

Does Broadening the Tax Base Affect the Size and Scope of Government?*

Mark Dincecco[†] Ugo Troiano[‡]

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Abstract

We present new evidence about an actual mechanism – the broadening of the tax base – through which modern governments became strong. Our difference-in-differences identification strategy exploits the staggered introduction of the income tax across US states. We find that the tax broadening is associated with 1) a significant increase in total revenues and 2) a significant increase in public expenditures on education and health. We show that fiscal pre-trends do not drive our results. Finally, we test for the role of politics. We find that political ideology significantly influences how policymakers respond to tax broadening. [Yes?](#)

Keywords: taxation, public goods, economic development, politics, US states [Yes?](#)

JEL codes: H11, H41, H71, H75, N42, O23, P16 [Yes?](#)

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[†]University of Michigan; dincecco@umich.edu

[‡]University of Michigan; troiano@umich.edu

1 Introduction

Fiscal capacity is one of the main determinants of state capacity and thus economic development (Besley and Persson, 2013). Increasing fiscal capacity is important for at least two reasons. First, governments provide the administrative infrastructure that supports a well-functioning market economy: secure property rights, market regulations, and quick and fair legal resolution. Second, governments in developed nations provide public goods including education that can make the economy more productive (Barro, 1990, Goldin and Katz, 2008).

Over the past 200 years, there has been major growth in fiscal capacity and public goods provision (Tanzi and Schuknecht, 2000, Lindert, 2004, Besley and Persson, 2013). What underpins this striking trend? History suggests that reducing exemptions and broadening the tax base is key. For example, the elimination of noble tax privileges following the French Revolution (1789-99) was associated with a large increase in the state's ability to tax (Dincecco, 2011). Over the twentieth century, the establishment of the income tax has arguably been the most important part of tax broadening (Wallis, 2000, Besley and Persson, 2013). Still, we lack systematic evidence about the actual fiscal mechanisms through which modern states became strong. Furthermore, we lack systematic evidence about the consequences for public goods – if any – as fiscal capacity increases.

In this paper, we present new evidence on both fronts. We exploit a novel laboratory: twentieth-century US states. The twentieth-century US well represents the growth of the modern state: the tax-to-GNP ratio increased from 8 percent in 1902 to 38 percent by 1992 (Wallis, 2000).¹ We test the consequences of a major institutional reform – the introduction of the state-level income tax – for revenue and spending outcomes. Our difference-in-differences identification strategy exploits the staggered introduction of the income tax from state to state. We can thus identify the causal effects of broadening the tax base on revenue and expenditure outcomes. **Keep “causal” language?** To perform this analysis, we collect data on state-level revenues and expenditures that span the entire twentieth century.

¹These data refer to all levels of government (i.e., local, state, and national). For the state level only, this ratio increased from 1 to 9 percent over this period. Novak (2008) highlights the importance of state governments to long-run state formation in the US.

Importantly, broadening the tax base does not mechanically imply that government size increases. Although tax broadening means that more citizens will be brought into the tax fold, the government may respond by reducing its reliance on other revenue sources, thereby leaving overall government size unchanged (or even reduced). We find that the introduction of the income tax does in fact increase government size on average. Specifically, we show a positive and significant relationship between the introduction of the income tax and 1) per capita income taxes, 2) per capita total taxes, and 3) per capita total revenues. Our estimates indicate that the introduction of the income tax is associated with a 12-14 percent increase in total revenues. [Yes? Over what time frame?](#) We show that fiscal trends prior to the introduction of the income tax do not drive our results.

Furthermore, we find that broadening the tax base has significant policy consequences. We show a positive and significant relationship between the introduction of the income tax and 1) per capita education expenditures, 2) [per capita health expenditures](#), and 3) per capita total expenditures. According to our estimates, the introduction of the income tax is associated with a 10-13 percent increase in total expenditures and a 23-24 percent increase in education expenditures. [Yes?](#) Our results imply that fiscal reform leads to the greater provision of public goods. [Keep?](#)

To conclude our analysis, we test how politics influences our results (e.g., Lee, Moretti, and Butler, 2004). We find that the introduction of the income tax only increases government size under Democratic governors. Republican governors appear to offset any greater tax revenues from income taxation with smaller revenues from other tax and non-tax sources. [Yes?](#) Furthermore, we find that the introduction of the income tax only increases per capita spending on education under Democratic governors. Our results suggest that political ideology significantly influences the nature of policy responses to tax broadening.

