CORPORATE TAXES AND WAGES: EVIDENCE FROM THE 50 STATES

By Robert Carroll*

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529 14th Street N.W., Suite 420
Washington, DC 20045

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* The author is Senior Fellow at the Tax Foundation and Executive-in-Residence with American University's School of Public Affairs..

I. Introduction

Who pays corporate taxes remains one of the unanswered questions in public finance. The rationales for corporate income taxes include adding progressivity to the tax system and providing a backstop to the income tax. The former is premised on the notion that corporate income taxes are borne by owners of capital. The later presumes that without the corporate income tax, taxpayers may escape personal income taxes on capital.

Recent empirical research, however, has questioned whether corporate income taxes are indeed borne by owners of capital. This research draws on the substantial reductions in corporate tax rates internationally over the past several decades to estimate whether wages rates have risen the most in countries with the largest reductions in corporate tax rates. This research has found a substantial negative relationship between corporate tax rates and real wages with one study finding that a 1 percentage point reduction in corporate tax rates leads to a 0.8 percent increase in real manufacturing wages (Hassett and Mathur, 2006).

The intuition behind the research focusing on international changes in corporate taxes rests with one of the tenets of tax incidence: a tax will generally be borne by the least mobile factor. In an increasingly global economy, where capital flows freely across borders, but labor does not, the corporate income tax can be expected to be borne primarily by labor. Countries that are able to attract investment experience greater capital

formation. Providing workers with more capital to work with increases their labor productivity, and, ultimately, their real wages.

This paper looks to the experience within the United States, rather than internationally, to empirically investigate this issue. In the aggregate, state and local corporate taxes as a share of state and local revenues has remained relatively constant at roughly 5 percent over the past several decades. In contrast, reliance on the corporate tax at the federal level has declined with corporate taxes comprising about 10 percent of total federal revenues as compared to 20 percent several decades ago.

Some states have increased their reliance on corporate taxes, while others have reduced their reliance. Moreover, the average state corporate tax rate has risen from 2.6 percent several decades ago to 4.4 percent today. This provides the exogenous variation in taxes needed to determine whether those states with the largest reductions in corporate tax rates have also had the largest gains in real wages. Using state level data also provides a stronger test of whether higher corporate taxes are borne by labor because labor is likely to be more mobile across the 50 states than internationally. Thus, a finding from this paper that is similar to the international experience would lend considerable support to the notion that corporate taxes are borne by labor rather than owners of capital.

The empirical strategy is to pool cross-sectional state level data from 1970 through 2007 to directly examine whether states with lower corporate taxes have tended to exhibit higher real wages. The empirical model also includes other factors that might influence wages rates, such as the degree of unionization, whether a state has a right to work law, and demographic features of the population. The model controls for both state and time effects to control for otherwise unobserved variables.

To anticipate the results, the paper generally finds a statistically significant, negative relationship between corporate taxes and the real hourly average earnings for production workers. A 1 percent increase in the average state and local corporate tax rate can be expected to lower workers' real wages by 0.014 percent. This implies that for every one dollar increase in state and local corporate tax revenues, wages can be expected to fall by roughly 2.5 dollars. This result is robust to a broad range of model specifications, considerably smaller than some of the research based on the international experience, but roughly twice as large as the theoretically-based results reported by Harberger (2006). The paper also considers whether wage rates are sensitive to the corporate tax rate, although this relationship is not as robust across different model specifications.

The next section of the paper summarizes the recent research examining the relationship between taxes and wages. Section III of the paper describes a simple conceptual model. Section IV outlines the empirical model and data. The results are presented in Section V and Section VI concludes the report.

