

Do State Corporate Income Taxes Reduce Wages?

By R. Alison Felix

Amid falling revenues and impending budget shortfalls, state policymakers must find ways to increase revenue, cut spending, or both. At the same time, they must develop policies that attract or keep businesses and jobs. Some policymakers may consider raising corporate tax rates because it avoids directly taxing workers who are already suffering the effects of this recession. But as states reevaluate their current tax policy, it is important to consider the effects of each tax component. One important question is: Who will bear the burden of the taxes?

State corporate income taxes are complex, and thus the answer to this question is far from obvious. Many believe that the state corporate tax structure is highly progressive because the corporate capital taxed is owned disproportionately by wealthy individuals. In today's economy, however, the burden of the corporate tax may have shifted to consumers or labor, resulting in a less progressive tax structure.

Research has shown that in some cases labor bears a substantial weight of the corporate tax. While this burden has fluctuated over time, the relationship between corporate taxes and wages has been consis-

R. Alison Felix is an economist at the Federal Reserve Bank of Kansas City. Adam Pope, a research associate at the bank, helped prepare this article. This article is on the bank's website at www.KansasCityFed.org.

tently negative. In other words, higher corporate taxes are typically associated with lower wages.

This article examines the impact of state corporate taxes on wages. The first section of the article discusses the evolution of the state corporate tax. The second section explores who bears the burden of the tax. The third section uses empirical analysis to show that corporate taxes reduce wages and that the magnitude of the negative relationship between the taxes and wages has increased over the past 30 years. The analysis also finds that state corporate taxes have a larger negative effect on more highly educated workers.

I. HOW DO STATES TAX CORPORATIONS?

State corporate taxes were designed in the first half of the 20th century. The objectives of those early forms of the tax continue to influence current state corporate tax policy and its structure. But today's corporate tax programs continue to evolve, and their complexity makes it difficult to evaluate the impact of corporate income taxes.

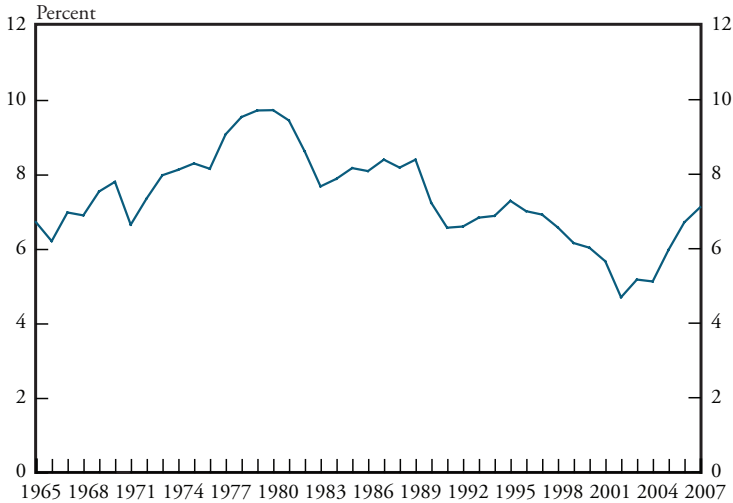
The evolution of state corporate taxes

Taxing income had been tried several times in the New World, starting with the Massachusetts Bay Colony in 1643. But no income tax was able to generate a substantial amount of revenue until 1911, when Wisconsin became the first state to levy a successful corporate income tax (Stark).¹ The goal of Wisconsin policymakers was to distribute the tax burden more justly. At the time, the property tax was the main tax revenue source for states. Personal property was often difficult to assess, however, and much property escaped taxation. In addition, many high-salaried workers did not own much property, and many believed these workers were not paying their fair share of taxes. The corporate and individual income taxes sought to alleviate these problems (Kinsman).

The success of Wisconsin's income tax soon led other states to adopt similar taxes. By 1930, 23 states had adopted a corporate income tax, and within ten years 40 states were taxing corporate income (Brunori and Cordes). Today, Nevada, Wyoming, and Washington are the only states that do not tax corporate income.²

Chart 1

STATE CORPORATE TAX REVENUES AS A SHARE OF STATE TOTAL TAX REVENUES, 1965 – 2007



Source: U.S. Census Bureau

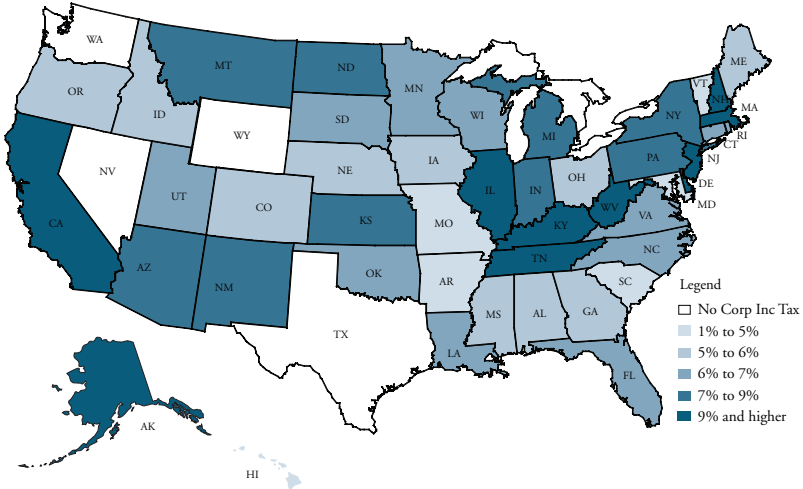
Over the past 40 years, states' reliance on corporate tax revenue has varied (Chart 1). Overall, the share of total state tax revenues coming from the corporate tax peaked in 1980 at almost 10 percent. By 2002, the corporate tax share of total tax revenues had fallen to less than 5 percent, a decline largely driven by competition among states vying for new businesses. The viability and importance of the state corporate tax seemed to be permanently declining. But during the last five years, the magnitude of the state corporate tax revenue has increased.