Our paper presents new evidence about the fiscal mechanisms that form the basis of modern states. Standard economic theory takes the power to tax as given. However, historical accounts indicate that the development of the state's extractive capacity took centuries (Brewer, 1989, Dincecco, 2011, O'Brien, 2011). The results of our study shed new light on

an actual mechanism – the introduction of the income tax – through which governments increase fiscal capacity. In this respect, our paper relates to the literature that tests the causes (e.g., franchise extension) of fiscal policy reforms (Slemrod, 2005, Aidt et al., 2006, Dharmapala and Hines, 2009).

Our paper offers a unique laboratory in which to test the policy responses of fiscal change. The literature on long-run state development highlights the role of warfare (Tilly, 1992, Bates, 2009, Besley and Persson, 2009). Tilly (1992) argues that, to fend off external military threats, governments in history undertook fiscal reforms that enabled them to secure greater and more regular forms of taxation. Scheve and Stasavage (2010, 2012) find a positive and significant cross-country relationship between warfare and progressive taxation over the past two centuries. Aghion et al. (2012) link external military threats with government investments in primary education at the cross-country level. Our within-country analysis is less vulnerable than the cross-country approach to omitted variables that may bias our estimates. First, given a national system of military defense, the external threat environment is constant across US states. Second, state-level political institutions are very similar. Thus, our paper is in a novel position to disentangle the “pure” policy responses of fiscal reform from warfare and political institutions.²

Finally, our paper contributes to the literature on policy responses to changes in fiscal environments or institutions. Balassa (1986) and Tanzi (1986) study how fiscal policies in developing nations respond to unexpected events. Porterba (1994) shows how fiscal policies respond to fiscal imbalances among US states. Dusek (2006) finds that government revenues rise when US states introduce income withholding. Grembi, Nannicini, and Troiano (2014) show that local governments in Italy decrease revenues but leave expenditures unchanged when fiscal restraints are relaxed. Casaburi and Troiano (2015) show that the provision of public goods increases when local governments in Italy crack down on tax evasion. Our paper complements this literature by showing how public policies change in response to

²The literature on within-country variations in state capacity is small. Acemoglu et al. (2015) find that state capacity improvements have a significant effect on local economic outcomes in Colombia.

tax-broadening.³

The paper proceeds as follows. In Section 2, we discuss the data and general trends. In Section 3, we describe the empirical strategy. In Section 4, we present our results. In Section 5, we test the role of politics. Section 6 concludes. [Use the phrase “quasi-experimental” in the introduction?](#)

2 Data

2.1 Income Tax Introduction

Following Wallis (2000), we define the income tax to include individual or corporate income taxes. For more than 60 percent of adopting states, this distinction is immaterial, because individual and corporate income taxes were introduced in the same year. For the remaining states, we define our treatment as the year that the individual income tax was introduced. In the appendix, we show that our results are unchanged if we define our treatment as the year that the corporate income tax was introduced.⁴

Table ?? describes the introduction of the income tax by states over time according to Penniman (1980). The first state to introduce the individual income tax was Wisconsin in 1911. Seven more states introduced individual income tax laws over the 1910s, followed by five states over the 1920s, and eighteen states over the 1930s. No states introduced the individual income tax over the 1940s, while two states introduced it over the 1950s, eight states over the 1960s, and four states over the 1970s. Six states (Florida, Nevada, South Dakota, Texas, Washington, and Wyoming) never introduced an individual income tax.⁵

³There is a large literature that explores the relationship between franchise extension and tax and spending outcomes, both at the cross-country level (Lindert, 2004) and the within-country level (Husted and Kenny, 1997, Lott and Kenny, 1999, Aidt et al., 2010). We contribute to this literature by focusing on the broadening of the fiscal base rather than the voter base.

⁴Penniman (1980) defines two types of corporate income tax: the net income tax and the excise or franchise tax. We always date the corporate income tax that is introduced first, regardless of type.

