918$), and -0.760 ($p = 0.135$) for CIT, ITC, and CAW, respectively. These estimates are very similar to the corresponding results in Columns 4 to 6 of Table 4. The estimated γs are also similar, although the sign for the ITC regression is now negative (though, as before, the coefficient sum remains statistically insignificant). Specifically, the estimated γs are -0.337 ($p = 0.064$), -0.372 ($p = 0.657$), and -6.013 ($p = 0.001$) for CIT, ITC, and CAW, respectively.

Second, we explore whether BCC for winning house candidates has differential effects on tax policy than BCC for losing house candidates. We find statistically insignificant differences, though this result is driven by the large standard errors on the estimated $\gamma^{winning}$ and γ^{losing} coefficients rather than economically similar point estimates. This imprecision appears to be traceable to the substantial collinearity between BCC for winning and losing candidates.

Third, the econometric specifications of tax competition models considered above focused on tax variables directly controlled by policymakers. However, as noted in the Panel Dataset section, these legislated tax variables do not provide a comprehensive measure of the total tax assessed on capital and may not reflect some nuances in the tax code that affect capital taxation. Table 6 presents results with the average corporate tax rate (ATR) as the tax variable for both random and fixed effects specifications and with BCC assumed either exogenous or endogenous. The reaction function slopes continue to be negative, though they are not estimated very precisely. By contrast, the impact of BCC on ATR is greater than on CIT. Relative to the comparable coefficient sums in Tables 4 and 5, the γs from Table 6 are larger -- they imply that a one s.d. movement of BCC is associated with a reduction in ATR of 7% to 9% of the s.d. of ATR -- and they are estimated more precisely.

Fourth, a major advantage of panel data is that the econometric model can control for state-specific effects that are time invariant. If these effects are important for tax policy and correlated with other factors entering the econometric equation, ignoring their impact, as must be done in cross-section regressions, can lead to very different estimates. To explore the importance of state-specific effects, we reestimate our models without controlling for random or fixed effects. The results are radically different. For example, recall that γ^{CIT} is approximately −0.390 when either random or fixed effects are included in the specification (when BCC is assumed endogenous). When state effects are removed, γ^{CIT} rises dramatically; the estimated sum is 0.921 and less precisely estimated. The positive coefficient implies a perverse result that business campaign contributions are associated with higher corporate income tax rates. Similarly substantial changes occur for γ^{ITC} equal to −2.113 (p = 0.136) and γ^{CAW} equal to −10.185 (p = 0.010). These results highlight the critical importance of controlling for state effects in panel data.

THE ECONOMIC VALUE OF BUSINESS CAMPAIGN CONTRIBUTIONS

Up to this point, we have not explored the economic value implied by the BCC coefficients. How much does a dollar of business contributions "buy" in terms of reduced taxes? We answer this question with respect to an implied change in the corporate income tax rate. We focus here only on CIT because the results reported above suggest that BCC does not have a statistically significant effect on ITC and interpreting the corporate tax savings from a change in CAW is complicated given it necessarily involves an offsetting increase in the sales or payroll factor weights. Moreover, the CIT is generally considered the most important capital tax policy.

We begin with the following equation for corporate taxes paid,

$$[3] \quad SCITP_i = CIT_i * RAS_i * \$PROFITS_i ,$$

where $SCITP_i$ is state corporate income tax payments in state i, CIT_i is the statutory corporate income tax rate that enters our econometric equation, RAS_i is the ratio of the average tax rate to the statutory rate, and $\$PROFITS_i$ is the dollar value of before-tax corporate profits. Recall that BCC_i is the logarithm of per capital business contributions, $BCC_i \equiv \ln(\$BCC_i / POP_i)$, where $\$BCC_i$ is the dollar amount of business campaign contributions and POP_i is state population. The economic value of a business contribution (\$BCC) is given by the induced savings in state corporate income tax payments (Δ_i),