Structure of state corporate taxes today

On average, corporate tax revenues make up about 7 percent of total state tax revenues. But reliance on corporate taxes differs from state to state (Figure 1). In 2007, Hawaii collected the smallest share of state tax revenues from corporate taxes, about 2 percent.³ At the opposite end of the spectrum, Alaska and New Hampshire collected 24 and 27 percent, respectively. Among the states that tax corporate income, the highest marginal tax rate ranged from 4.63 percent in Colorado to 12 percent in Iowa (Figure 2).⁴

Figure 1

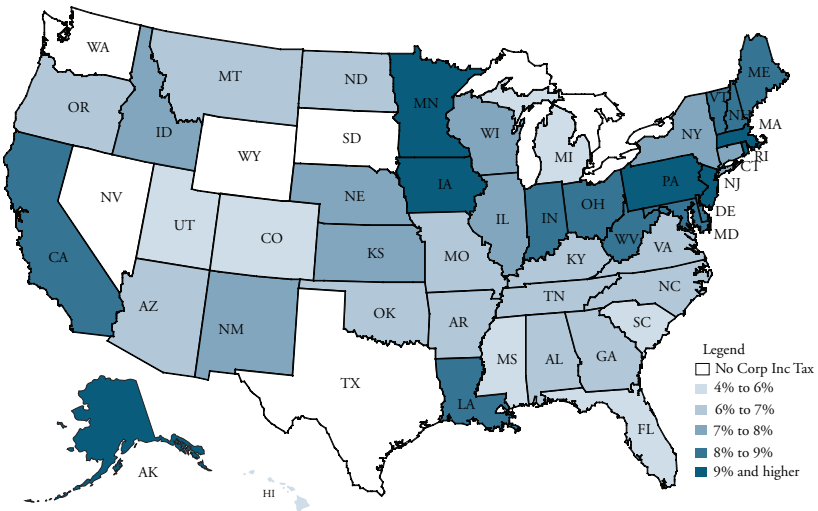
STATE CORPORATE TAX REVENUE SHARE OF TOTAL STATE TAX REVENUES, 2007



Source: U.S. Census Bureau

Figure 2

HIGHEST MARGINAL STATE CORPORATE TAX RATES, 2009



Source: Tax Foundation

Note: South Dakota does not impose a corporate income tax on all corporations, but banks are required to pay a 6 percent tax on income.

The progressivity of the corporate income tax structure also varies. Today, 31 states tax corporate income at a flat rate. The remaining 16 states have multiple tax brackets. In Alaska, for example, each of ten income tax brackets has a different marginal tax rate.

As corporations expand and become multistate operations, determining what profit is taxable becomes a major complication. In other words, states must decide what fraction of a company's income was earned in their state and is therefore taxable. This apportionment focuses on three factors: company payroll, property, and sales. Corporations must report what fractions of their total payroll, property, and sales occur within each individual state. The states place a weight on each of these factors, and the weights differ from state to state. Most states apportion corporate income in one of three ways: equal weights on each of the three factors (all receive 33.3 percent weight), double weight on the sales factor (payroll and property each receive a 25 percent weight and sales a 50 percent weight), or full weight on sales (sales receive 100 percent).⁵ The trend in apportioning income has been to move toward a heavier weight on sales. By focusing on sales, policymakers hope to entice firms to locate in their state to create jobs (with a lower payroll weight) and build new facilities (with a lower property weight).

Another complication of taxing multistate corporations is that many corporations sell products in states where they do not have a physical presence, or *nexus*.⁶ If a corporation has sales in a state, but not nexus, that sales income would not be apportioned to any state for corporate tax purposes. Almost half of states impose a throwback rule, however, which allows the state where the corporation is domiciled to claim this untaxed sales income for tax purposes.

There are also other related complications. States must determine what they will use for a tax base. Most states use the federal corporate taxable income as their base.⁷ Some states allow deductions for depreciation, federal taxes, foreign taxes, compensation expenses, and the cost of goods sold. In addition, some states allow corporations to apply the current year's operating loss to taxable profits in previous or future years (called loss carryback or carryforward). This policy reduces the corporation's tax liability. The number of years and the amount of the loss that can be carried forward or back vary among states. Many states offer tax credits for job creation, research and development, and investment. In

a number of states, income brackets are indexed for inflation. Six states impose a corporate alternative minimum tax (Barro).

Other state taxes can also affect corporations. Seven states impose a gross receipts tax, which taxes corporations based on their gross revenues rather than profits (Barro). Individual income taxes, sales taxes, property taxes, franchise taxes, and unemployment insurance taxes also affect the corporate bottom line.

II. WHO PAYS FOR CORPORATE TAXES?

Corporations are responsible for remitting corporate taxes to the state, but the actual burden of the state corporate tax falls elsewhere—on shareholders, consumers, workers, or some combination of the three.

Corporate and noncorporate shareholders

Many believe that shareholders, or owners of capital, bear the burden of the corporate income tax. These corporate shareholders will pay the corporate tax in the form of lower profits if corporations are unable to shift the burden of the tax. However, it is not just owners of corporate capital who may bear the burden.

In 1962, Harberger theorized that in a closed economy the burden of the federal corporate tax would be shared entirely by both corporate and noncorporate capital owners. If capital in the corporate sector is taxed, the after-tax return to capital in the corporate sector will decrease. Capital will move to the noncorporate sector in pursuit of higher returns until the after-tax returns have equalized across the corporate and noncorporate sectors. This increase in capital in the noncorporate sector will decrease the marginal productivity of capital in that sector, resulting in a lower return. Similarly, as capital leaves the corporate sector, the marginal productivity of capital in that sector will rise. Labor can move between sectors to ensure that wages will not change due to changes in the amount of capital. Thus, the burden of the corporate tax falls entirely on capital in both the corporate and noncorporate sectors in a closed economy (an economy without trade).

Many economists believe that the corporate tax burden shifts at least partly to other factors of production. But many still assume that capital bears the entire burden of the tax. The U.S. Department of the Treasury and the Congressional Budget Office both use this assump-

tion when assessing the distributional impact of taxes at the federal level (Cronin). The uncertainty of who bears the burden of the corporate tax led the Joint Committee on Taxation to ignore the corporate tax when calculating its distributional analyses.⁸

Consumers

Consumers may also bear some of the burden of the state corporate tax in the form of higher prices for products and services. Many argue that corporate taxes essentially raise the cost of production for corporations and that corporations in turn raise prices to compensate for that additional cost. Economists disagree on whether corporations raise prices in response to corporate taxes, however, and empirical research has not settled the question.

