

W.E. UPJOHN
INSTITUTE
FOR EMPLOYMENT RESEARCH

Dissertation Awards

1-1-2014

Labs of Democracy: Using Regional Variation to Understand Fiscal Policy Issues: Dissertation Summary

Owen Zidar
University of California, Berkeley

Follow this and additional works at: https://research.upjohn.org/dissertation_awards

Labs of Democracy: Using Regional Variation to Understand Fiscal Policy Issues

Owen Zidar

This dissertation uses a regional approach to assess the aggregate effects of cutting taxes on corporations and on taxpayers in different income groups. Determining the optimal course for economic policy critically depends on the efficiency and equity consequences of these policies.

The first chapter estimates the incidence of state corporate taxes on workers, landowners, and firm owners in a spatial equilibrium model in which corporate taxes affect the location choices of both firms and workers. Heterogeneous, location-specific productivities and preferences determine the mobility of firms and workers, respectively. Owners of monopolistically competitive firms receive economic profits and may bear the incidence of corporate taxes, as heterogeneous productivity can make them inframarginal in their location choices. We derive a simple expression for equilibrium incidence as a function of a few estimable parameters. Using variation in state corporate tax rates and apportionment rules, we estimate the reduced-form effects of tax changes on firm and worker location decisions, wages, and rental costs. We then use minimum distance methods to recover the parameters that determine equilibrium incidence as a function of these reduced-form effects. In contrast to previous assumptions of infinitely mobile firms and perfectly immobile workers, we find that firms are only approximately twice as mobile as workers over a 10-year period. This fact, along with equilibrium impacts on the housing market, implies that firm owners bear roughly 40 percent of the incidence, while workers and land owners bear 35 percent and 25 percent, respectively. Finally, we derive revenue-maximizing state corporate tax rates and discuss interactions with other local taxes and apportionment formulae.

The second chapter investigates how tax changes for different income groups affect macroeconomic activity. Using historical tax returns from the National Bureau of Economic Research's TAXSIM, I construct a measure of who received (or paid for) Romer and Romer (2012) exogenous tax changes. I aggregate these tax changes by income group and state. Variation in the income distribution across U.S. states and federal tax changes generates variation in regional tax shocks that I exploit to test for heterogeneous effects. I find that the negative relationship between tax changes and growth is largely driven by tax changes for lower-income groups, and that the effect of tax cuts for the top 10 percent on employment growth is small.

The dissertation evaluates the following questions: What are the aggregate effects on economic activity of cutting

taxes on corporations, and what are the aggregate effects on taxpayers in different income groups? A fundamental problem in answering these questions, however, is a dearth of data. Some economists have looked to the past to help understand the effects of these policies, but extrapolating from infrequent tax changes is difficult since there simply are not that many data points from U.S. macroeconomic history. As such, many resort to cross country analysis and highly structured models, but both approaches have significant limitations; countries are different in many unobservable ways and structured models often produce answers that ultimately reflect assumptions rather than the data itself.

Recognizing these limitations, economists have increasingly been using regions within the United States as labs of democracy to determine the effects of fiscal policies. Looking at the economic performance of states or cities is not only interesting and important in its own right, but it also provides much more data and enables economists to focus on places that got different doses of economic medicine and to learn about the medicine's effects. This regional analysis about different types of economic medicine, whether it is lower corporate taxes, reduced government spending, or upper-income tax cuts, can help sort through competing theories and provide valuable insight for policymakers who are considering different policy prescriptions.

In what follows, I introduce the two parts of my dissertation. The first evaluates the welfare effects of cutting corporate income taxes on business owners, workers, and landowners; the second analyzes the effects of tax cuts for different income groups on output and employment growth.

Chapter 1

Who Benefits from State Corporate Tax Cuts? A Local Labor Markets Approach with Heterogeneous Firms (with Juan Carlos Suárez Serrato)

Policymakers often use local economic development policies, such as corporate tax policy, to encourage businesses to locate in their jurisdictions (Story 2012). For instance, the governors of Kansas, Nebraska, and Louisiana have recently advocated for large state corporate income tax cuts Stevenson (2013). This chapter evaluates the welfare effects of cutting corporate income taxes on business owners, workers, and landowners. We make three contributions: 1) new empirical evidence of the effects of tax cuts on business location, 2) a new framework for evaluating the welfare effects of corporate tax cuts, and 3) a new assessment of corporate tax incidence and efficiency that is useful for policymakers.