[4] $\Delta_i \equiv \partial SCITP_i / \partial \$BCC_i = (\partial CIT_i / \partial \$BCC_i) * RAS_i * \$PROFITS_i$,

where we have assumed that the ratio of average to statutory tax rates and before-tax profits are unaffected by the change in the statutory corporate tax rate. The $(\partial CIT_i / \partial \$BCC_i)$ derivative equals γ divided by $\$BCC_i$. The RAS_i variable is assumed to be the same across states ($RAS_i = RAS$ for all i) because it is measured with national data. Furthermore, we approximate $\$PROFITS_i$ for a given state as national profits, $\$PROFITS$, multiplied by the state's population share (POP_i / POP). Lastly, we average over the 48 states to calculate the impact of business contributions for the representative state to obtain the economic value of business contributions,

[5]
$$\begin{aligned} \Delta &\equiv \sum_{i=1}^{48} \Delta_i / 48 = \gamma * \left(\left(\sum_{i=1}^{48} POP_i / \$BCC_i \right) / 48 \right) * RAS * (\$PROFITS / POP) \\ &= \gamma * MEAN\{POP_i / \$BCC_i\} * RAS * (\$PROFITS / POP) \end{aligned}$$
.

The elements appearing in equations [5] are quantified as follows. The γ coefficient is taken from column 4 of Table 5 (divided by 1,000, per the notes to Tables 4 and 5). The $\$PROFITS$ variable is corporate profits before tax without the inventory valuation and corporate capital adjustment for the aggregate economy (U.S. Department of Commerce, *Survey of Current Business,* Table 1.12) averaged for the period 2004 to 2006 ($1,566,300 million). (All averages in this paragraph are for this period.)[7] The average of the POP variable (Bureau of the Census website) is 293.43 million. The RAS variable is a ratio. The numerator is computed for the aggregate economy as state tax receipts on corporate income (U.S. Department of Commerce, *Survey of Current Business*, Table 3.3) divided by the above figure for aggregate corporate profits before tax. The denominator is CIT. The RAS variable is the average of this ratio and equals 0.52. In 2006, $MEAN\{POP_i / \$BCC_i\}$ is 3.68.

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[7] We focus on this three year average, rather than the mean for the full sample, because of the secular decline in state corporate income tax payments (Wilson, 2006).

Based on these numbers and the formula above, business campaign contributions appear to have considerable economic value. A $1 campaign contribution yields $3.83 in state corporate tax savings. The result is very similar – $4.03 – if one instead uses the RE estimate of γ (from column 4 of Table 4).

These figures beg the question, if the value of $1 of business campaign contributions is greater than $1, why do businesses not contribute more, raising contributions until the point at which the excess return is eliminated?[8] There are two possible explanations, which are not mutually-exclusive, to this "Tullock Puzzle" (1972). First, while we have interpreted this estimated economic value as the benefit resulting from a marginal contribution of a representative business, it may reflect behavior conditional on other businesses also contributing. No mechanism exists, however, for ensuring these mutual gains are realized (much like in the classic "Tragedy of the Commons" problem).[9] We have been treating the business sector as a single profit-maximizing agent, but a richer model would recognize that it is comprised of numerous individual businesses that fail to coordinate in a mutually beneficial way. The excess return to business contributions may reflect coordination failure among businesses. Second, campaign contribution limits may effectively constrain businesses from increasing campaign contributions to the point where their value equals their cost.

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, the capital apportionment weight, and the average corporate tax rate. Our empirical model explains each of these tax policies as functions of tax policies in

[8] Our results contribute to the lively debate concerning whether campaign contributions are an investment by firms for political influence or consumption by participants in the political process. See the survey by Ansolabehere, de Figueiredo, and Snyder (2003) and the evidence that they present in favor of the consumption view. Recent results by Cooper, Gulen, and Ovtchinnikov (2009) favor the investment view; they find a large positive impact of business contributions to federal elections on returns. By contrast, Aggarwal, Meschke, and Wang (2008) find that business contributions to federal elections are negatively related to future returns because of a link between contributions and corporate governance problems.