One economic theory states that because corporate income taxes are assessed on profits and not revenues, the corporate income tax should not affect production levels or prices of goods in the short run (Goode). Others argue, however, that the corporate income tax is assessed on normal profits (as opposed to pure profits) and therefore, corporations will raise prices to compensate for higher corporate income taxes.⁹

Prices of corporate goods may also increase because a tax on corporations results in a smaller corporate sector and a larger noncorporate sector.¹⁰ This reallocation of capital from the corporate to noncorporate sector has the effect of decreasing the number of corporate goods and increasing the number of noncorporate goods. This change in quantity causes the price of corporate goods to increase relative to the price of noncorporate goods (Blinder).

Workers

The most recent economic research suggests that labor bears the majority of the corporate tax burden at the national level.¹¹ In response to higher state corporate tax rates, corporations may lower wages, thereby passing the burden onto workers.

Corporations use capital and labor to produce goods and services. In a competitive market, the return to capital is equal to the marginal productivity of capital, and the wage is equal to the marginal productivity of labor. In the United States, capital is mobile, and this capital mobility ensures that the return to capital will be equal across

states. Therefore, if a tax on capital is levied in one state, it cannot affect the return to capital, as shown below.¹²

$$\text{Return to Capital} = (1 - \tau) * \text{Marginal Productivity of Capital}$$

If the tax on capital (τ) is increased, the marginal productivity of capital must increase to keep the return to capital the same as could be earned in other states. This occurs as capital flees the state in pursuit of a higher return. The decrease in capital will increase the marginal productivity of capital in the home state, and investors will continue to pursue outside opportunities until the marginal productivity of capital has increased to the point where the above equation holds.

Thus, the state corporate tax encourages capital to depart the state, leaving workers in that state with less capital to use. With less capital, workers are less productive (that is, the marginal productivity of labor declines) and therefore earn lower wages. In this way, a tax on capital can be borne entirely by labor in an open economy.¹³

The burden of the state corporate tax may differ among workers, especially across education levels. Additional capital increases the productivity of high-skilled (or educated) workers more than less-skilled workers.¹⁴ For example, highly educated workers often use technology to perform their jobs. For many of these workers, having access to the newest technology makes them more productive. As capital leaves a state in response to higher corporate taxes, this may hurt the productivity of high-skilled workers more than low-skilled workers.

Past research: Does labor bear the burden?

Most of the economic literature examining the impact of corporate taxes on wages has focused on national corporate tax rates. Using a theoretical model, labor's burden from the corporate tax is predicted to be 2 to 2.5 times as large as the tax revenue collected in an open economy (Harberger 1995). Several recent studies use empirical analysis to determine the effect of national corporate taxes on wages.¹⁵ Research on manufacturing firms found that wages fall 1 percent in response to a 1 percent increase in the corporate tax rate (Hassett and Mathur). Similar research on firms in general found that a one-percentage-point increase in the corporate tax rate decreases wages by 0.7 percent (Felix). A study that focused on estimating labor's share of the corporate tax burden

found that in the long run, labor bears close to 100 percent of the corporate tax burden (Arulampalam, Devereux and Maffini). All of these studies used different data and methodologies—yet they all concluded that labor bears a substantial burden of the national corporate tax.

The empirical economic literature on the effects of state corporate taxes has also found strong evidence of corporate taxes shifting toward labor. One study using 1980 data on wages from 125 U.S. cities found that a one-percentage-point increase in the state corporate tax rate reduces annual wages by about 1 percent (Gyourko and Tracy).

The next section of this article seeks to update and extend the Gyourko and Tracy analysis in several ways.¹⁶ First, by using 29 years of data, spanning 1977 to 2005, the current analysis is able to identify the more recent effects of state corporate taxes on wages and analyze how the burden on labor has changed over time. In addition, this article examines the effect of corporate taxes across different education groups to help explain the distribution of the state corporate tax burden.

III. THE EFFECTS OF STATE CORPORATE TAXES ON WAGES

Empirical analysis shows that corporate taxes reduce wages, and the magnitude of this effect increases over time. The results also find that high-skilled workers bear a larger burden from the corporate income tax than low-skilled workers.

Measuring the effect of corporate taxes on wages

A simple regression model shows that an individual's wage depends on state taxes, individual traits, and state characteristics.¹⁷ In other words, the regression model allows us to estimate the impact of state corporate taxes on wages, while controlling for other factors that also influence the wage rate.

$$\begin{aligned} \ln(\text{wage}) = & \alpha + \beta(\text{Tax Variables}) + \delta(\text{Individual Characteristics}) \\ & + \gamma(\text{State Characteristics}) + \varepsilon \end{aligned}$$

The basis of the data is individual-level data from the Current Population Survey and covers the years 1977 to 2005.¹⁸ The dependent variable in all of the regressions is the individual wage rate, adjusted for inflation.^{19,20} Many individual characteristics affect wages, includ-

ing educational attainment.²¹ Vast economic literature has shown that additional schooling increases wages. But to date, no studies have investigated how state corporate taxes influence wages of workers with different educational levels.^{22,23} This analysis divides individuals into three groups: those with less than a high school diploma, those with a high school diploma but without a college degree, and those with at least a bachelor's degree.²⁴

As discussed in the previous section, state-level corporate tax rates are likely to have a negative impact on wages, but other state taxes are also likely to have an effect.²⁵ One difficulty that arises in economic tax research is choosing the correct tax rate to use in the analysis.²⁶ The regressions in this analysis use the highest marginal corporate tax rate because this is the most reliable state corporate tax rate available.²⁷

State-level characteristics may also affect wages. Workers might be willing to accept lower wages if states offer desirable amenities. Conversely, employers might offer higher wages to attract workers to less-desirable locations.²⁸ In addition to collecting taxes, states provide public goods and services, which may also attract workers and affect wages.²⁹

How much do state corporate taxes lower wages?