In the standard open economy model of corporate tax incidence, immobile workers bear the full incidence of corporate taxes as capital flees high-tax locations (Kotlikoff

and Summers 1987; Gordon and Hines 2002). As a result, the conventional wisdom among economists and policymakers is that corporate taxation in an open economy is unattractive on both efficiency and equity grounds; it distorts the location and scale of economic activity and falls on the shoulders of workers. The standard model, however, neither incorporates the location decisions of firms, which increasingly drive policymakers' decisions on corporate tax policy, nor the possibility that a firm's productivity can differ across locations.

This chapter enhances the standard model by allowing the location decisions of monopolistically competitive and heterogeneously productive firms to determine the level and spatial distribution of capital, employment, and production. Accounting for these realistic features has substantial implications for the incidence and efficiency of corporate taxation. If a firm is especially productive in a given location, it can be inframarginal in its location choice. That is, tax and factor price increases may not offset productivity advantages enough to make relocation profitable. For example, if California were to increase corporate tax rates modestly, both new and existing technology firms may still find Silicon Valley the most profitable place in the world for them to locate. Thus, if firms' productivities are heterogeneous across locations, the location decisions of firms will be less responsive to corporate tax changes, and firm owners will bear some of the burden of corporate taxes. Furthermore, this lower responsiveness decreases the efficiency cost of raising revenue through corporate income taxation. Assessing the equity and efficiency of state corporate income taxes requires quantifying the extent to which location-specific productivity limits firm mobility.

Our analysis proceeds in three steps. We first present reduced-form evidence on the effects of taxes on business location. We then develop a model of spatial equilibrium with firm location to interpret these effects and characterize the welfare impacts on business owners, workers, and landowners. Finally, we estimate the parameters that govern this model and quantify these welfare effects. The variation in our empirical analysis comes from changes to state corporate tax rates and apportionment rules, which are state-specific rules that govern how national profits of multistate firms are allocated for tax purposes. We implement these state corporate tax system rules using matched firm-establishment data and construct a measure of the average tax rate that businesses pay in a local area. This approach not only closely approximates actual taxes paid by businesses, but it also provides multiple sources of identifying variation from changes in state tax rates, apportionment formulae, and the rate and rule changes of other states.

We begin our empirical analysis by quantifying the responsiveness of establishments to local business tax changes and document the validity of this variation through a number of robustness checks. If every establishment compares the profits that they would earn across locations (based

on local taxes, local factor prices, and their local productivity), then counting the number of establishments in a given area (and measuring how these counts change following tax changes) will reveal information about the relative importance of taxes, factor prices, and productivities for business location. We find that a 1 percent cut in local business taxes increases the number of local establishments by 3–4 percent over a 10-year period. This estimate is unrelated to other changes in policy that would otherwise bias our results, including changes in per-capita government spending and changes in the corporate tax base such as investment tax credits. To rule out the possibility that business tax changes occur in response to abnormal economic conditions, we analyze the typical dynamics of establishment growth in the years before and after business tax cuts. We also directly control for a common measure of changes in local labor demand from Bartik (1991). Finally, we estimate the effects of external tax changes of other locations on local establishment growth and find symmetric effects of business tax changes on establishment growth. These symmetric effects corroborate the robustness of our reduced-form result of business tax changes on establishment growth.

To interpret this reduced-form effect and determine its welfare implications, we develop a local labor markets model with heterogeneously productive and monopolistically competitive firms. Our model expands recent frameworks in the local labor markets literature (e.g., Kline and Moretti 2013) by incorporating modeling features popular in trade models. Adding these features enables us to model firms' location and scale decisions, to incorporate the possibility that individual firms have location-specific productivities, and to derive a simple expression that relates these features to local labor demand. Developing the demand side of local labor markets is important because our framework allows firm owners to bear some of the incidence of local economic development policies and can be used to assess the incidence implications of productivity shocks, as well as many other place-based policies.

Our framework models how business owners, workers, and landowners benefit from a local corporate tax cut. The incidence on these three groups depends on the equilibrium impacts on profits, real wages, and housing costs, respectively. A corporate tax cut affects labor, housing, and product markets, as well as the location and scale of economic activity. A tax cut mechanically reduces the tax liability and the cost of capital of local establishments, attracts establishments, and increases local labor demand. This increase in labor demand leads firms to offer higher wages, encourages migration of workers, and increases the cost of housing. Our model characterizes the new spatial equilibrium following a business tax cut and relates the changes in wages, rents, and profits to features of the labor, housing, and product markets. We show that the incidence on wages depends on the degree to which establishment location decisions respond to tax changes, an effective labor supply elasticity that depends

on housing market conditions, and a macro labor demand elasticity that depends on location and scale decisions of establishments. Having determined the incidence on wages, the incidence on profits is straightforward; it combines the mechanical effects of lower corporate taxes and the impact of higher wages on production costs. Our model delivers simple expressions for the incidence calculations in terms of a few estimable parameters.