[9] Hardin (1968) and Olson (1965) discuss the difficulties faced by groups in achieving their common interests, though Ostrom (1990) takes a more sanguine view based on the evolution of institutions.

competitive states (reflecting the usual role of tax competition) and business contributions, as well as control variables for the economic and political environment, state effects, and time fixed effects.

Based on a panel of U.S. states and unique data on business campaign contributions, our empirical work uncovers four key results. First, we document a significant direct effect of business contributions on tax policy. Second, the economic value of a $1 business campaign contribution in terms of lower state corporate taxes is nearly $4. Third, the slope of the reaction function between tax policy in a given state and the tax policies of its competitive states is negative. Fourth, we highlight the sensitivity of the empirical results to state effects.

These provocative results call for further research aimed at understanding the determinants of business campaign contributions and the "Tullock Puzzle," the persistence of such large gaps between benefits and costs. What constraints prevent businesses from making additional contributions and exploiting these huge benefits? Are campaign contribution limits effective in constraining business campaign contributions? We intend to examine these and related issues in future research.

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

Business Campaign Contributions

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 statement 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.

The NIMSP provided us with the “Summary File” for each state and invaluable explanations of details about their data. 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 9 sectors: agriculture; construction; communications and electronics; defense; energy and natural resources; finance, insurance, and real estate; general business; transportation; and health.[10]

We first aggregate contributions across these 9 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, lieutenant 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 lieutenant governor because in some states these candidates are listed on a joint ticket and so it is not possible for NIMSP to separate contributions between the governor candidate and lieutenant 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, legislative candidates' offices are coded as "senate."

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

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

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

Explanatory Variables

BCC^H – business contributions-house

BCC^S – business contributions-senate

BCC^G – business contributions-governor/lieutenant governor

BCC^{HSG} – business contributions-house + senate + governor

Candidate Instrumental Variables

NBC^W – non-business contributions-house-GE winners

NBC^L – non-business contributions-house-GE losers

NBC – non-business contributions-house-GE winners + GE losers

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:	Number 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 categorized into four 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.

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 close to 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 constructed at an annual frequency is appropriate for the purposes of our regression analysis.

Campaign Contributions Limits

There are at least six different kinds of campaign contribution limits (CCLs): (1) 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) on contributions by political parties.

The basic principle we use for constructing a uniform panel of data for these six types of CCLs is as follows: "What is the maximum amount that a contributor (individual, corporation, candidate, PAC, union, or party) could make 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 to record in our dataset), 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 used to enter this information in our dataset 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 higher limits apply.

Our data sources for CCLs are as follows:

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: 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	

REFERENCES

Aggarwal, Rajesh K., Meschke, Felix, and Wang, Tracy. "Corporate Political Contributions: Investment or Agency?" University of Minnesota. 2008.

Ansolabehere, Stephen, de Figueiredo, John M., Snyder, James M., Jr. "Why Is There So Little Money in U.S. Politics?" *Journal of Economic Perspectives*, 2003, 17, no. 1, pp.105-130.

Brueckner, Jan K. "Strategic Interaction Among Governments: An Overview of Empirical Studies." *International Regional Science Review*, 2003, 26, no. 2, pp. 175-88.

Brueckner, Jan K., and Luz A. Saavedra. "Do Local Governments Engage In Strategic Property-Tax Competition? " *National Tax Journal*, 2001, 54, no. 2, pp. 203-29.

Case, Anne C., Harvey S. Rosen, and James R. Jr. Hines. "Budget Spillovers and Fiscal Policy Interdependence: Evidence From the States." *Journal of Public Economics*, 1993, 52, no. 3, pp. 285-307.

Chirinko, Robert S., and Wilson, Daniel J. "State Investment Tax Incentives: A Zero-Sum Game?" *Journal of Public Economics*, 92. 2008, pp. 2362-2384.