The hypothesis that state corporate tax rates have a negative effect on wages is confirmed in Table 1. Column 1 shows the results from regressing the wage rate on tax rates, as well as on individual and state variables. Column 2 adds controls for three weather-related factors, while column 3 adds controls for three measures of government services.³⁰

As expected, the marginal state corporate tax rate has a negative effect on wages. The coefficient on the state corporate tax rate is significant at the 1 percent level in all three regressions. A one-percentage-point increase in the marginal state corporate tax rate reduces wages 0.14 to 0.36 percent. This is a sizable effect, but smaller than the effect found by Gyourko and Tracy. Part of this difference may be explained by the fact that Gyourko and Tracy looked at annual wages and thus picked up changes in wage and employment.³¹

The results in the first two columns show that companies in states with higher individual income tax rates do pay higher wages.³² This result implies that individuals are able to pass along some of the burden

Table 1

THE EFFECT OF STATE CORPORATE TAXES ON WAGES
(Dependent Variable: Ln(Wage Rate))

Independent Variables	(1)	(2)	(3)
Intercept	1.39 ***	1.41***	1.41***
Highest Marginal State Corporate Tax Rate	-.36 ***	-.14 ***	-.17 ***
Marginal State Individual Income Tax Rate	.25 ***	.06 **	-.04
State Sales Tax Rate	-.02	-.09 *	-.10 *
Age	.05 ***	.05 ***	.05 ***
Age Squared	.00 ***	.00 ***	.00 ***
Dummy for Male	.25 ***	.25 ***	.26 ***
Dummy for Married	.11 ***	.11 ***	.11 ***
Dummy for White	.07 ***	.07 ***	.06 ***
Dummy for Metro Area	.14 ***	.14 ***	.13 ***
Dummy for Less Than High School Diploma	-.46 ***	-.46 ***	-.46 ***
Dummy for High School Diploma or Some College	-.25 ***	-.25 ***	-.25 ***
Dummy for Occupation	Yes	Yes	Yes
Dummy for Industries	Yes	Yes	Yes
Dummy for Year	Yes	Yes	Yes
Dummy for Census Division	Yes	Yes	Yes
Weather	No	Yes	Yes
Government Services	No	No	Yes
R-Squared	39.63%	39.67%	39.56%
Number of Individuals	1,150,966	1,150,966	874,826

Note: The statistical significance for the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

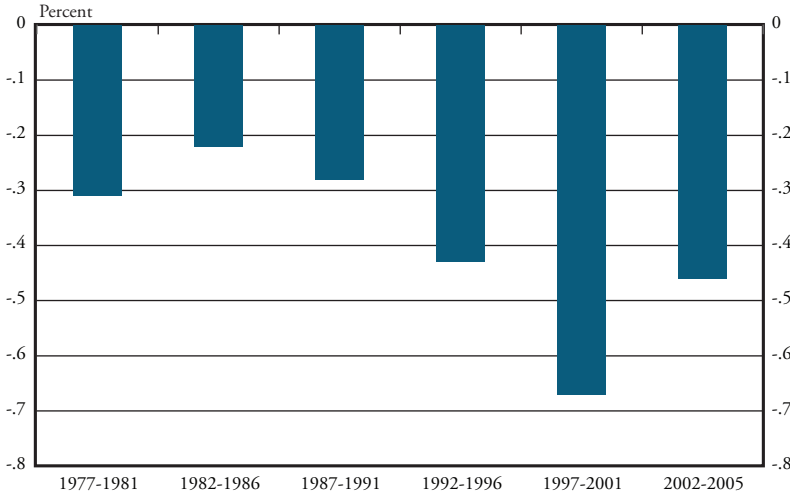
of the individual income tax onto other factors. The coefficients on the state sales tax imply that increases in the sales tax rate slightly reduce wages. This indicates that consumers are not able to pass along the burden of the sales tax to their employers. The individual characteristics of workers affect wages as expected.³³

The effect of state corporate taxes over time

To see how the burden of state corporate taxes has changed over time, the regression from Table 1, column 1 is duplicated for each five-year time period since 1977 (Appendix Table A2).³⁴ The state corporate tax rate has a significant and negative effect on wages in every time period as shown in Chart 2. In response to a one-percentage-point increase in the state corporate tax rate, wages fell between 0.22 and 0.67 percent.

Chart 2

THE EFFECT OF STATE CORPORATE TAXES ON WAGES OVER TIME



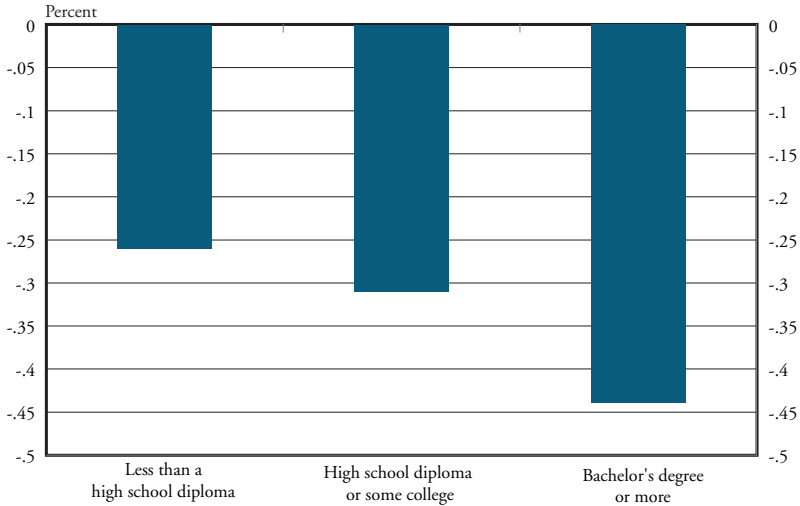
Note: This chart shows the decline in wage rates as a result of a one-percentage-point increase in the state corporate income tax rate.

Although the effect of state corporate taxes on wages has fluctuated over time, the magnitude of the effect trended upward from 1977 to 2005. Between 1977 and 1991, a one-percentage-point increase in the state corporate tax rate reduced wages 0.27 percent, on average. In comparison, from 1992 to 2005, a one-percentage-point increase in the state corporate tax rate decreased wages 0.52 percent, on average. This jump may be due in part to increasing global competition. In 1977, total trade (exports plus imports) in the United States amounted to almost 17 percent of GDP. By 2005, this number had increased to over 30 percent. This jump in global trade suggests that the after-tax return to capital must be equalized, not only among states, but also across countries.