II. The Literature

Much of the prevailing view of the incidence of the corporate tax rests with Harberger (1962), which concluded that the corporate tax is likely borne by all capital, rather than just owners of corporate capital. This conclusion, in part, results from the assumption that capital is fixed in supply. If the supply of capital is free to vary, perhaps due to changes in the capital stock over time or because capital is mobile between countries (but labor is not), the incidence of the tax can be very different. Indeed, an increase in the corporate tax can lead to a decrease in the supply of capital, where, in the

open economy context, there is an outflow from the home jurisdiction. The after-tax return falls abroad and rises in the home jurisdiction as capital flows abroad from the home jurisdiction (Kotlikoff and Summers, 1987). But, if the home jurisdiction is small the effect of on the after-tax return abroad will be close to zero. In this case, labor in the home jurisdiction bears the full burden of the tax.

Importantly, given that the exodus of capital from the higher tax generates a deadweight loss, the burden of the tax can exceed the revenue generated (Gordon, 1986). Harberger (2006) revisited the incidence of the corporate tax in an open economy framework and found that the burden of the tax more than fully shifts to labor. He estimated that the burden on labor might be 130 percent of corporate revenue.

The notion that at least some portion of the corporate tax is shifted to labor is not controversial. For example, even though a 1996 study by the Congressional Budget Office (1996) suggested that the corporate tax was likely borne primarily by owners of capital, it acknowledged that some of the tax was likely borne by labor. In a 1998 survey of public finance economists asking what percent of the corporate tax falls on labor and what percent falls on capital, the responses varied greatly, but the median response was that 60 percent is borne by labor with the remaining 40 percent borne by capital. There remains considerable uncertainty about how much of the tax is borne by labor and the mechanisms at play that lead to such shifting.

In a recent review, Auerbach (2005) discusses the roles played by a variety of factors, such as risk, imperfect competition, corporate financial policy, international capital flows and managerial incentives. A series of recent empirical studies have focused on the open economy aspects of the issue and uses the changes in corporate tax rates

abroad over the past several decades to consider the relationship between wages and corporate taxes.[1] While each study used a different approach, each finds that labor bears a substantial portion of the corporate tax.

Arulampalam, Devereux, and Maffini (2008) consider the extent by which the corporate tax might be borne by labor in a bargaining framework between firms and workers over the firms economic rents. The traditional mechanism by which the corporate tax might be borne by labor is by changes in the capital intensity of a firm. By inducing changes in the use of capital, the corporate tax influences labor productivity and real wages. Arulampalam et al (2008) consider that firms may earn economic rents and workers and firms engage in bargaining over these rents. The corporate tax can play a role in this bargaining process. Where firms operate under imperfect competition, the firm and labor bargain over the proportion of economic rents that are paid out as wages. The corporate tax, in effect, reduces the economic rents that can be paid out as wages under the bargaining process. The empirical strategy employed by the study is to consider whether the corporate tax affects wages rates while controlling for labor productivity.

Arulampalam et al (2008) use data on 55,082 firms in nine countries from 1996 through 2003. The dependent variable is per worker employee compensation. The corporate tax is measured as the log of firm-level corporate tax liability per worker. This measure of corporate taxes does not rely on changes in the statutory tax rate alone, but rather captures all changes in the corporate tax structure. Differences in tax liability can result from differences in investment patterns, source of finance, the pattern of income and deduction across business units, and the timing of losses. They also include lagged compensation, value-added per worker, and year fixed effects. Value-added per worker

[1] A survey of this literature is provided by Gentry (2007).

controls for changes in capital intensity and worker productivity. This paper addresses the endogeneity of the tax variable by including lagged values of a number of alternative tax measures (e.g., statutory tax rates, effective marginal tax rates, and average tax rates) leaving four years of data for estimation. Arulampalam et al (2008) find a negative and statistically significant relationship of corporate taxes on wages with a $1 increase in corporate taxes reducing real wages by 92 cents in the long-run. Thus, nearly the whole of an additional dollar in taxes is passed on to workers in the form of lower wages. This result is robust across a number of different specifications and robustness checks.