Chirinko, Robert S., and Wilson, Daniel J. "Tax Competition among U.S. States: Racing to the Bottom or Riding on a Seesaw?" University of Illinois at Chicago and Federal Reserve Bank of San Francisco Working Paper No. 2008-03, 2009.

Cooper, Michael J., Gulen, Huseyin, and Ovtchinnikov, Alexei V. "Corporate Political Contributions and Stock Returns." University of Utah/Purdue University/Vanderbilt University. 2009.

Devereux, Michael P., Ben Lockwood, and Michela Redoano. "Do Countries Compete Over Corporate Tax Rates?" *Journal of Public Economics*. 91, 2007, pp. 451-479.

Donald, Stephen G., and Newey, Whitney K. "Choosing the Number of Instruments." *Econometrica*, 69, no. 5. 2001, pp. 1161-1191.

Edmiston, Kelly D. (1998). "Formula-Apportioned Corporate Income Taxes and Regional Economic Development." Doctoral Dissertation, University of Tennessee.

Edwards, Jeremy, and Keen, Michael, "Tax Competition and Leviathan." *European Economic Review*, 40. 1996, pp. 113-134.

Federation of Tax Administrators (1997). "State Apportionment of Corporate Income," Accessed 1997 at http://www.taxadmin.org/fta/rate/corp_app.html.

Grossman, Gene M., and Helpman, Elhanan. "Protection for Sale." *American Economic Review*, September 1994, 84, No. 4, pp. 833-850.

Hansen, Lars P. “Large Sample Properties of Generalized Method of Moments Estimators.” *Econometrica*, 1982, 50, 1029-54.

Hardin, Garrett. “Tragedy of the Commons.” *Science*, 1968, 162, pp. 1243-1248.

Olson, Mancur. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, Massachusetts: Harvard University Press, 1965.

Omer, Thomas C., and Marjorie K. Shelley. Competitive, Political, and Economic Factors Influencing State Tax Policy Changes” Journal of American Tax Association, 2004, 26, Supplement, pp. 103-126.

Ostrom, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, England, 1990.

Stock, James H., Wright, Jonathan H., and Yogo, Motohiro. "A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments." *Journal of Business & Economic Statistics*, 2002, 20, 518-529.

Stock, James H., and Yogo, Motohiro. "Testing for Weak Instruments in Linear IV Regression," in Donald W.K. Andrews and James H. Stock (eds.). *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg* (Cambridge: Cambridge University Press, 2005), 80-108.

Tullock, Gordon. “The Purchase of Politicians.” *Western Economic Journal*, 10, 354-355.

U.S. Bureau of the Census, U.S. Department of Commerce. URL: http://www.census.gov.

U.S. Department of Commerce, *Survey of Current Business.* URL: http://www.bea.gov.

White, Halbert. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica*, 1980, 48, 817-838.

Wilson, Daniel J. “The Mystery of Falling State Corporate Income Taxes” Federal Reserve Bank of San Francisco *Economic Letter* 2006-35.

TABLE 1
SUMMARY STATISTICS
SAMPLE PERIOD: 1990-2006

	Mean	SD	Quartiles 25%	Quartiles 50%	Quartiles 75%
	(1)	(2)	(3)	(4)	(5)
A. Business Contributions					
$BCC^{H}_{i,t}$	0.234	0.345	0.000	0.000	0.408
$BCC^{S}_{i,t}$	0.160	0.260	0.000	0.000	0.268
$BCC^{G}_{i,t}$	0.256	0.560	0.000	0.000	0.208
$BCC^{HSG}_{i,t}$	0.651	1.012	0.000	0.000	1.053
B. Tax Variables					
$CIT_{i,t}$	0.064	0.028	0.050	0.070	0.085
$CIT^{\#}_{i,t}$	0.067	0.007	0.063	0.066	0.071
$ITC_{i,t}$	0.013	0.024	0.000	0.000	0.020
$ITC^{\#}_{i,t}$	0.015	0.005	0.012	0.014	0.018
$CAW_{i,t}$	0.207	0.120	0.125	0.250	0.250
$CAW^{\#}_{i,t}$	0.210	0.024	0.191	0.209	0.227
$ATR_{i,t}$	0.014	0.010	0.008	0.011	0.017
$ATR^{\#}_{i,t}$	0.009	0.001	0.008	0.009	0.010
C. Control Variables					
$IK_{i,t-1}$	0.110	0.029	0.090	0.107	0.124
$VOTERPREFERENCES_{i,t-1}$	0.468	0.370	0.000	0.500	0.500
$IK^{\#}_{i,t-1}$	0.109	0.014	0.096	0.109	0.121

