The structure of state corporate taxation and its impact on state tax revenues and economic activity ☆

Juan Carlos Suárez Serrato [a,b,*], Owen Zidar [b,c]

[a] Duke University, United States of America
[b] NBER, United States of America
[c] Princeton University, United States of America

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ABSTRACT

This paper documents facts about the state corporate tax structure — tax rates, base rules, and credits — and investigates its consequences for state tax revenue and economic activity. We present three main findings. First, tax base rules and credits explain more of the variation in state corporate tax revenues than tax rates do. Second, although states typically do not offset tax rate changes with base and credit changes, the effects of tax rate changes on tax revenue and economic activity depend on the breadth of the base. Third, as states have narrowed their tax bases, the relationship between tax rates and tax revenues has diminished. Overall, changes in state tax bases have made the state corporate tax system more favorable for corporations and are reducing the extent to which tax rate increases raise corporate tax revenue.

How states tax businesses has received renewed interest in both academic and policy circles? Recent work on state corporate tax rates has investigated their impacts on income growth, employment, and business location.[1] However, state policymakers compete to attract businesses not only by changing tax rates, but also by changing the tax base to enhance several investment incentives, loss provisions, and enforcement mechanisms.[2] There is a lack of basic facts about the state corporate tax structure, its evolution over recent years, and how it impacts tax revenue and economic activity. This paper describes the state corporate tax structure, documents how it has changed over time, and investigates the consequences of these changes for state tax collections and economic activity.

Our analysis proceeds in four steps. We first describe recent trends in state corporate tax structure.[3] While average state corporate tax rates have remained relatively stable, state corporate tax revenues as a share of economic activity have declined substantially. Some of this decline is due to other factors (e.g., the rise of pass-throughs (Cooper et al., 2016) and corporate losses (Auerbach and Poterba, 1987)), but we show that tax base and credit changes have substantial impacts on state corporate tax collections. Tax base and credit changes are much more frequent than tax rate changes. Contrary to the view that state tax rate changes are often accompanied by offsetting changes in the tax base, we find that the vast majority of tax base changes are not associated with tax rate changes. Some provisions, such as R&D credits, investment tax credits, and loss carryforward rules, have become more favorable for corporations while others (e.g., throwback rules and combined reporting) have lead to broader bases.

Second, we estimate the importance of each of these tax base rules for state corporate tax collections from 1980 and 2010. We perform analysis of variance decompositions every five years and

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[1] Recent papers include Heider and Ljungqvist (2015), Giroud and Rauh (2015), Suárez Serrato and Zidar (2016), Fajgelbaum et al. (2015), Ohrn (2016), and Ljungqvist and Smolyansky (2014).

[2] These tax base rules are important determinants of measures of state business climate indexes (*e.g.*, Tax Foundation, 2016). ALEC (2014) reports that 14 states changed taxes in 2014 with many of the changes affecting both tax rates as well as tax base determinants.

[3] The fifteen determinants of the corporate income tax structure that we analyze include tax credits, such as the investment tax credit and the R&D tax credit. For simplicity, we refer to these credits as determinants of the tax base, along with our other tax base measures.

document the importance of tax base rules, relative to tax rates, in explaining the variation in corporate tax revenue across states and over time. Overall, tax base components account for the majority of the explained variation in tax revenues. This result remains relatively stable throughout most of our sample, with only a slight increase in the fraction explained by tax rates in 2010. The importance of different tax base components in explaining tax revenues has evolved over our sample. In particular, sales apportionment weights and loss carryback provisions have waned in importance, while franchise taxes, different depreciation rules, and interactions with federal tax policies, such as adopting the federal tax base or allowing for the deductibility of federal taxes, have increased their share of explained variance.

Third, we analyze how tax base provisions affect the relationship between state tax rates and two outcomes: state corporate tax revenue and state GDP. This analysis has two parts. We first explore the degree to which *controlling for these tax base provisions* affects the relationship between tax rates and revenue and GDP. We find that, while tax base controls explain a large portion of the variation in revenues, the relationships between tax rates and our outcomes of interest are not fundamentally affected by controlling for these tax base measures. This result may be due to the lack of a temporal coincidence between changes to tax rates and determinants of the tax base. However, even if tax base and rate changes do not occur at the same time, the tax base can influence the effects of tax rate changes.