Another possible explanation for the additional burden on labor from the state corporate tax is the increasing competition among states to attract businesses. Over the past 30 years, businesses have become more mobile, and thus states have intensified their efforts to attract companies (Farrell). During this time period, the average number of state incentive programs more than doubled and recruitment subsidies increased (Farrell). As states offer more and more to attract businesses, corporations may have become even more responsive to state corporate

Chart 3

THE EFFECT OF STATE CORPORATE TAXES ON WAGES BY EDUCATION LEVEL



Note: This chart shows the decline in wage rates as a result of a one-percentage-point increase in the state corporate income tax rate.

income taxes. According to a KPMG report, improvements in transportation, communication and trade have made it easier for corporations to base their location decisions on places that offer the “best combination of price and value” (Wunder).

The effect of state corporate taxes by education group

Knowing that some of the state corporate tax burden is passed onto labor is only part of understanding the progressivity of state corporate income taxes. It is also important to know how corporate taxes affect workers with different educational or skill levels. Appendix Table A3 shows regression results for each education group. The state corporate tax rate has a significant and negative effect on the wages of each education group (Chart 3).

The state corporate tax rate has a larger effect on wages as education levels increase. A one-percentage-point increase in the marginal state corporate tax rate reduces the wages of college-educated (or higher) workers 0.44 percent, high-school educated (or some college) workers 0.31 percent, and workers without a high school diploma 0.26 percent.

Thus, when some capital leaves a state in response to higher corporate taxes, the most highly skilled workers experience the largest decline in productivity and thus the largest decline in wages.

This result suggests that the burden of the state corporate income tax is progressive. In other words, the tax burden as a percent of income is higher for higher-income workers. Still, all workers bear some of the corporate tax burden. Therefore, the state corporate tax is less progressive than it would be if the burden fell solely on shareholders.

In addition to helping explain the progressivity of the state corporate income tax, the fact that highly educated workers bear a larger share of the corporate tax burden may have implications for the attraction and retention of such workers. By reducing the wages of highly educated workers, state corporate taxes may reduce the number of highly educated workers that choose to locate in a given state.

IV. CONCLUSION

The incidence of a tax does not always fall on those responsible for remitting the tax. In the case of the state corporate income tax, labor bears a significant burden from the tax in the form of lower wages. Regression analysis shows that a one-percentage-point increase in the marginal state corporate tax rate reduces wages 0.14 to 0.36 percent. Labor's burden from the state corporate tax has trended upward over time. In the 1990s and early 2000s, wages began falling more in response to higher corporate tax rates than in the late 1970s and 1980s. This result may be explained by increased global competition and increased competition among states to attract businesses.

State corporate taxes reduce the wages of highly educated workers by a larger percentage than less-educated workers. This difference is consistent with the view that additional capital increases the productivity of highly skilled labor more than that of lower-skilled workers. This finding is important because, as the burden of the corporate tax has shifted to labor, some of the tax's progressivity remains. Because the state corporate tax has a negative effect on the wages of all education groups, however, the tax is likely less progressive than originally thought.

A separate question arises as state corporate income taxes create incentives for corporations and individuals to change their behavior to avoid taxes. Do these behavioral changes create inefficiencies? The answer is

yes, for several reasons. A corporate tax creates an inefficient allocation of capital between corporate and noncorporate firms within a state. In addition, the mobility of capital leads to an inefficient allocation of capital among states, as capital flees states that impose higher corporate taxes. Finally, because state corporate taxes reduce wages, they may also influence the attraction and retention of highly educated workers.

APPENDIX

Table A1
STATE CORPORATE INCOME TAX STRUCTURE, FISCAL YEAR 2009

State	Highest Marg Corp Tax Rate	Number of Brackets	Apportionment Weights (Sales / Prop / Payroll)	Throwback Rule	Federal Tax Deductible	Gross Receipts Tax Rate
Alabama	6.50%	1	33.3% / 33.3% / 33.3%	Yes	Yes	None
Alaska	9.40%	10	33.3% / 33.3% / 33.3%	Yes	No	None
Arizona	6.97%	1	70% / 15% / 15%	No	No	None
Arkansas	6.50%	6	50% / 25% / 25%	Yes	No	None
California	8.84%	1	50% / 25% / 25%	Yes	No	None
Colorado	4.63%	1	33.3% / 33.3% / 33.3% or 50% / 0%	Yes	No	None
Connecticut	7.50%	1	50% / 25% / 25% or 100% / 0%	No	No	None
Delaware	8.70%	1	33.3% / 33.3% / 33.3%	No	No	0.58%
Florida	5.50%	1	50% / 25% / 25%	No	No	None
Georgia	6%	1	100% / 0% / 0%	No	No	None
Hawaii	6.40%	3	33.3% / 33.3% / 33.3%	Yes	No	None
Idaho	7.60%	1	50% / 25% / 25%	Yes	No	None
Illinois	7.30%	1	100% / 0% / 0%	Yes	No	None
Indiana	8.50%	1	70% / 15% / 15%	Yes	No	None
Iowa	12%	4	100% / 0% / 0%	No	Yes (50%)	None
Kansas	7.35%	2	33.3% / 33.3% / 33.3%	Yes	No	None
Kentucky	6%	3	50% / 25% / 25%	No	No	0.10%
Louisiana	8%	5	100% / 0% / 0%	No	Yes	None
Maine	8.93%	4	100% / 0% / 0%	Yes	No	None