Hassett and Mathur (2006) estimated the relationship between wages and corporate tax rates using a sample of 72 countries from 1981 through 2002. They focus on the effect of the statutory corporate tax rate on manufacturing wages, but also consider effective marginal tax rates and average tax rates, and the role of individual tax rates. Their study included a large number of countries during a period of large declines in corporate tax rates. Similar to Arulampalam et al (2008), Hassett and Mathur (2006) also include a proxy for labor productivity, value-added per manufacturing worker. Changes in capital intensity induced by the corporate tax should flow through to their measure of labor productivity. That is, Hassett and Mathur's corporate tax variables appear to abstract from or hold constant the effects of labor productivity arising from changes in capital intensity.

Hassett and Mathur (2006) also report large effects: for every 1 percent increase in corporate tax rates, wages decrease by nearly 1 percent. The study also focused on the spatial dimensions of international tax competition and found a correlation between high-tax neighbors and high domestic wages suggesting that nations are able to attract

investment by lowering their tax rates relative to their neighbors. Finally, this paper finds that the responsiveness of wages to corporate taxes is greater in small countries.

Felix (2007) uses aggregated data on wages differentiated by skill level from 19 developed countries over the 1979 to 2000 period from the cross-country Luxembourg Income Study. The empirical model controls for openness of the economy as measured by total trade divided by gross domestic product. The model also uses alternative measures of the tax rate and finds that corporations are better able to lower their average tax rates in more open economies.

This study also finds large and significant effects of the corporate income tax on wages: a ten percentage point increase in the corporate tax rate is found to reduce annual gross wages by 7 percent. These estimates suggest that labor's burden of the corporate tax is four times the magnitude of the corporate tax revenue collected in the United States. Felix also finds that the burden of the corporate tax does not vary by skill level. Felix estimates the Hassett and Mathur (2006) specification, including value-added per worker, using their data, but estimate an effect that is roughly one-half smaller.[2]

Gravelle and Hungerford (2007) have questioned the estimates of both Hassett and Mathur (2006) and Felix (2007) as being implausibly large. They report that the Hassett and Mathur (2006) estimates indicated that for every one dollar increase in corporate taxes, wages would fall by $22 to $26 dollars, an effect that no model could predict.[3] Harberger (1995, 2006) shows, based on a theoretical model, that labor can bear more than the full burden of the corporate tax in an open economy. The intuition behind

[2] Similar to Arulampalam et al (2008), Felix (2008) also notes that the inclusion of the value-added per worker variable conflagrates the interpretation of the tax variable because it changes in capital intensity and labor productivity are one of the channels through which the corporate tax is expected to influence wages.
[3] Jane Gravelle and Thomas Hungerford, "Corporate Tax Reform: Issues for Congress." Congressional Research Service, Report for Congress, July 24, 2008, p19.

this result is that the wages in a sector subject to the corporate tax must fall because the price of capital is set internationally; that is, the after-tax return to capital will be unaffected by the change in the domestic corporate tax. Moreover, the price of the good produced by the taxed sector, if tradable, will also be set internationally. Thus, the only channel for the tax to be absorbed is through the price of labor. The fall in wages, however, will apply to both the taxed sector and the untaxed sector. Thus, as a first approximation, labor may well bear more than the full burden of the tax, but at levels well below those predicted by Hassett and Mathur (2006).

Desai, Foley and Hines (2007), use data aggregated from a panel of U.S. multinational corporations operating in 50 countries between 1989 through 2004 to estimate jointly the impact of the corporate income tax on the wage rate and the rate of profit.[4] In their baseline specification, they report that 57 percent of the corporate tax is borne by labor, but generally find that between 45 and 75 percent of the corporate income tax is borne by labor across a range of specifications.

Finally, a recent paper by Felix (2009) has focused on the experience within the 50 states. This study uses individual level data from the Current Population Survey from 1977 through 2005. The empirical specification relates an individual's wages to corporate taxes, the individual's characteristics, and state characteristics. Aggregated data might be more suitable for analyzing tax incidence because the objective is to measure the general equilibrium effect of taxes on all wages. Also, it appears that the study only uses the state corporate tax rate, rather than the combined federal-state corporate tax rate and excludes local corporate income taxes. Nevertheless, Felix (2009) finds a negative relationship between wages and corporate taxes with wages falling between 0.22 and 0.67 percent for

[4] Data from four cross-sections in 1989, 1994, 1999 and 2004 are used for estimation.

a 1 percentage point decline in the state corporate tax rate translating into a 0.14 to 0.36 percent decline in wages.