We then explore the extent to which *interactions between the tax base and tax rates* induce heterogeneous effects of state corporate tax rate changes. Intuitively, when the tax base is narrow, a tax rate increase mechanically raises less revenue since taxable income is a smaller portion of overall income. In addition, tax changes have smaller incentive effects, so the behavioral responses to tax rate increases are likely attenuated. Empirically, we first confirm that states with narrower tax bases collect less revenue from marginal increases in tax rates. The main finding is about tax-base-driven heterogeneity in the time series. While some states have broadened the base (e.g., Michigan, Ohio, Illinois), we observe narrower tax bases on average over the last thirty years. These trends in state tax bases over time have made the state corporate tax system more generous towards corporations, and are reducing the extent to which increases in tax rates raise corporate tax revenue. In addition, we find that including interactions between the state tax base and state tax rates also increases the estimate of the average treatment effect (ATE) of state corporate tax rate changes on state corporate tax revenue.[4]

We conclude by investigating the implications of these results for revenue-maximizing-state-tax rates and for the claim that state corporate tax rate cuts pay for themselves.[5] We estimate a regression in which tax rates have linear (β_0) and quadratic (δ_0) effects on tax revenue. The revenue-maximizing-state-corporate-tax rate equals the ratio of these effects: $\frac{\beta_0}{-2\delta_0}$. The estimate of the quadratic effect ($\hat{\delta}_0$), which measures decreasing returns from tax rate increases, is not substantially larger than the linear effect ($\hat{\beta}_0$). Our point estimates imply that the tax rate that maximizes state corporate tax revenue is close to 30%. In Suárez Serrato and Zidar (2016), we note that state corporate taxes may have fiscal externalities and may affect tax

revenue from sales and personal income taxes. Even when we allow for this externality by considering total state tax revenue instead of only corporate tax revenue, our estimates imply a total-state-tax-revenue-maximizing rate of close to 10%. Since the estimated revenue-maximizing rate is greater than the majority of state corporate tax rates, we reject the hypothesis that tax cuts tend to pay for themselves.

This paper contributes to three literatures. First, relative to recent work on the effects of changes in state business tax rates on economic activity (Heider and Ljungqvist, 2015; Giroud and Rauh, 2015; Suárez Serrato and Zidar, 2016; Fajgelbaum et al., 2015; Ohrn, 2016, and Ljungqvist and Smolyansky, 2014), we explore how the relationships between tax rates and revenues and economic activity depend on the structure of the corporate tax system. A contribution of this paper is the collection and description of a comprehensive set of variables that describe the structure of the corporate tax system across all U.S. states since 1980, which we hope will aid future researchers in this literature. In a contemporaneous contribution, Bartik (2017) simulates the tax consequences of locating a new plant in 32 states and 45 industries that cover roughly 90% of U.S. economic activity since 1990. These simulations are highly detailed and capture complex interactions between several rules. We view this paper as highly complementary to ours, which takes a reduced-form empirical approach. Specifically, we do not conduct similar simulations at the plant level, but do variance decompositions of observed state corporate tax revenue as a share of state GDP to understand the quantitative importance of different base provisions for state tax revenue. Bartik (2017) also documents several facts about changes in incentives and finds that business incentives are large, vary substantially across states, and have become increasingly generous. Consistent with these results, we document substantial variation across states and a general narrowing of the base on average in the full panel of 50 states since 1980.

Second, this paper is also related to a set of papers that explore whether the tax base affects the relationship between corporate tax rates and corporate income tax revenues. In particular, Clausing (2007), Devereux (2007), and Kawano and Slemrod (2015) study this relationship across 29 OECD member countries, and Dahlby and Ferede (2012) perform a similar analysis across Canadian provinces. We follow Kawano and Slemrod (2015) by collecting a comprehensive set of variables that describe the breadth of the tax base and by controlling for this tax base vector in our estimations. In contrast to Kawano and Slemrod (2015), who focus on the international corporate tax structure, we find that state tax rate changes are not often offset by base and credit changes.

Finally, we find that the relationship between state tax rates and economic activity depends on the structure of the tax base. This point is related to work by Kopczuk (2005), who finds that the elasticity of reported taxable income for individuals depends on the availability of deductions. In our setting, this dependence on the tax base is important for revenue forecasts and assessments of the incidence and efficiency of state corporate taxation.

The paper is organized as follows. Section 1 describes the dataset of tax base determinants, and Section 2 describes trends in the structure of the state corporate tax system. Section 3 performs the variance decomposition analysis, and Section 4 explores the effects of controlling for tax base determinants on various outcomes of economic interest. Section 5 explores tax-base-driven treatment effect heterogeneity across states and over time, Section 6 analyzes the revenue-maximizing-tax rate, and Section 7 concludes with a discussion of policy implications.

1. Measuring the state corporate tax structure

We use fifteen measures of the corporate tax base for the main analysis in the paper. Details on each of the variables, sources, and

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[4] As is well known (Wooldridge, 2005; Gibbons et al., 2014), in the presence of heterogeneous treatment effects, regressions that control for the drivers of heterogeneity estimate a weighted-average of the heterogeneous treatment effects that may not be a consistent estimate of the average treatment effect. In this context, the source of heterogeneous effects is the tax base. We discuss treatment effect heterogeneity in Section 5.

[5] See, for instance, claims by Sam Brownback (Mclean, 2017), Thom Tillis (The News & Observer Editorial Board, 2017), and Mitt Romney (Romney, 2010) for the cases of Kansas, North Carolina, and Massachusetts, respectively, and Rand Paul (Kessler, 2015) for a similar claim at the federal level.