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State investment tax incentives: A zero-sum game?☆

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ABSTRACT

Over the past four decades, state investment tax incentives have proliferated. This emergence of state investment tax credits (ITC) and other investment tax incentives raises two important questions: 1) Are these tax incentives effective in achieving their stated objective, to increase investment within the state?; 2) To the extent these incentives raise investment within the state, how much of this increase is due to investment drawn away from other states?

To begin to answer these questions, we construct a detailed panel dataset for 48 states for 20+ years. The dataset contains series on output and capital, their relative prices, and establishment counts. The effects of tax variables on capital formation and establishments are measured by the Jorgensonian user cost of capital that depends in a nonlinear manner on federal and state tax variables. Cross-jurisdictional differences in state investment tax credits and state corporate tax rates entering the user cost, combined with a panel that is long in the time dimension, are key to identifying the effectiveness of state investment incentives.

Two models are estimated. The Capital Demand Model is motivated by the first-order condition for a profit-maximizing firm and relates at the state level the capital/output ratio to the relative user cost of capital. The Twin-Counties Model exploits both the spatial breaks ("discontinuities") in tax policy at state borders and our panel dataset to relate at the county level the relative user cost to the location of manufacturing establishments. Using the Capital Demand Model, we find that own-state capital formation is substantially increased by tax-induced reductions in the own-state price of capital and, more interestingly, substantially decreased by tax-induced reductions in the price of capital in competitive-states. Similarly, using our Twin-Counties Model, we find that county manufacturing establishment counts around state borders are higher on the side of the border with the lower price of capital, but the difference is economically small, suggesting that establishments are much less mobile than overall capital. Extensions of the Capital Demand Model also reveal that state capital tax policy appears to be a zero-sum game among the states in that an equiproportionate increase in own-state and competitive-states user costs tends to have no effect on own-state capital formation.

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1. Introduction

Over the past four decades, state investment tax incentives have proliferated (Chirinko and Wilson, 2007a). For instance, though the U.S. federal investment tax credit (ITC) was permanently repealed in 1986, ITCs at the state level have grown dramatically. As shown in Fig. 1, 40% of states now offer a general, state-wide tax credit on investment in machinery and buildings, and the average rate of this credit exceeds 6 percentage points in 2004. The abundance of this and other state investment tax incentives raises important empirical questions — are these tax incentives effective in increasing investment and other forms of economic activity within the state? Academic research is far from a consensus on this point. Fisher and Peters, 1998, pp. 12–13) state that "[I]n the case of the first argument [economic development incentives probably can influence firm location and expansion decisions…], the literature is massive but still inconclusive; …" In his survey paper, Wasylenko (1997, p. 38) concludes that elasticities of various forms of economic activity to tax policy "are not very reliable and change depending on which variables are included in the estimation equation or which time period is analyzed." By contrast, an overview of papers (including Wasylenko's study) presented at a conference focusing on the effectiveness of state and local taxes reports that there was general agreement that state and local policies affect economic activity within their borders, though the effects "are generally modest" (Bradbury, Kodrzycki, and Tannenwald, 1997, p. 1). A similar conclusion is reached in the encyclopedia entry by Bogart and Anderson (2005) concerning the effects of state policies on firm location. Perhaps the title of the report by McGuire (2003) best summarizes the current state of the scholarly empirical literature — "Do Taxes Matter? Yes, No, Maybe So."

To the extent tax incentives are effective in raising investment within a state or attracting businesses to a state, a second question arises from a national perspective — how much of this increase is due to investment being drawn away from other states? As noted by Stark and Wilson (2006), surprisingly few empirical studies have addressed this question. Understanding the source of the increase in capital formation and establishment count is important for assessing whether the increase merely reflects a zero-sum game among states and for informing discussions about the constitutionality of certain state tax incentives in light of the U.S. Constitution's Commerce Clause.[1]

These two questions are addressed in this paper with a comprehensive new panel dataset that we constructed covering the 48 contiguous states for 20+ years (depending on the series). This dataset allows us to define variables tied tightly to theory and to utilize a variety of powerful econometric techniques. Panel data have the decided advantages of allowing us to control for factors such as land and infrastructure that are fixed or change slowly over time and for aggregate effects such as the business cycle. The relative scarcity of empirical research on interstate capital mobility and tax competition may be traceable in good part to the absence of comprehensive data. Section 2 describes the panel dataset that is drawn from a several sources, including the Annual Survey of Manufacturers, national data from the Bureau of Economic Analysis, and a variety of sources of information on state tax variables. Details concerning construction and sources are provided in the Data Appendix.

We then develop and estimate a series of models to understand the responses of capital stock and establishment count data to tax incentives embedded in the user cost of capital. Section 3 contains a Capital Demand Model motivated by a standard first-order condition relating the capital stock to output and the user cost of capital. We specify the latter as the ratio of a state's own user cost of capital relative to the user cost of capital for a competitive set of states. The user cost of capital is based on the Hall–Jorgenson concept that relies on the equivalence between renting and owning a durable asset. Based on this insight, durable capital can be assigned a rental price that easily incorporates a variety of tax variables and can be analyzed with the traditional tools of price theory. The tax variables affecting this rental price qua user cost are the investment tax credit rates (state and federal), the corporate income tax rates (state and federal), and the state property tax rate. We find that a state's capital formation (conditional on its output) decreases with the user cost prevailing in the state but increases with the user cost available in competitive states, thus documenting the importance of interstate capital flows, a necessary element for meaningful tax competition. State investment incentives appear to be a zero-sum game among the states in that an equiproportionate increase in own-state and competitive-states user costs tends to have no effect on own-state capital formation.

Section 4 develops and estimates the Twin-Counties Model explaining the location of manufacturing establishments at the county level. This model exploits both the spatial breaks, or "discontinuities," that occur at state borders (and the resulting "natural experiment" afforded by pairs of counties in the same geographic area but separated by a state border) and the panel structure of our data to assess the effects of tax policy as reflected in the user cost. Comparing the differential outcomes of county pairs with similar nonpolicy conditions but differing state policies is akin to the twin studies employed frequently in labor economics and medical research. The Twin-Counties Model uncovers a statistically significant, though economically small, effect of user costs prevailing at the state level on the location of establishments at the county level. Moreover, this small effect vanishes as the distance between paired-counties increases. These findings suggest that manufacturing establishments are much less geographically mobile than overall capital.

Section 5 summarizes and concludes.

2. The panel dataset

The data constructed for and used in this paper measure economic activity in the manufacturing sector for the 48 contiguous states. This data set may be thought of as a state-level and county-level analog to other widely used data sets, such as the industry-level NBER

[1] Regarding the Commerce Clause, see the papers in the special section of the *Georgetown Journal of Law & Public Policy* (2006) and the session on "Are State Business Tax Incentive Good Public Policy?" in the *Proceedings of the 99th Annual Conference on Taxation* (National Tax Association, 2007).