This paper draws on this research to estimate whether differences in corporate income taxes can explain differences in wage rates. Similar to Felix (2009), this study considers the experience across the 50 states, but uses aggregated data at the state level which reflects the full general equilibrium effects of taxes on wages. Focusing on this issue at the state level has several advantages. First, while capital is likely to be highly mobile across the states just as it is internationally, labor is likely to be more mobile across the states than internationally. Obtaining a strong relationship between taxes and wages at the state level would serve to reinforce the recent evidence based on the international experience. Second, the states can generally be viewed as small open economies when viewed form the perspective of global capital markets. Accordingly, state corporate tax policy should have little effect on the world after-tax return to capital. Finally, consistently measured state level data is readily available over a lengthy period of time allowing the experience of the states over the past several decades to be captured.

III. Empirical Model

This paper follows the simple conceptual framework used by Hassett and Mathur (2006) to estimate the relationship between wages and corporate taxes. The empirical model is given by the wage equation:

$$w = \partial Y/\partial L = (1-\alpha)\, A^{1-\alpha}\, (K/L)^{\alpha} = (1-\alpha)\, A^{1-\alpha}\, (k)^{\alpha}$$

where w is the wage rate, Y is output, A is technology, K denotes capital, L denotes labor, and *k* denotes the capital stock per worker. The greater capital per worker (k), the higher the wage rate. Lower taxes on capital, possibly through lower corporate taxes,

increases the capital stock. A larger capital stock means more capital per worker and, ultimately, higher wages rates.

The framework presumes that capital taxes influence investment and capital formation. There are numerous studies that tie investment to corporate tax rates both domestically and internationally.[5] As noted by Arulampalam et al (2008), the inclusion of capital intensity in the specification (i.e., *k*), may alter the interpretation of the tax variable because the channel of corporate taxes influencing wages through changes in capital intensity and worker productivity is held constant. Similar to Hassett and Mathur (2006), this paper includes the lagged value of output per worker, which leaves open the possibility for corporate taxes to influence wages through worker productivity. Increases in wages are likely associated with rises in productivity that might arise for reasons other than changes in corporate taxation, such as technology and innovation. Nevertheless, the identification of the tax variable may be affected by the inclusion of the productivity variable, particularly if the lag length is not sufficiently long. Accordingly, estimates with and without the productivity variable are reported to show the sensitivity of the results.

Another consideration is just how long it takes for the capital stock to adjust to changes in its taxation and to effectuate a change in the marginal product of labor. Hines (2007) suggests, for example, that low tax countries have been particularly successful at attracting additional investment through lower corporate tax rates. Indeed, examining the growth of low-tax rate countries over the past several decades, Hines (2007) found that countries with low tax rates grew 2.5 times faster — 3.3 percent annually for low tax rate

[5] For example, see the review by Hassett and Hubbard (2002).

countries as compared to 1.4 percent for the world economy — from 1982 to 1999.[6] This paper follows Hassett and Mathur (2006) and uses a five year lag in the base specification, but also reports results with other lag structures.[7]

Two different measures of the corporate tax rates are used: 1) the statutory corporate tax rate, and 2) the average tax rate. The statutory corporate tax rate is likely relevant not only to investment levels, but also the location of income. In the international context, Brill and Hassett (2007) show that internationally the size of the tax base is sensitive to differences in corporate tax rates. The same can be expected at the state level, but the formulas used to apportion multistate income to a state figure prominently.