Notes to Table 1:
There are 522 observations for each variable. In panel A, the business campaign contributions variables ($BCC^{x}_{i,t}$) 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 ($ITC_{i,t}$), the capital apportionment weight ($CAW_{i,t}$), and the average corporate tax rate ($ATR_{i,t}$). The tax variables with a superscript # are tax variables in the competitive states, where the competitive set of states is the other 47 contiguous 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 $ITC^{\#}_{i,t}$, $CAW^{\#}_{i,t}$, and $ATR^{\#}_{i,t}$ 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, 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, and $IK^{\#}_{i,t-1}$. See the section The Panel Dataset and the Appendix for further details about data sources and construction.

TABLE 2

TAX COMPETITION -- BASELINE MODEL, STATE RANDOM EFFECTS

DEPENDENT VARIABLE: $\tau_{i,t}$

OLS AND GMM ESTIMATES

	$\tau^{\#}_{i,t}$ Exogenous			$\tau^{\#}_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-1.624	-0.817	-1.308	-0.730	0.093	1.503
	{0.019}	{0.123}	{0.022}	{0.651}	{0.982}	{0.454}
$\tau^{\#}_{i,t-1}$	0.778	0.278	0.391	-0.082	-0.520	-1.742
	{0.389}	{0.688}	{0.589}	{0.959}	{0.882}	{0.286}
$\tau^{\#}_{i,t-2}$	0.593	0.063	-0.359	0.597	0.145	-0.469
	{0.362}	{0.904}	{0.526}	{0.359}	{0.801}	{0.424}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$ s	-0.253	-0.477	-1.276	-0.214	-0.282	-0.708
	{0.443}	{0.372}	{0.000}	{0.592}	{0.755}	{0.162}
B. Control Variables						
$IK_{i,t-1}$	0.008	0.019	-0.040	0.008	0.016	-0.019
	{0.305}	{0.322}	{0.566}	{0.286}	{0.533}	{0.798}
$VOTERPREFERENCES_{i,t-1}$	0.001	-0.004	0.010	0.001	-0.004	0.007
	{0.427}	{0.029}	{0.147}	{0.420}	{0.032}	{0.294}
$IK^{\#}_{i,t-1}$	-0.111	0.215	-0.694	-0.115	0.171	-0.228
	{0.074}	{0.172}	{0.227}	{0.064}	{0.599}	{0.736}
C. Equation Fit and Instrument Quality						
R^2	0.114	0.054	0.315	-----	-----	-----
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	522	522	522	522	522	522