⁵Two states (New Hampshire and Tennessee) have individual income taxes that only tax interest and dividends. The individual income tax in Connecticut was of this type between 1969-1990. We define these states as having individual income taxes. However, defining them as having no individual income tax and

Once states introduce the individual income tax, they typically retain it.⁶ There are only two cases where states have repealed or fundamentally changed the income tax. Alaska had an income tax when it became a state in 1959, but repealed it in 1980. Connecticut introduced a progressive income tax in 1991; from 1969 to 1990, the state only taxed interest and dividends.⁷

Figure 1 maps the introduction of the income tax across states. [Should we add this map? It will help flesh out our study.](#)

2.2 Fiscal Data

We collect all available census data on state-level revenues and expenditures over the twentieth century. The first census data are for 1902 (US Department of Commerce, 1907). The 1902 census was the first to attempt to collect complete fiscal information (Wallis, 2000). Prior to this census, the Bureau of the Census did not collect data on revenues (as opposed to taxes) or expenditures. Follow-up census data for state-level fiscal activity are available for 1903, 1913, 1922, 1931, and 1932 (US Department of Commerce, 1915, 1924, 1935).⁸ Census data are available online every two years from 1942 to 1950 and annually from 1950 onward (US Department of Commerce, 2015). The result is an unbalanced panel that covers all 50 states between 1902 and 2008.⁹ [To double-check.](#)

We focus on the main public finance outcomes in the census data, which we select according to two criteria. First, to investigate the *total* effect of our treatment on state finances, we use total revenues and expenditures. Second, we include outcomes that we can match across different censuses, which do not always follow the same accounting procedures. On

re-running our regression analysis does not change our results. [Yes?](#)

⁶Most state income taxes are progressive. Some states (e.g., Indiana, Michigan, Pennsylvania) use flat-rate income taxes. Occasionally, states adjust income tax rates.

⁷Once introduced, the corporate income tax is also generally stable. Only two states have repealed or fundamentally changed this tax. Michigan introduced a corporate income tax in 1967, but repealed it in 1975; this tax was re-introduced in 2011 (after our sample period ends). Similarly, Ohio introduced a corporate income tax in 1971, but repealed it in 2005.

⁸Expenditure data are not available for 1922.

⁹We exclude Washington DC from our analysis, even though census data are available, because it is not a state. However, including Washington DC and re-running our regression analysis does not change our results. [Yes?](#)

the revenue side, we focus on 1) income tax revenues, 2) property tax revenues (a “placebo”), 3) total tax revenues, and (4) total revenues. On the expenditure side, we focus on 1) total expenditures, 2) education expenditures, 3) health expenditures, and 4) public safety expenditures.

Table 2 displays the summary statistics for our variables. The public finance variables are in logarithms in real (1982-4) dollars per capita. [To double-check.](#)

2.3 Summary Trends

Figure 2 illustrates the relationship between the introduction of the income tax and per capita total revenues. We normalize all state years such that year 1 on the horizontal axis represents the first year that the income tax was introduced in a given state. Values to the right show the number of years after the introduction of the income tax, and values to the left show the number of years prior. Total revenues are stable in the years before the introduction of the income tax. However, once the income tax is introduced, total revenues immediately rise from X to Y percent over the next five years. This timing suggests that the introduction of the income tax by states is uncorrelated with past fiscal trends. We further discuss the potential challenge of fiscal pre-trends ahead. [Paragraph to proof. Figure to add. To make figure, we may need to interpolate. Or, we can show a scatter plot with before and after observations.](#)

Similarly, Figure 3 illustrates this relationship for total expenditures (solid line) and per capita education expenditures (dashed line). Total expenditures are stable in the years prior to the introduction of the income tax, but immediately rise thereafter. The same trend holds for education expenditures. Once more, this timing suggests that the income tax is uncorrelated with fiscal pre-trends. [Paragraph to proof. Figure to add.](#)

3 Empirical Strategy

To estimate the policy responses to the introduction of the income tax, we use a difference-in-differences identification strategy. We base this strategy on the staggered introduction of the income tax across states. Our rationale for identification is that the introduction of the income tax constitutes a plausibly exogenous shock – arguably related to political factors – to the breadth of the statutory tax base in a given state. Sentences okay? Keep political factors rationale? How relates to section 5?