The states generally use some variant of a three-factor apportionment formula – payroll, property and sales – to allocate income generated by a company operating in more than one state to a particular state. With a three factor formula, a company allocates its total income in proportion to its share of payroll, property and sales within a state. Instead of a three factor formula, some states double weight the sales factor or employ a "sales-only" formula. Thus, the sensitivity of the tax base to state tax rates depends on the ability of companies to affect the proportionate among of payroll, property and sales within a state.

As suggested by McClure (1980) and Gordon and Wilson (1986), the apportionment formula may have the effect of transforming the state corporate income tax into three separate taxes imposed on payroll, property, and sales. From this vantage point, the payroll component of the tax might well be viewed as a wage tax, the property

[6] James R. Hines, "Do Tax Havens Flourish," Tax Policy and the Economy, Vol. 19 (Cambridge, MA: MIT Press, 2005), p. 66.

[7] Gravelle and Hungerford (2008) find that the results reported by Hassett and Mathur (2006) are sensitive to lag structure.

component as property tax, and the sales component as a sales tax. Of course, this would alter the view of the incidence of the tax, because only the property component could properly be viewed as a tax on capital. Of course, the apportionment formulas are only relevant for multi-state income.

IV. Data

The empirical model employs state level data from 1970 through 2007. Descriptive statistics for the major variables used for estimation are provided in Table 1. The dependent variable is the log of the real average hourly earnings for production workers as published in the series *Employment and Earnings* by the Bureau of Labor Statistics. One advantage of using average hourly earning rather than, for example, a measure of the wage bill is that hourly earnings abstracts from changes in employment levels. This variable is converted to 2007 dollars using the consumer price index (CPI-U). The trend for this variable, as shown in Figure 1, is both a modest downward trend and substantially less dispersion beginning in the mid-1980s.

The independent variables are all measured at the beginning of period values and include a corporate tax variable, a measure of worker productivity, and other factors that influence the labor market. Worker productivity is measured as the log of value added per worker (measured as gross state product divided by total employment). The fraction of the population 25 or over with at least a four year college degree, COLLEGE, is included as a proxy for the human capital or skill level of workers. Those states with a more skilled work force would, of course, be expected to have higher wages rates. Other labor market variables that might affect wages rates are also included such as the fraction of the work force that is unionized, UNION, and a dummy variable indicating whether a state

has a right to work law, RTWL. States with declining unionization would be expected to have lower wages. States with right to work laws would also be expected to have lower wages. Finally, the fraction of the population that is working age and population density are also included. Otherwise unobserved state and time effects are modeled as fixed parameters by including state and time dummy variables.

The model is estimated with two different measures of the corporate tax rate: 1) the maximum combined state-federal corporate tax rate, and 2) the average state corporate tax rate, measured as state and local corporate tax collections divided by personal income.[8] The statutory corporate tax rate is constructed to account for federal and state deductibility as appropriate.

Figure 2 shows that the reliance on corporate taxes as a source for state and local revenues has varied considerably over the past several decades ranging from as low as 1.7 percent in 2002 and a high of 3.5 percent in 1980. Of the 46 states and the District of Columbia with at least some type of corporate income tax in 2007, Alaska relied most heavily on corporate tax revenues (7.5 percent) and Missouri relied the least (1 percent). As can be seen from Figure 2, corporate revenues are particularly sensitive to the business cycle, but the overall trend over this period also reflects increasing tax competition.

This Figure 3 shows the trend for the maximum state corporate tax rate over the 1970 through 2007 period. The average state corporate statutory tax rate increased by nearly 30 percent over this period, rising from 5.2 percent in 1970 to 6.7 percent in 2007. As shown in Figure 4, the combined federal-state tax rate, however, fell primarily from

[8] A small number of states have no corporate income tax. For these states, the natural logarithm of the tax rate is calculated after adding 0.001.

the reduction in the federal corporate tax rate from 46 percent to 34 percent under the Tax Reform Act of 1986. The impact of the change in the federal rate, however, will tend to be absorbed by the time effects.[9]

The average corporate tax rate captures the effect of both the statutory corporate tax rate and differences in the definition of the tax base, including the state apportionment formula, across the states.[10] Constructing this variable by relating corporate revenues to a measure of corporate profits would have been preferable, but a measure of corporate profits is not available at the state level. This variable could have been constructed by relating corporate revenues to gross state product, but this variable is already used to construct the labor productive variable.[11]

The average tax rate also rose during this period, but not nearly as much – from 3.45 percent in 1970 to 5.12 percent in 2007 – suggesting that, on average, a narrowing of the tax base may well have offset to some extent the increases in the state statutory corporate tax rates.