In the third part of the analysis, we estimate these parameters, test overidentifying restrictions of the model, and find that they are satisfied. In particular, we minimize the distance between the predicted equilibrium effects of business tax cuts from our model and the estimated reduced-form effects of tax cuts on local establishment growth, as well as similar effects on population, wage, and rental cost growth. The structural parameters are precisely estimated.

Our main finding is that, over a 10-year period, firm owners bear a substantial portion of the incidence of a corporate tax change, while land owners and workers split the remaining burden. Our estimates place approximately 40 percent of the burden on firm owners, 25 percent on landowners, and 35 percent on workers; the finding that firms bear a substantial portion of the burden is robust across a variety of specifications and estimating assumptions. The result that firm owners may bear the incidence of local policies starkly contrasts with existing results in the corporate tax literature (e.g., Fullerton and Metcalf 2002) and is a novel result in the local labor markets literature (e.g., Moretti 2011).

In the last section of the chapter, we analyze the efficiency costs of state corporate income taxes and discuss the implications of our results for the revenue-maximizing tax rate. While business location decisions are not particularly sensitive to tax changes, there are important tax interactions with other revenue sources and apportionment tax rules that affect revenue-maximizing tax rates. Business mobility is an oft-cited justification in proposals to lower states' corporate tax rates. However, we find that business location distortions per se do not lead to a low revenue-maximizing rate. Based solely on the responsiveness of establishment location to tax changes, corporate tax revenue-maximizing rates would be nearly 40 percent. This rate greatly exceeds average state corporate tax rates, which were 7 percent on average in 2010. We explore how interactions with other sources of state tax revenue and apportionment tax rules affect this conclusion. We find that corporate tax cuts have large fiscal externalities by distorting the location of individuals. This additional consideration implies substantially lower revenue-maximizing state corporate tax rates than the 40 percent rate based only on establishment mobility. Nonetheless, the revenue-maximizing tax rate also depends on state apportionment rules. We find that states can increase corporate tax rates if these increases are accompanied by other changes to states' tax rules. In particular, by apportioning on the basis of sales activity, policymakers can decrease the importance of firms'

location decisions in the determination of their tax liabilities and thus lower the distortionary effects of corporate taxes.

Chapter 2

Tax Cuts For Whom? Heterogeneous Effects of Income Tax Changes on Growth and Employment

Changes to income tax policy in the United States have varied substantially in the postwar period. In the early 1980s and 2000s, the largest tax cuts as a share of income went to top-income taxpayers. In the early 1990s, top-income earners faced tax increases, while taxpayers with low to moderate incomes received tax cuts. This chapter investigates how the composition of these tax changes affects subsequent macroeconomic activity. Do tax cuts that go to high-income taxpayers generate more output and employment growth than similarly sized tax cuts for low- and moderate-income taxpayers?

Answering this question requires overcoming three empirical difficulties: endogeneity, simultaneity, and observability. First, many tax changes happen in response to current or expected economic conditions. Second, tax changes for low- and high-income taxpayers often occur at the same time. Third, the number of data points and tax changes in the postwar period is somewhat limited.

I use two identification approaches to overcome these empirical difficulties: narrative and compositional. For the narrative approach, I examine the effects of tax changes that are not related to the current state of the economy according to the classification approach of Romer and Romer (2010). They use the historical record (such as congressional records, economic reports, and presidential speeches) to identify tax changes that were taken for more exogenous reasons, such as pursuing long-run growth or deficit reduction. Doing so enables me to overcome the first empirical difficulty. I supplement the narrative strategy with an approach that exploits compositional differences in income groups across states. This compositional approach is based on the logic of Bartik instruments, which are commonly used in the labor literature (Bartik 1991; Katz and Murphy 1992; Moretti 2004). Bartik's idea is that a given national shock can have different impacts at the local level. For instance, a national demand shock to the auto industry will impact Detroit more than Denver, since employment in the auto industry comprises a larger share of local employment in Detroit. Applying this idea to the question of this chapter, observe that when national tax policy affects top-income taxpayers, states with a larger share of top-income taxpayers face bigger aggregate tax changes. Connecticut, whose share of top-income taxpayers is nearly twice as big as the typical state, is analogous to Detroit in the auto industry example. In short, my compositional approach compares growth in employment and out-

put across states that face tax shocks of different sizes. Since these state tax shocks occur in the same year for the same national policy change, they provide additional identifying variation and help address simultaneity and observability issues.