State	Highest Marg Corp Tax Rate	Number of Brackets	Apportionment Weights (Sales / Prop / Payroll)	Throwback Rule	Federal Tax Deductible	Gross Receipts Tax Rate
Maryland	8.25%	1	50% / 25% / 25% or 100% / 0% / 0%	No	No	None
Massachusetts	9.50%	1	50% / 25% / 25%	Yes	No	None
Michigan	6.04%	1	100% / 0% / 0%	No	No	0.98%
Minnesota	9.80%	1	81% / 9.5% / 9.5%	No	No	None
Mississippi	5%	3	33.3% / 33.3% / 33.3% or 50% / 25% / 25% or 100% / 0% / 0%	Yes	No	None
Missouri	6.25%	1	33.3% / 33.3% / 33.3% or 100% / 0% / 0%	Yes	Yes (50%)	None
Montana	6.75%	1	33.3% / 33.3% / 33.3%	Yes	No	None
Nebraska	7.81%	2	100% / 0% / 0%	No	No	None
Nevada	None	None	None	N/A	No	None
New Hampshire	8.50%	1	50% / 25% / 25%	Yes	No	0.75%
New Jersey	9.36%	3	50% / 25% / 25%	No	No	None
New Mexico	7.60%	3	50% / 25% / 25% or 33.3% / 33.3% / 33.3%	Yes	No	None
New York	7.10%	1	100% / 0% / 0%	No	No	None
North Carolina	6.90%	1	50% / 25% / 25%	No	No	None
North Dakota	6.50%	5	33.3% / 33.3% / 33.3%	Yes	Yes	None
Ohio	3.40%	2	60% / 20% / 20%	No	No	0.21%
Oklahoma	6%	1	33.3% / 33.3% / 33.3%	Yes	No	None
Oregon	6.60%	1	100% / 0% / 0%	Yes	No	None
Pennsylvania	9.99%	1	70% / 15% / 15%	No	No	None
Rhode Island	9%	1	33.3% / 33.3% / 33.3%	Yes	No	None
South Carolina	5%	1	50% / 25% / 25% or 100% / 0% / 0%	No	No	None

State	Highest Marg Corp Tax Rate	Number of Brackets	Apportionment Weights (Sales / Prop. / Payroll)	Throwback Rule	Federal Tax Deductible	Gross Receipts Tax Rate
South Dakota	None	None	None	N/A	No	None
Tennessee	6.50%	1	50% / 25% / 25%	No	No	None
Texas	None	None	100% / 0% / 0%	Yes	No	1.00%
Utah	5%	1	33.3% / 33.3% / 33.3% or 50% / 25% / 25%	Yes	No	None
Vermont	8.75%	3	50% / 25% / 25%	Yes	No	None
Virginia	6%	1	50% / 25% / 25%	No	No	None
Washington	None	None	None	No	No	0.48%
West Virginia	8.75%	1	50% / 25% / 25%	No	No	None
Wisconsin	7.90%	1	100% / 0% / 0%	Yes	No	None
Wyoming	None	None	None	N/A	No	None
District of Columbia	9.98%	1	33.3% / 33.3% / 33.3%	Yes	No	None

Sources: Tax Foundation; Federation of Tax Administrators

Table A2
THE EFFECT OF STATE CORPORATE TAXES ON WAGES OVER TIME
 (Dependent Variable: Ln(Wage Rate))

Independent Variables	1977-1981	1982-1986	1987-1991	1992-1996	1997-2001	2002-2005
Intercept	0.82 ***	0.05 ***	0.71 ***	0.56***	1.18 ***	1.71 ***
Highest Marginal State Corporate Tax Rate	-0.31 ***	-0.22 ***	-0.28 ***	-0.43 ***	-0.67 ***	-0.46 ***
Marginal State Individual Income Tax Rate	0.24 ***	-0.03	0.42 ***	0.48 ***	0.61 ***	0.51 ***
State Sales Tax Rate	-0.04	0.10	0.18 *	0.51 ***	0.43 ***	0.31 ***
Age	0.05 ***	0.06 ***	0.06 ***	0.06 ***	0.05 ***	0.05 ***
Age Squared	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***	0.00 ***
Dummy for Male	0.35 ***	0.31 ***	0.26 ***	0.22 ***	0.23 ***	0.21 ***
Dummy for Married	0.10 ***	0.09 ***	0.10 ***	0.10 ***	0.11 ***	0.11 ***
Dummy for White	0.09 ***	0.08 ***	0.08 ***	0.08 ***	0.06 ***	0.06 ***
Dummy for Metro Area	0.12 ***	0.12 ***	0.17 ***	0.14 ***	0.13 ***	0.14 ***
Dummy for Less Than High School Diploma	-0.33 ***	-0.40 ***	-0.42 ***	-0.47 ***	-0.53 ***	-0.56 ***
Dummy for High School Diploma or Some College	-0.116 ***	-0.20 ***	-0.21 ***	-0.24 ***	-0.28 ***	-0.31 ***

Table A2 Continued

Independent Variables	1977-1981	1982-1986	1987-1991	1992-1996	1997-2001	2002-2005
Dummy for Occupation	Yes	Yes	Yes	Yes	Yes	Yes
Dummy for Industries	Yes	Yes	Yes	Yes	Yes	Yes
Dummy for Year	Yes	Yes	Yes	Yes	Yes	Yes
Dummy for Census Division	Yes	Yes	Yes	Yes	Yes	Yes
Weather	No	No	No	No	No	No
Government Services	No	No	No	No	No	No
R-Squared	43.10%	41.55%	41.58%	40.08%	38.66%	38.10%
Number of Individuals	191,378	190,787	191,544	181,602	175,457	220,198

Note: The statistical significance for the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

Table A3
THE EFFECT OF STATE CORPORATE TAXES ON WAGES BY EDUCATION LEVEL
 (Dependent Variable: Ln (Wage Rate))

Independent Variables	Low Educ.	Middle Educ.	High Educ.
Intercept	1.08 ***	0.87 ***	0.63 ***
Highest Marginal State Corporate Tax Rate	-0.26 ***	-0.31 ***	-0.44 ***
Marginal State Individual Income Tax Rate	0.30 ***	0.17 ***	0.45 ***
State Sales Tax Rate	-0.68 ***	0.01	0.43 ***
Age	0.04 ***	0.05 ***	0.07 ***
Age Squared	0.00 ***	0.00 ***	0.00 ***
Dummy for Male	0.28 ***	0.26 ***	0.21 ***
Dummy for Married	0.10 ***	0.09 ***	0.13 ***
Dummy for White	0.04 ***	0.08 ***	0.06 ***
Dummy for Metro Area	0.09 ***	0.13 ***	0.20 ***
Dummy for Occupation	Yes	Yes	Yes
Dummy for Industries	Yes	Yes	Yes
Dummy for Year	Yes	Yes	Yes
Dummy for Census Division	Yes	Yes	Yes
Weather	No	No	No
Government Services	No	No	No
R-Squared	30.63%	31.89%	28.51%
Number of Individuals	168,994	733,893	248,079

Note: The statistical significance for the 1%, 5%, and 10% levels are denoted by ***, **, and *, respectively.