TABLE 3
TAX COMPETITION -- BASELINE MODEL, STATE FIXED EFFECTS
DEPENDENT VARIABLE: $\tau_{i,t}$
OLS AND GMM ESTIMATES

	$\tau^{\#}_{i,t}$ Exogenous			$\tau^{\#}_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-2.657	-0.863	-1.262	-1.864	0.919	2.218
	{0.014}	{0.180}	{0.116}	{0.356}	{0.767}	{0.087}
$\tau^{\#}_{i,t-1}$	0.871	0.284	0.392	0.296	-1.217	-2.148
	{0.358}	{0.463}	{0.390}	{0.895}	{0.671}	{0.054}
$\tau^{\#}_{i,t-2}$	-0.116	0.107	-0.438	0.156	0.280	-0.613
	{0.870}	{0.598}	{0.326}	{0.875}	{0.490}	{0.144}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$ s	-1.902	-0.473	-1.307	-1.411	-0.017	-0.543
	{0.184}	{0.491}	{0.060}	{0.088}	{0.977}	{0.134}
B. Control Variables						
$IK_{i,t-1}$	0.006	0.021	-0.031	0.006	0.012	0.006
	{0.527}	{0.251}	{0.754}	{0.342}	{0.413}	{0.941}
$VOTERPREFERENCES_{i,t-1}$	0.001	-0.003	0.010	0.001	-0.003	0.013
	{0.436}	{0.185}	{0.512}	{0.170}	{0.011}	{0.088}
$IK^{\#}_{i,t-1}$	-0.100	0.270	-0.496	-0.106	0.119	0.169
	{0.252}	{0.342}	{0.374}	{0.052}	{0.620}	{0.701}
C. Equation Fit and Instrument Quality						
p-Value for the J Statistic	-----	-----	-----	0.696	0.411	0.131
Eigenvalue Statistic for $\tau^{\#}_{i,t}$	-----	-----	-----	20.911	4.980	10.894
R^2	0.138	0.055	0.316	-----	-----	-----
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	522	522	522	522	522	522

Notes To Tables 2 and 3:
OLS (columns 1 to 3) and GMM (columns 4 to 6) estimates are based on equation [2] with panel data for 48 states for the period 1990 to 2006. Missing observations for the business campaign contributions data and outliers reduce the sample to 522 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. All models contain state effects (either random or fixed) and time fixed effects. The α parameter measures the long-run impact of a change in $\tau^{\#}_{i,t}$ and is defined in equation [2] as the sum of the 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., 10%) 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 results estimated in Tables 2 and 3, an eigenvalue statistic greater than 10.9 or 18.4 rejects the null hypothesis constructed with a bias of 10% or 5%, respectively. The instruments for $\tau^{\#}_{i,t}$ differ for each of the three tax variables. For $CIT_{i,t}$, the instruments consist of the first-order and second-order spatial lags of a dummy variable indicating the reelection of a Republican (R) governor in the prior year and the first-order and second-order spatial lags of an interaction between a R governor dummy and a Democratic/Independent (DI) party controlled legislature dummy. For $ITC_{i,t}$, the instruments consist of the first-order spatial lags of the R governor dummy and the interaction mentioned in the previous sentence. For $CAW_{i,t}$, the instruments are the first-order and second-order spatial lags of a dummy indicating the reelection of an incumbent governor in the prior year and the first-order and second-order spatial lags of a dummy indicating a change in governorship party last year from R to DI. The selection of the instrument set is described in the section on The Panel Dataset/Political Variables; the three sets of instruments discussed above correspond to items (g) and (i), (a) and (g), and (d) and (h), respectively, listed in that sub-section. The R^2 statistic measures the fraction of total variation measured by the model, including that explained by state and year fixed effects.