Our baseline specification is thus:

$$Y_{it} = \beta_0 + \beta_1 Post_{is} + \phi_i + \phi_t + \epsilon_{ist}. \quad (1)$$

The dependent variables are public finance outcomes (revenues and expenditures) in state i and year t in real per-capita terms. All dependent variables are in logarithms. The dummy variable $Post$ is equal to one after the introduction of the income tax in year s , which differs across states. The state fixed effects ϕ_i control for state-specific differences in geographical features, innate “preferences” for government programs, and institutional structures. The year fixed effects ϕ_t control for time-varying changes in the relative prices of government services, national economic conditions, “tastes” for federal government programs, and other year-specific shocks. The standard errors ϵ_{ist} are robust to heteroskedasticity and are clustered at the state level. The coefficient of interest β_1 captures the causal effect of tax broadening on fiscal policies under plausible assumptions.

A potential challenge to our identification strategy is that the adoption of the income tax may be correlated with past fiscal trends. For example, a state may decide to introduce the income tax in the face of greater budgetary demands. If this is the case, then our identifying assumptions will be violated. Our setting enables us to verify just how relevant this concern is. If broadening the tax base is actually exogenous to past fiscal policy choices, then we would expect fiscal pre-trends in treated and control states to be parallel before the introduction of the income tax, and to diverge only after our treatment. We verify our identifying

assumptions ahead.

Finally, note that tax broadening does not necessarily imply that any change to status quo fiscal policies will result. For example, a state government can broaden the tax base but still leave total revenues unchanged (or even reduced) by decreasing other current tax rates.

4 Main Results

We present our results for state revenues and expenditures for two types of specifications. The first specification is equation 1, our baseline, which we present in Panel A of the following tables. To control for fiscal pre-trends, the second specification adds state-specific linear time trends to the baseline equation. Panel B of the following tables presents the results for this specification.

4.1 State Revenues

In Table 3, we consider the effect of broadening the tax base on state revenues. Column 1 reports the effect of tax broadening on income tax revenue. We can think of this specification as our “first stage”: in order to show that the introduction of the income tax increases government size, we must first show that it fact increases income tax revenue. There is a positive relationship between tax broadening and income taxation, significant at the 1 percent level.

As a “placebo”, column 2 reports the effect of the introduction of the income tax on revenues from property taxation. Reassuringly, there is no significant relationship between tax broadening and property taxation. This result reinforces the argument that the introduction of the income tax actually causes greater income taxation, as opposed to an omitted variable (e.g., a change in the public’s “taste” for government) that drives both fiscal reform and higher taxation. [Yes? Paragraph to keep? Note that I changed the column ordering.](#)

Column 3 reports the effect on total tax revenue. We find that the introduction of the income tax is associated with a 17 percent increase in total tax revenue. The coefficient on β_1 is highly significant. This result indicates that – at least on average – governments did not

offset broadening the tax base with reductions in other forms of taxation.

Column 4 reports one of our main results: broadening the tax base increases *total* state revenues by 14 percent. Relative to the previous results, this result indicates that the introduction of the income tax did not just revenue from income taxation or total taxation, but actually led to greater government size overall.

The similarities in magnitude and significance of the coefficients across Panels A and B suggest that pre-existing linear trends in state budgets do not drive our results. However, it is still possible that non-linear trends are relevant. To rule out this concern, Figure 1 plots the pre-trends. There is nothing irregular about the pre-trends. As expected, we see clear trend breaks for the revenue variables (income tax, total tax, total revenues) after the introduction of the income tax. [Yes?](#) This figure provides further support for our identifying assumptions.

[Note appendix table in this section?](#)

4.2 State Expenditures

Table 4 considers the corresponding effect of broadening the tax base on state expenditures. Column 1 reports the effect of tax broadening on total state spending. There is a significant relationship between the introduction of the income tax and government spending, which increases total state expenditures by 13 percent. Reassuringly, the magnitude of this coefficient corresponds well with the estimate for total revenues (column 4 of Table 3). [Note that I changed the column ordering.](#)

Columns 2-4 break down this increase by spending categories. The introduction of the income tax has the largest effect for education spending (column 2): broadening the tax base is associated with a 24 percent increase in education expenditures. This effect is highly significant. This result suggests that tax broadening led to the greater provision of productivity-enhancing public goods (Barro, 1990, Goldin and Katz, 2008). Column 3 reports the effect of the introduction of the income tax on health spending. This effect is also large, though not as big as the effect for education. Tax broadening is associated with a 13 percent increase in health expenditures, significant at the 10 percent level. Column 4 reports the results for

public safety expenditures. Unlike for education or health spending, the introduction of the income tax has no significant effect on spending on this type of public good.