ENDNOTES

¹Wisconsin enacted an individual income tax at the same time.

²Texas does not have a corporate income tax but does impose a gross receipts tax on corporations. This tax acts as a corporate income tax but taxes gross receipts as opposed to profits.

³Hawaii collected the smallest share of state tax revenues among states that impose a state corporate income tax.

⁴Appendix Table A1 presents corporate tax rates and structure characteristics for each state.

⁵The current apportionment weights are presented for each state in Appendix Table A1.

⁶Nexus requires sufficient physical presence. Determining if a corporation has nexus is a complicated legal issue.

⁷The Tax Foundation's State Business Tax Climate Index provides more information about the corporate tax structure of individual states.

⁸This fact was noted by Cronin and can be found in a 1997 document published by the Joint Committee on Taxation (in footnote 3 from JCX-41-97).

⁹Auld and Miller provide an explanation of this argument.

¹⁰This is a result of the Harberger model (Blinder).

¹¹Gentry provides a summary of this literature.

¹²A tax in one state cannot affect the return to capital as long as the state is sufficiently small.

¹³This argument assumes that labor is at least partially immobile.

¹⁴Griliches finds that skilled labor is more complementary with capital than unskilled labor.

¹⁵Gentry provides an overview of these recent contributions, including Arulampalam, Devereaux and Maffini; Felix; and Hassett and Mathur.

¹⁶Gyourko and Tracy focused on city-level variation. This article uses variation at the state level. There are other minor differences to the empirical analysis, but the overall approach is similar.

¹⁷The regression used in this article is similar in form to the regressions used by Gyourko and Tracy.

¹⁸This data is available from IPUMS.

¹⁹The individual wage rate is calculated using the annual salary divided by the number of hours worked per week and the number of weeks worked per year.

²⁰Some studies have used the annual wage; however, this would pick up the effects of the corporate tax on both employment and wages. The effects on employment and wages are both interesting questions. However, the focus of this paper is on wages.

²¹In addition to educational attainment, an individual's age, age-squared, gender, race, and marital status affect wages. Wages also increase as individuals gain experience. Wages tend to grow more quickly at the beginning of careers

than toward the end. The number of years of experience is not available in the data, so age is used to approximate experience. In addition, an age-squared term is included to account for the expected decline in the pace of wage increases later in a career. Studies have found that males tend to make more than females, and whites usually make more than non-whites, holding all else constant. The occupation and industry of an individual also influences wages. Workers who live in metropolitan areas usually earn higher wages to compensate for the higher cost of living.

²²Card provides a detailed summary of this literature.

²³Felix examines the effects of national corporate income tax rates on workers of different education levels.

²⁴These individuals are classified as having a low education, middle education or high education, respectively.

²⁵If workers are able to avoid some of the burden of the personal income tax, wages would be higher in states with higher personal income tax rates. If workers do not bear the full burden of the individual income tax, they must earn higher wages pre-tax so that after-tax wages fall by less than the full amount of the tax. Also, if consumers do not bear the full burden of sales taxes, wages would be higher in states with higher sales tax rates.

²⁶For state corporate taxes, it is the marginal effective corporate tax rate that impacts wages. Unfortunately, the complexity of corporate tax structures prevents good data from existing on this rate.

²⁷The highest marginal corporate tax rate is available in the World Tax Database provided by the Office of Tax Policy Research at the University of Michigan. Since most states have top brackets that start at fairly low levels of profit, it is a good approximate to the desired rate (Gyourko and Tracy). However, this rate does not account for differences in the corporate tax base that are influenced by apportionment weights, deductions and credits. The marginal state individual income tax rate is calculated for each individual by using the average national wage within an education group. This tax rate was calculated using TAXSIM, which is available from the National Bureau of Economic Research. The average national wage was calculated for each education group in each year. This wage was submitted to TAXSIM for each state. Therefore, the individual income tax rate varies by state, year, and education. The average national wage was used instead of the individual wage to avoid endogeneity problems. The general sales tax rate is widely available and was obtained from the World Tax Database.

²⁸It is impossible to control for all of the amenities available in each state, and in addition, preferences for various amenities may differ across individuals. Still, it is important to include several variables in the regression to attempt to control for differences across states. One big attraction or deterrent for many individuals is weather. Therefore, some of the regressions look at the impact of warm weather, cold weather, and the number of days with precipitation.

²⁹Education is one service that is highly valued by many individuals. It is difficult to measure the quality of education, but one rough indicator is the student-to-teacher ratio. Other desirable features include low crime rates and good hospitals. The quality of hospitals is also difficult to measure. In the regressions, the number of physicians per 100,000 civilian population is used.

³⁰The student-to-teacher ratio and the physician rate are not available for all years in the data. Therefore, the number of observations is lower in Column 3 than in the first two columns.

³¹The empirical framework in this paper is similar to that used by Gyourko and Tracy. However, there are a couple of key differences. First, they focused on wages within cities and therefore eliminated individuals who did not live in one of 125 cities. Second, their data consisted of one year, 1980. This article gains some variation in the tax rates over time by looking at data from 1977 to 2005.

³²The coefficient on the state marginal individual income tax rate is negative in column 3, but the result is not significant at the 10 percent level.

³³After controlling for other factors, wages are shown to increase with age. In addition, men earn about 25 percent more than women, whites earn 7 percent more than non-whites, and married workers earn 11 percent more than single workers. Individuals with a high school diploma or some college are estimated to earn 25 percent less than college graduates, and individuals with less than a high school diploma earn 46 percent less than college graduates. Workers living in a metropolitan area also earn about 14 percent more than those living outside these areas. One reason for this disparity is the difference in the cost of living.

³⁴The last grouping is a four-year time period.