TABLE 4

ROLE OF BUSINESS CAMPAIGN CONTRIBUTIONS, STATE RANDOM EFFECTS

DEPENDENT VARIABLE: $\tau_{i,t}$

GMM ESTIMATES

	$BCC_{i,t}$ Exogenous			$BCC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-0.587	0.965	0.929	-0.554	0.946	0.938
	{0.719}	{0.787}	{0.640}	{0.731}	{0.792}	{0.636}
$\tau^{\#}_{i,t-1}$	-0.140	-1.405	-1.518	-0.177	-1.388	-1.523
	{0.931}	{0.641}	{0.344}	{0.912}	{0.645}	{0.342}
$\tau^{\#}_{i,t-2}$	0.506	0.272	-0.340	0.495	0.269	-0.342
	{0.440}	{0.626}	{0.553}	{0.449}	{0.629}	{0.551}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$ s	-0.221	-0.168	-0.930	-0.236	-0.173	-0.927
	{0.587}	{0.856}	{0.067}	{0.565}	{0.853}	{0.068}
B. Business Contributions						
$BCC_{i,t}$	-0.166	0.312	-2.974	-0.204	0.308	-2.926
	{0.113}	{0.379}	{0.006}	{0.074}	{0.460}	{0.012}
$BCC_{i,t-1}$	-0.166	0.450	-3.772	-0.191	0.447	-3.740
	{0.097}	{0.184}	{0.000}	{0.068}	{0.237}	{0.000}
γ = Sum of Coefficients on the $BCC_{i,t}$ s	-0.332	0.762	-6.747	-0.395	0.755	-6.665
	{0.079}	{0.254}	{0.000}	{0.053}	{0.328}	{0.001}
C. Control Variables						
$IK_{i,t-1}$	0.009	0.011	-0.002	0.009	0.011	-0.002
	{0.225}	{0.643}	{0.982}	{0.215}	{0.640}	{0.981}
$VOTERPREFERENCES_{i,t-1}$	0.001	-0.003	0.007	0.001	-0.003	0.007
	{0.452}	{0.047}	{0.312}	{0.452}	{0.047}	{0.312}
$IK^{\#}_{i,t-1}$	-0.098	0.098	0.023	-0.095	0.099	0.021
	{0.115}	{0.743}	{0.972}	{0.129}	{0.737}	{0.974}
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	522	522	522	522	522	522

TABLE 5

ROLE OF BUSINESS CAMPAIGN CONTRIBUTIONS, STATE FIXED EFFECTS

DEPENDENT VARIABLE: $\tau_{i,t}$

GMM ESTIMATES

	$BCC_{i,t}$ Exogenous			$BCC_{i,t}$ Endogenous		
	CIT	ITC	CAW	CIT	ITC	CAW
	(1)	(2)	(3)	(4)	(5)	(6)
A. Neighboring States Tax Variable						
$\tau^{\#}_{i,t}$	-1.474	1.298	1.873	-1.431	1.330	1.866
	{0.484}	{0.670}	{0.141}	{0.492}	{0.660}	{0.143}
$\tau^{\#}_{i,t-1}$	-0.037	-1.682	-2.089	-0.073	-1.707	-2.081
	{0.987}	{0.536}	{0.057}	{0.974}	{0.526}	{0.058}
$\tau^{\#}_{i,t-2}$	0.157	0.348	-0.512	0.155	0.350	-0.512
	{0.869}	{0.375}	{0.212}	{0.871}	{0.370}	{0.213}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$ s	-1.354	-0.035	-0.728	-1.350	-0.027	-0.727
	{0.104}	{0.956}	{0.043}	{0.106}	{0.968}	{0.043}
B. Business Contributions						
$BCC_{i,t}$	-0.169	0.274	-2.957	-0.196	0.256	-2.992
	{0.144}	{0.405}	{0.004}	{0.122}	{0.524}	{0.009}
$BCC_{i,t-1}$	-0.159	0.398	-3.630	-0.178	0.384	-3.660
	{0.164}	{0.283}	{0.002}	{0.151}	{0.364}	{0.003}
γ = Sum of Coefficients on the $BCC_{i,t}$ s	-0.328	0.672	-6.587	-0.375	0.640	-6.652
	{0.146}	{0.331}	{0.001}	{0.130}	{0.435}	{0.002}
C. Control Variables						
$IK_{i,t-1}$	0.007	0.009	0.032	0.007	0.009	0.031
	{0.260}	{0.514}	{0.662}	{0.250}	{0.509}	{0.664}
$VOTERPREFERENCES_{i,t-1}$	0.001	-0.003	0.011	0.001	-0.003	0.011
	{0.212}	{0.017}	{0.143}	{0.215}	{0.017}	{0.145}
$IK^{\#}_{i,t-1}$	-0.090	0.069	0.443	-0.087	0.069	0.449
	{0.107}	{0.753}	{0.316}	{0.127}	{0.751}	{0.314}

D. Instrument Quality						
p-Value for the J Statistic	0.791	0.342	0.172	0.798	0.343	0.172
Eigenvalue Statistic	20.304	5.285	10.670	16.585	3.543	8.546
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	522	522	522	522	522	522