Finally, the similarities in magnitude and significance of the coefficients in Panels A and B, along with the pre-trends plotted in Figure 2, provide support for our identifying assumptions for this part of our analysis.

4.3 Placebo Tests

Does it make sense to add placebo tests, where we recode the introduction of the income tax as if it had taken place years prior to the actual years? They can help flesh out our study.

5 The Politics of Tax Broadening

Party affiliation matters for the types of public policies that are implemented (e.g., Lee, Moretti, and Butler, 2004). Motivated by this evidence, we ask how politics affects our main results. To proxy for the political leanings of states, we use the governor's party affiliation.

Figure X illustrates the summary trends for state revenues by party affiliation. Though trends in total revenues look similar under Democrats and Republicans prior to the introduction of the income tax, they diverge thereafter: total revenues rise under Democrats but do not under Republicans. The trends for total expenditures and education expenditures in Figures Y and Z are similar: both variables only rise after the introduction of the income tax under Democrats, but not under Republicans. This evidence is consistent with the argument that political ideology matters for public policy responses to broadening the tax base. Paragraph to proof. Figures to add. I think that it could be nice to add such figures to help flesh out our study.

To explicitly test whether Democratic or Republican states respond differently to broadening the tax base, we estimate the following equation:

$$Y_{it} = \beta_0 + \beta_1 Post_{it} + \beta_2 Post_{it} * Politics_i + \phi_i + \phi_t + \epsilon_{ist}, \quad (2)$$

where $Politics_i$ is the political leaning of state i at the time of the introduction of the income tax. The other variables are defined as in equation 1.

Table 5 presents the results of this analysis for state revenues. The introduction of the income tax increases total tax revenues in all states (column 1), but only increases total state revenues in Democratic states (column 2). This result suggests that whether tax broadening leads to larger government depends on the political ideology and policy goals of the government in office. Republican states appear to offset any potential increase in revenue from income taxation with a reduction in revenues from other tax and non-tax sources. Given that the political ideology of states at the time of the introduction of the income tax is not randomly assigned, we are careful not to interpret these estimates as causal. Still, it is reassuring that these estimates are robust to fixed effects for states and years. [Note that I changed the column ordering. Why not also show Panel B with pre-trends?](#)

Table 6 presents the corresponding results for state expenditures. Consistent with the previous set of findings, total expenditures (column 1) and education expenditures (column 2) only increase after the introduction of the income tax in Democratic states. Furthermore, once we distinguish between states by political leanings, we find that Democratic states significantly increase spending on public safety, but that Republican states significantly reduce it (column 4). [Note that I changed the column ordering.](#)

6 Conclusion

The state's capacity to extract revenues and provide public goods matters for economic development (Besley and Persson, 2013). In this paper, we present new evidence about an actual mechanism – broadening the tax base – through which modern states became strong. We test the policy consequences of a major institutional reform in recent fiscal history: the twentieth-century introduction of the income tax by US states. Our difference-in-differences identification strategy exploits the staggered introduction of the income tax across states. Thus, we can identify the causal effects of tax broadening on state revenue and expenditure

outcomes.

Our main results are two-fold. First, we find that the introduction of the income tax is associated with a significant increase in total revenues. Second, we find that this institutional reform is associated with significantly greater spending on public goods in education and health. Our results are robust to unobserved heterogeneity across states and over time. Furthermore, we show that fiscal pre-trends do not drive our results.

Politics appears to influence the fiscal consequences of tax broadening. We find that the introduction of the income tax only leads to greater fiscal capacity and higher spending on public goods in Democratic states. These results suggest that there is an important link between political ideology and the nature of policy responses to tax broadening. We view this paper as a first step toward establishing this relationship.