I primarily use individual tax return data to implement these two identification approaches. For each tax change that classifies as exogenous, I construct a measure of who received (or paid for) the tax change. The measure of the tax change is based on three things: 1) income and deductions in the year prior to an exogenous tax change, 2) the old tax schedule, and 3) the new tax schedule. For example, consider a taxpayer in 1992 whose income was \$180,000. Based on her 1992 income and deductions, she would have paid \$50,500 in taxes according to the old 1992 tax rate schedule and \$54,000 according to the new 1993 tax rate schedule. My measure assigns her a \$3,500 tax increase for 1993. I use the prior year tax data to avoid conflating behavioral responses and measured changes in tax liabilities. After calculating mechanical tax changes for each individual taxpayer, I then aggregate these tax changes for each taxpayer in the bottom 90 percent and top 10 percent of AGI, respectively.

For the narrative approach, I relate tax changes for the bottom 90 percent and the top 10 percent to national output, employment, consumption, and investment growth. For the compositional approach, I look at similar relationships at the state level. In particular, I relate state employment growth to tax shocks for the bottom 90 percent and the top 10 percent, respectively. Looking at the impact of state tax shocks is motivated by the following testable insight. If tax cuts for high-income earners generate substantial economic activity, then states with a large share of high-income taxpayers should grow faster following a tax cut for high-income earners.

I find that the stimulative effect of tax cuts largely results from tax cuts for the bottom 90 percent. A 1 percent of GDP tax cut for the bottom 90 percent results in roughly 3 percentage points of GDP growth over a two-year period. The corresponding estimate for the top 10 percent is -0.5 percentage points and is statistically insignificant. Aggregate consumption growth is stronger following tax changes for the bottom 90 percent. Consistent with results from individual survey data about how people spend tax rebates (Parker et al. 2013), durable consumption growth is especially strong following tax changes for the bottom 90 percent. These consumption results suggest that tax cuts for the bottom 90 percent stimulate economic activity and result in employment growth. The consumption channel can help explain why there is little detectable relationship between tax cuts for the top 10 percent and employment growth in the short run. Investment also increases following tax cuts for the bottom 90 percent, echoing a classic paradox of thrift result (i.e., a reduction in individual saving can lead to larger aggregate

savings by increasing economic growth). The state-level results, which are based on a different source of identifying variation, are consistent with these national results. States with a higher share of high-income taxpayers do not grow materially faster following high-income tax cuts, while more low- and moderate-income taxpayers grow much faster following their respective tax cuts. I also estimate the effects of tax changes across the income distribution to show that these findings are robust to different income groupings besides the bottom 90 and top 10, and that the largest impacts come from the lower-income groups. Overall, my results suggest that there are substantial effects from fiscal policy, and that heterogeneity is quite important.

References

- Altig, David, Alan J. Auerbach, Laurence J. Kotlikoff, Kent A. Smetters, and Jan Walliser. 2001. "Simulating Fundamental Tax Reform in the United States." *American Economic Review* 91(3): 574–595.
- Auerbach, Alan J. 2006. "Who Bears the Corporate Tax? A Review of What We Know." In *Tax Policy and the Economy*. Vol. 20. James Poterba, ed. Cambridge, MA: MIT Press, pp. 1–40.
- . 2010. *A Modern Corporate Tax*. Technical report. Washington, DC: Center for American Progress and The Hamilton Project.
- Bartik, Timothy J. 1985. "Business Location Decisions in the United States: Estimates of the Effects of Unionization, Taxes, and Other Characteristics of States." *Journal of Business & Economic Statistics* 3(1): 14–22.
- . 1991. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.
- Cullen, Zoe, Juan Carlos Suárez Serrato, and Owen Zidar. 2013. "State Corporate Taxes, Firm Mobility, and Innovation Productivity: Evidence from US Patent Data." Working paper. Stanford and Berkeley, CA: Stanford University and University of California.
- Desai, Mihir A., C. Fritz Foley, and Jamres R. Hines Jr. 2007. "Labor and Capital Shares of the Corporate Tax Burden: International Evidence." Working paper. Cambridge, MA: Harvard University.
- Duranton, Gilles, Laurent Gobillon, and Henry G. Overman. 2011. "Assessing the Effects of Local Taxation Using Microgeographic Data." *Economic Journal* 121(555): 1017–1046.
- Feldstein, Martin, and Marian Vaillant. 1998. "Can State Taxes Redistribute Income?" *Journal of Public Economics* 68(3): 369–396.
- Fuest, Clemens, Andreas Peichl, and Sebastian Siegloch. 2013. "Do Higher Corporate Taxes Reduce Wages? Micro Evidence from Germany." Discussion paper. Bonn: Institute for the Study of Labor.