REFERENCES

- Alexander, Trent, Miriam King, Donna Leicach, Steven Ruggles, and Matthew Sobek. Integrated Public Use Microdata Series, Current Population Survey: Version 2.0. Minneapolis, MN: Minnesota Population Center, 2004, cps.ipums.org/cps.
- Altonji, Joseph G. and Rebecca M. Blank. 1999. "Race and Gender in the Labor Market," in O. Ashenfelter and R. Layard, eds., *Handbook of Labor Economics*, 3. Cambridge, MA: Elsevier Science Publishers.
- Arulampalam, Wiji, Michael P. Devereux, and Giorgia Maffini. 2007. "The Direct Incidence of Corporate Income Tax on Wages," Working Paper, Oxford University Centre for Business Taxation, July.
- Atkins, Chris. 2005. "A Twentieth Century Tax in the Twenty-First Century: Understanding State Corporate Tax Systems," The Tax Foundation, Background Paper 49, September.
- Auerbach, Alan J. 2006. "Who Bears the Corporate Tax? A Review of What We Know," *NBER/Tax Policy & the Economy*, vol. 20, pp. 1-40.
- Auld, Douglas Allen Lauriston and F.C. Miller. 1975. *Principles of Public Finance: A Canadian Text*. Toronto, Canada: Taylor and Francis.
- Barro, Joshua. 2008. "2009 State Business Tax Climate Index," The Tax Foundation, Background Paper 58, October.
- Blinder, Alan S. 1974. *The Economics of Public Finance*. Washington, D.C.: The Brookings Institution.
- Brunori, David and Joseph J. Cordes. 2005. "The State Corporate Income Tax: Recent Trends for a Troubles Tax," American Institute of Tax Policy, August 15, 2005.
- Card, David. 1999. "The Causal Effect of Education on Earnings," in O. Ashenfelter and R. Layard, eds., *Handbook of Labor Economics*, 3. Cambridge, MA: Elsevier Science Publishers.
- Cronin, Julie-Ann. 1999. "U.S. Treasury Distributional Analysis Methodology," Office of Tax Analysis, OTA Paper 85, September.
- Farrell, Chris. 1996. "The Economic War Among the States: An Overview," *The Region*, vol. 9, no. 1.
- Federation of Tax Administrators. 2008. "Range of State Corporate Income Tax Rates," www.taxadmin.org/fta/rate/corp_inc.html.
- Federation of Tax Administrators. 2008. "State Apportionment of Corporate Income," http://www.taxadmin.org/fta/rate/corp_app.html www.taxadmin.org/fta/rate/corp_app.html.
- Felix, R. Alison. 2007. "Passing the Burden: Corporate Tax Incidence in Open Economies," Working Paper, Federal Reserve Bank of Kansas City, October.
- Gentry, William M. 2007. "A Review of the Evidence on the Incidence of the Corporate Income Tax," Office of Tax Analysis, OTA Paper 101, December.
- Goode, Richard. 1945. "The Corporate Income Tax and the Price Level," *The American Economic Review*, vol. 35, no. 1, pp. 40-58.
- Goolsbee, Austan and Edward L. Maydew. 2000. "Coveting thy neighbor's manufacturing: the dilemma of state income apportionment," *Journal of Public Economics*, vol. 75, pp. 125-143.

- Griliches, Zvi. 1969. "Capital-Skill Complementarity," *Review of Economics and Statistics*, vol. 51, no. 4, pp. 465-468.
- Gyourko, Joseph and Joseph Tracy. 1989. "The Importance of Local Fiscal Conditions in Analyzing Local Labor Markets." *Journal of Political Economy*, vol. 97, no. 5, pp. 1208-1231.
- Harberger, Arnold. 1962. "The Incidence of the Corporation Income Tax," *Journal of Political Economy*, vol. 70, no. 3, pp. 215-240.
- Harberger, Arnold. 1995. "The ABC's of Corporation Tax Incidence: Insights into the Open-Economy Case," *Tax Policy and Economic Growth*. Washington, D.C.: American Council for Capital Formation.
- Hassett, Kevin A. and Aparna Mathur. 2006. "Taxes and Wages," working paper #128, American Enterprise Institute for Public Policy Research, June.
- Joint Committee on Taxation. 1997. "Distributional Effects of the Conference Agreement on the Revenue Reconciliation Provisions of H.R. 2014, The 'Taxpayer Relief Act of 1997'," JCX-41-97, September.
- Kinsman, D.O. 1937. "Genesis of Wisconsin's Income Tax Law," *The Wisconsin Magazine of History*, vol. 21, no. 1, pp. 3-15.
- Kinsman, D.O. 1903. *The Income Tax in the Commonwealths of the United States*. New York: MacMillan Company.
- Maguire, Steven. 2006. "State Corporate Income Taxes: A Description and Analysis," Congressional Research Service, Report for Congress, Code RL32297, June.
- Marlow, Michael L. 2001. "A Primer on the Corporate Income Tax: Incidence, Efficiency and Equity Issues," The Tax Foundation, Background Paper 38, November.
- McLure, Charles E. 1981. "The Elusive Incidence of the Corporate Income Tax: The State Case," Working Paper No. 616, NBER, January.
- Mieszkowski, Peter and George R. Zodrow. 1985. "The Incidence of Partial State Corporate Income Tax," *National Tax Journal*, vol. 38, issue 4, pp. 489-496.
- National Bureau of Economic Research. 2006. "Internet Taxsim (v8)," <http://www.nber.org/taxsim/taxsim-calc8/index.html>.
- National Oceanic and Atmospheric Administration. 2009. "Heating and Cooling Degree Day Data," <http://www.ncdc.noaa.gov/oal/documentlibrary/hcs/hcs.html>.
- Stark, John O. 1987. "The Establishment of Wisconsin's Income Tax," *The Wisconsin Magazine of History*, vol. 71, no. 1, pp. 27-45.
- University of Michigan Ross School of Business. 2009. "World Tax Database," <http://www.bus.umich.edu/OTPR/otpr/introduction.htm>.
- U.S. Census Bureau. 2008. "State Government Tax Collections," <http://www.census.gov/govs/www/statetax.html>.
- U.S. Census Bureau. 2009. "Statistical Abstract of the United States," <http://www.census.gov/compendia/statab/>.
- Willis, Robert T. 1986. "Wage Determinants: A Survey and Reinterpretation of Human Capital Earnings Functions," in O. Ashenfelter and R. Layard, eds., *Handbook of Labor Economics*, 1. Cambridge, MA: Elsevier Science Publishers.
- Wunder, Haroldene F. 2008. "Comparing State Taxes When Making Business Decisions," *The CPA Journal*, vol. 78, no. 3, pp. 38-47.