The simple correlation between state corporate tax rates and real wages is shown in Figure 5. While this figure depicts the expected negative relationship between corporate tax rates and is suggestive, it does not control for other factors described above that might also determine wages. Also, this figure only shows state and local corporate taxes. The large decrease in the federal corporate tax rate in 1986, while confounding this simple relationship, should generally be captured in the empirical model through the time effects.

[9] The federal tax rates will, however, affect the value of deducting state corporate taxes.
[10] Some international studies, such as xxx, have used measures of the effective marginal tax rate, as derived from the cost of capital. Such a measure was not feasible for this time period and across the fifty states.
[11] The sensitivity of the results to this alternative definition is considered below.

V. Results

The results for the base specification are provided in Table 2. Real wages are found to rise with worker productivity and educational attainment. The real hourly earnings of production workers also are found to be higher in states that are more highly unionized and lower in states with right-to-work laws. Finally, wages are found to rise with the fraction of the resident population that is working age and with population density.

The results for the corporate tax variable indicated that real wages are negatively related to corporate taxes: As corporate taxes rise, real wages fall. The coefficient for the combined federal-state corporate tax rate is negative, but only statistically significant at a 90 percent confidence interval, suggesting an imprecise estimate. The coefficient for the average tax rate is negative and statistically significant. A 1 percent increase in the average tax rate of a state can be expected to result in a decline in workers' real wages of 0.014 percent.

To gauge what this result implies for the incidence of the corporate income tax, I calculate how much wages are predicted to decline for a $1 increase in corporate tax collections. In 2002, state and local corporate tax collections were $28.2 billion. Thus, a 1 percent increase in the average tax rate would translate into an additional $282 million in state and local corporate tax collections. The estimated elasticity implies that such an increase in corporate tax collections would have lowered the average hourly earnings by 0.014 percent. Annualizing this change over a 2,000 hour work year means annual wages would have risen by about $5 per worker. Aggregating over the 145 millions workers in the U.S. economy, this translates into a reduction of about $715 million in wages. This

implies that wages can be expected to fall by about $2.5 for every dollar in additional revenue.[12] This result is substantially smaller than the results implied by Hassett and Mathur (2006) and Felix (2007), and roughly twice the magnitude from Harberger's (2006) theoretically-based calculations.

Sensitivity and Robustness of Results

Estimates for the tax variables are reported in Table 3 for several alternative specifications to consider the sensitivity of the results. One concern is that the results might be sensitive to the lag structure in the base specification. The model is reestimated with both a three and one year lag structure. Gravelle and Hungerford (2007) found that the results of Hassett and Mathur (2006) were particularly sensitive to the lag structure of the model and whether the dependent variable was defined as average wages over the preceding five years or annual wages. The results reported in Table 3 indicate that the results for this paper are not sensitive to the lag length.

The model was also reestimated using average wages as the dependent variable rather than annual wages. Hassett and Mathur (2006) suggest that this specification addresses the effects the business cycle might have on the dependent variable, although averaging also eliminate some of the variation in wages. The results reported in Table 3 indicate that the results for the average tax rate are unchanged, but the coefficient for the statutory tax rate is no longer statistically significant.