- Fullerton, Don, and Gilbert E. Metcalf. 2002. "Tax Incidence." In *Handbook of Public Economics*. Vol. 4. Alan J. Auerbach and Martin Feldstein, eds. Amsterdam: Elsevier, pp. 1787–1872.
- Goolsbee, Austan, and Edward L. Maydew. 2000. "Coveting thy Neighbor's Manufacturing: The Dilemma of State Income Apportionment." *Journal of Public Economics* 75(1): 125–143.
- Gordon, Roger H., and James R. Hines. 2002. "International Taxation." In *Handbook of Public Economics*. Vol. 4. Alan J. Auerbach and Martin Feldstein, eds. Amsterdam: Elsevier, 1935–1995.
- Gravelle, Jane, and Kent Smetters. 2006. "Does the Open Economy Assumption Really Mean That Labor Bears the Burden of a Capital Income Tax?" *B.E. Journal of Economic Analysis & Policy* 6(1): 1–44.
- Gyourko, Joseph, and Joseph Tracy. 1989. "The Importance of Local Fiscal Conditions in Analyzing Local Labor Markets." *Journal of Political Economy* 97(5): 1208–1231.
- Hall, Robert E., and Charles I. Jones. 1999. "Why Do Some Countries Produce So Much More Output Per Worker than Others?" *Quarterly Journal of Economics* 114(1): 83–116.
- Holmes, Thomas J. 1998. "The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders." *Journal of Political Economy* 106(4): 667–705.
- Katz, Lawrence F., and Kevin M. Murphy. 1992. "Changes in Relative Wages, 1963–1987: Supply and Demand Factors." *Quarterly Journal of Economics* 107(1): 35–78.
- Kline, Patrick, and Enrico Moretti. 2013. "People, Places, and Public Policy: Some Simple Welfare Economics of Local Economic Development Programs." Working paper. Berkeley: University of California.
- Kotlikoff, Laurence J., and Lawrence H. Summers. 1987. "Tax Incidence." In *Handbook for Public Economics*. Vol. 2, Alan J. Auerbach and Martin Feldstein, eds. Amsterdam: Elsevier, pp. 1043–1092.
- Levchenko, Andrei A., and Jing Zhang. 2012. "Ricardian Productivity Differences and the Gains from Trade." Working Paper No. 633. Research Seminar in International Economics. Ann Arbor, MI: University of Michigan.
- McLure Jr., Charles E. 1977. "State Corporate Income Tax: Lambs in Wolves' Clothing?" OTA Paper 25. Washington, DC: Office of Tax Analysis.
- Moretti, Enrico. 2004. "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data." *Journal of Econometrics* 121: 175–212.
- . 2011. "Local Labor Markets." In *Handbook of Labor Economics*. Vol. 4. Orley Ashenfelter and David Card, eds. Amsterdam: Elsevier, pp. 1237–1313.
- Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McClelland. 2013. "Consumer Spending and the Economic Stimulus Payments of 2008." *American Economic Review* 103(6): 2530–2553.
- Romer, Christina, and David Romer. 2010. "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks." *American Economic Review* 100(3): 763–801.
- . 2012. *The Incentive Effects of Marginal Tax Rates: Evidence from the Interwar Era*. Technical report. Berkeley: University of California.
- Stevenson, Richard W. 2013. "Governors Push Bigger Reliance on Sales Taxes." *New York Times*, January 24, A:1.
- Story, Louise. 2012. "As Companies Seek Tax Deals, Governments Pay High Price." *New York Times*, January 1. <http://www.nytimes.com/2012/12/02/us/how-local-taxpayers-bankroll-corporations.html?pagewanted=all> (accessed October 1, 2014).
- Syverson, Chad. 2011. "What Determines Productivity?" *Journal of Economic Literature* 49(2): 326–365.