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Table 1: Introduction of State-Level Income Tax

State	Individual	Corporate
Wisconsin	1911	1911
Mississippi	1912	1921
Oklahoma	1915	1931
Massachusetts	1916	1919
Delaware	1917	1957
Missouri	1917	1917
New York	1919	1917
North Dakota	1919	1919
North Carolina	1921	1921
South Carolina	1922	1922
New Hampshire	1923	1970
Arkansas	1929	1929
Georgia	1929	1929
Oregon	1930	1929
Idaho	1931	1931
Tennessee	1931	1923
Utah	1931	1931
Vermont	1931	1931
Alabama	1933	1933
Arizona	1933	1933
Kansas	1933	1933
Minnesota	1933	1933
Montana	1933	1917
New Mexico	1933	1933
Iowa	1934	1934
Louisiana	1934	1934
California	1935	1929
Kentucky	1936	1936
Colorado	1937	1937
Maryland	1937	1937
Washington DC	1939	1939
Alaska	1959-80	1959
Hawaii	1959	1959
Virginia	1961	1915
West Virginia	1961	1967
Indiana	1963	1963
Michigan	1967	1967-75
Nebraska	1967	1967
Connecticut	1969	1915
Illinois	1969	1969
Maine	1969	1969
Ohio	1971	1971-2005
Pennsylvania	1971	1935
Rhode Island	1971	1947
New Jersey	1976	1958
Florida	None	1971
Nevada	None	None
South Dakota	None	None
Texas	None	None
Washington	None	None
Wyoming	None	None

Source: Penniman (1980). [Align table at top of page.](#)

Table 2: Summary Statistics

Notes: All nominal-level variables in millions of dollars. All public finance variables in logarithms in real (1982-4) dollars per capita. [Clean up labels.](#)

Table 3: Effects of Introduction of Individual Income Tax on State Revenues

Panel A: State-Specific Linear Time Trends Excluded

Panel B: State-Specific Linear Time Trends Included

Notes: Estimation method is OLS. Post-Income Tax is indicator variable that takes value of 1 after state introduces individual income tax. Heteroskedasticity-robust standard errors clustered at state level (in parentheses). Sample covers years 1902-2008. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Effects of Introduction of Individual Income Tax on State Expenditures

Panel A: State-Specific Linear Time Trends Excluded

Panel B: State-Specific Linear Time Trends Included

Notes: Estimation method is OLS. Post-Income Tax is indicator variable that takes value of 1 after state introduces individual income tax. Heteroskedasticity-robust standard errors clustered at state level (in parentheses). Sample covers years 1902-2008. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Heterogeneous Effects of Introduction of Individual Income Tax on State Revenues – Politics

Notes: Estimation method is OLS. Post-Income Tax is indicator variable that takes value of 1 after state introduces individual income tax. Politics variable takes value of 1 if Democratic governor was in office at time of introduction of income tax and takes value of 0 otherwise. Heteroskedasticity-robust standard errors clustered at state level (in parentheses). Sample covers years 1902-2008. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Heterogeneous Effects of Introduction of Individual Income Tax on State Expenditures – Politics

Notes: Estimation method is OLS. Post-Income Tax is indicator variable that takes value of 1 after state introduces individual income tax. Politics variable takes value of 1 if Democratic governor was in office at time of introduction of income tax and takes value of 0 otherwise. Heteroskedasticity-robust standard errors clustered at state level (in parentheses). Sample covers years 1902-2008. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: State Revenue Point Estimate Pre-trends

Figure 2: State Expenditure Point Estimate Pre-trends

Effects of Introduction of Income Tax (Corporate or Individual) on State Revenues [Appendix Table](#)

Panel A: State-specific Linear Time Trends Excluded

Panel B: State-specific Linear Time Trends Included

Notes: Estimation method is OLS. Post-Income Tax is indicator variable that takes value of 1 after state introduces either a corporate or individual income tax. Heteroskedasticity-robust standard errors clustered at state level (in parentheses). Sample covers years 1902-2008. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Effects of Introduction of Income Tax (Corporate or Individual) on State Expenditures [Appendix Table](#)

Panel A: State-specific Linear Time Trends Excluded

Panel B: State-specific Linear Time Trends Included

Notes: Estimation method is OLS. Post-Income Tax is indicator variable that takes value of 1 after state introduces either a corporate or individual income tax. Heteroskedasticity-robust standard errors clustered at state level (in parentheses). Sample covers years 1902-2008. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$