Both Arulampalam et al (2008) and Felix (2007) raise some concerns about including the productivity variable. As discussed above, the concern is that the effect of

[12] Note that corporate tax collections in 2002 were depressed due to the lingering effects of the recession and the federal bonus depreciation provision to which many states coupled. Computing the effects in a more recent year would result in a somewhat smaller proportional increase in wages relative to corporate tax collections.

the corporate tax on wages through changes in capital intensity cannot be separately estimated because they will, in part, be absorbed by the labor productivity variable. The base specification used for this paper, nevertheless includes this variable because labor productivity is likely one of the primary determinants of wages not only through the effects of corporate tax policy, but the technology and innovation. Dropping this variable from the model has only minor effects on the results.

A specification is also estimated using an alternative definition of the average tax rate, state and local corporate tax collections as a fraction of gross state product rather than personal income.[13] As discussed above, a preferred measure would be to relate corporate collections to a measure of corporate profits, but a measure of corporate profits is not available at the state level. Personal income was used to construct the average tax rate, in part, because gross state product is already used to construct the labor productivity variable. Regardless, as reported in Table 3, the results are virtually unchanged when gross state product rather than personal income is used to construct the average tax rate.

The final robustness check considers a broader definition of average wages – total wages divided by total employment as estimated by the Bureau of Economic Analysis. This variable considers wage movements for all workers, not just production workers. However, the variable varies not only with wages, but also with employment levels, which confounds its interpretation somewhat. The results for the average corporate tax

[13] Once concern with the specification might also be that personal income or gross state product might independently influence wage rates. It is possible that the negative coefficient for the average tax rate could well be a reflection of this relationship. In specifications not reported in Table 3, the inverse of real personal income and real gross state product were included and the average tax rate dropped. The coefficients for neither of these variables were statistically different from zero suggesting that the negative coefficient for the average tax rate is not a reflection of the independent influence of personal income or gross state product on wage rates.

rate are similar to the specification using the average wage for production workers (coef. =0.013 and statistically significant), but the coefficient for the statutory tax rate is not statistically different form zero.

VI. Conclusion

The incidence of the corporate income tax remains one of the elusive and unanswered questions in public economics. The decline in corporate tax rates abroad has allowed researchers to use this international experience to consider whether those countries with the largest declines in corporate tax rates also had the largest gains in workers' wages. This emerging literature tends to find that labor bears a substantial portion of the corporate income tax.

This paper considers the experience within the United States over the past several decades to consider the same question. Theory generally suggests that a tax will be borne by the least mobile factor. Internationally, capital is likely highly mobile, while labor is not. Within the 50 states, capital remains highly mobile, but labor can be expected to be more mobile than internationally. Accordingly, similar results for the 50 states would lend additional support to the research focusing on the international experience.

The paper finds that corporate taxes negatively affected wages during the 1970 through 2007 period. The paper estimates that a 1 percent increase in the average state and local corporate tax rate can be expected to lower real wages by 0.014 percent. This result is robust to a broad range of model specifications. The paper also considers whether wage rates are sensitive to the corporate tax rate, although this relationship is not as robust across different model specifications.