Notes To Table 4 and 5:
GMM estimates are based on equation [2]. Columns 1, 2, and 3 treat $BCC_{i,t}$ as an exogenous variable; columns 4, 5, and 6 treat $BCC_{i,t}$ as an endogenous variable. (The $\tau^{\#}_{i,t}$ variable is treated as endogenous in all models reported in Tables 4 and 5.) The $BCC_{i,t}$ 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 2-3 for details about the table entries. The instrument for $BCC_{i,t}$ is the number of candidates that ran for a state house seat. The selection of the instrument set is described in the section on The Panel Dataset/Business Campaign Contributions Variables; the instrument discussed above corresponds to item (b) listed in that sub-section. The coefficients for $BCC_{i,t}$, $BCC_{i,t-1}$, and γ are multiplied by 1,000 to facilitate presentation. For the models reported in Tables 4 and 5, an eigenvalue statistic greater than 8.8 or 14.0 rejects the null hypothesis of instrument irrelevance constructed with a bias of 10% or 5%, respectively.

TABLE 6

ALTERNATIVE TAX MEASURE: AVERAGE CORPORATE TAX RATE

DEPENDENT VARIABLE: $\tau_{i,t}$

GMM ESTIMATES

	$BCC_{i,t}$ Exogenous		$BCC_{i,t}$ Endogenous	
	Random Effects	Fixed Effects	Random Effects	Fixed Effects
	(1)	(2)	(3)	(4)
A. Neighboring States Tax Variable				
$\tau^{\#}_{i,t}$	1.337	1.089	1.341	1.093
	{0.230}	{0.229}	{0.229}	{0.228}
$\tau^{\#}_{i,t-1}$	-1.569	-1.213	-1.566	-1.219
	{0.041}	{0.038}	{0.041}	{0.037}
$\tau^{\#}_{i,t-2}$	-0.646	-0.384	-0.652	-0.403
	{0.152}	{0.271}	{0.148}	{0.248}
α = Sum of Coefficients on the $\tau^{\#}_{i,t}$ s	-0.878	-0.509	-0.878	-0.528
	{0.185}	{0.395}	{0.186}	{0.379}
B. Business Contributions				
$BCC_{i,t}$	-0.202	-0.194	-0.250	-0.253
	{0.079}	{0.060}	{0.047}	{0.040}
$BCC_{i,t-1}$	-0.290	-0.287	-0.323	-0.327
	{0.007}	{0.004}	{0.004}	{0.004}
γ = Sum of Coefficients on the $BCC_{i,t}$ s	-0.492	-0.481	-0.572	-0.580
	{0.016}	{0.013}	{0.010}	{0.011}
C. Control Variables				
$IK_{i,t-1}$	0.030	0.029	0.030	0.029
	{0.000}	{0.155}	{0.000}	{0.149}
$VOTERPREFERENCES_{i,t-1}$	-0.001	-0.001	-0.001	-0.001
	{0.133}	{0.156}	{0.130}	{0.151}
$IK^{\#}_{i,t-1}$	-0.036	-0.030	0.032	0.024

	{0.572}	{0.587}	{0.622}	{0.665}
D. Instrument Quality				
p-Value for the J Statistic	-	0.843	-	0.775
Eigenvalue Statistic	-	17.720	-	0.482
Number of Observations	522	522	522	522

Notes To Table 6:
GMM estimates are based on equation [2]. Columns 1 and 2 treat $BCC_{i,t}$ as an exogenous variable; columns 3 and 4 treat $BCC_{i,t}$ as an endogenous variable. (The $\tau^{\#}_{i,t}$ variable is treated as endogenous in all models reported in Table 6.) See the Notes to Tables 1, 2-3, and 4-5 for details about the table entries. The coefficients for $BCC_{i,t}$, $BCC_{i,t-1}$, and γ are multiplied by 1,000 to facilitate presentation.