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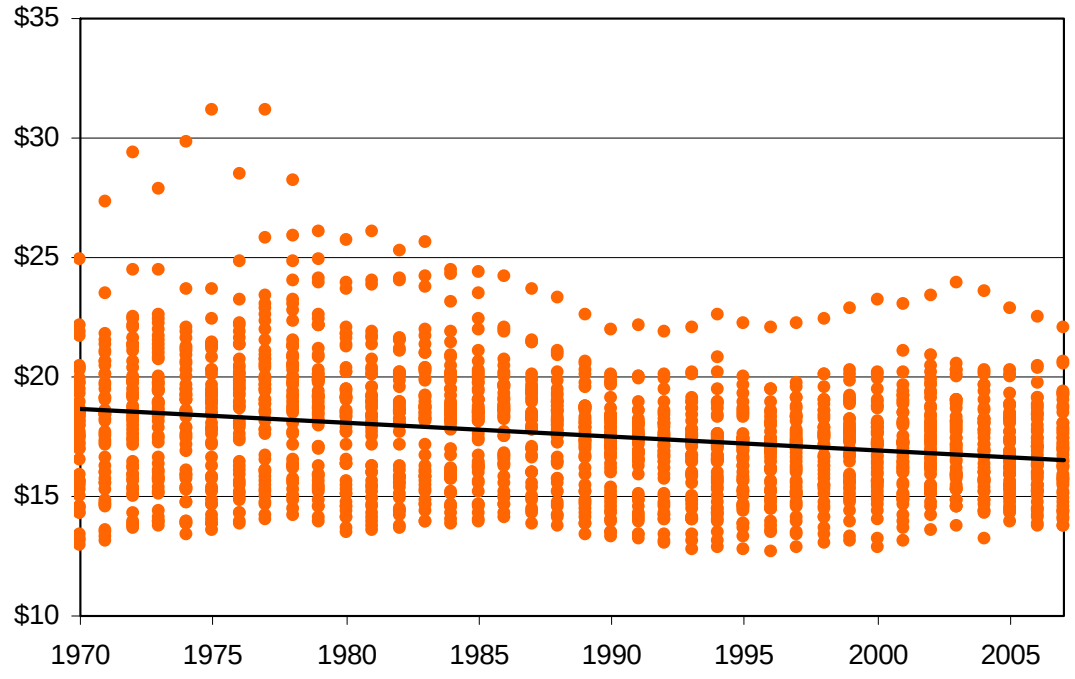
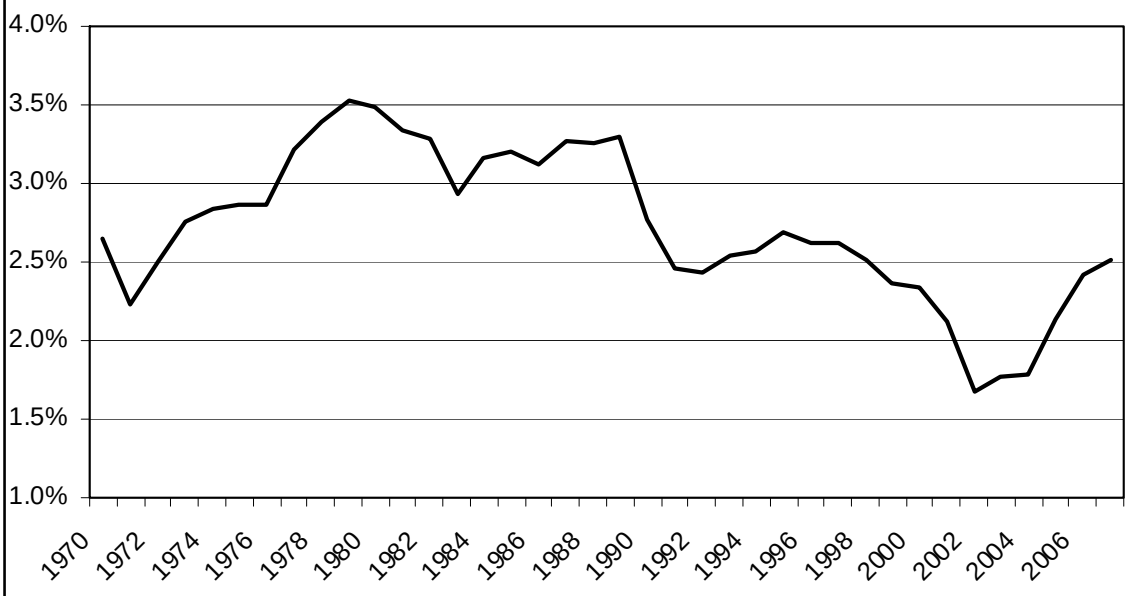
Figure 1: Distribution of Real Average Hourly Earnings for Production Workers by State, 1970 to 2007



Source: U.S. Department of Labor, Bureau of Labor Statistics.

Figure 2: State and Local Corporate Tax Revenues as a % of Total Revenues



Source: U.S. Department of Commerce, Bureau of the Census.

Figure 3: Maximum State Corporate Tax Rate, 1970-2007

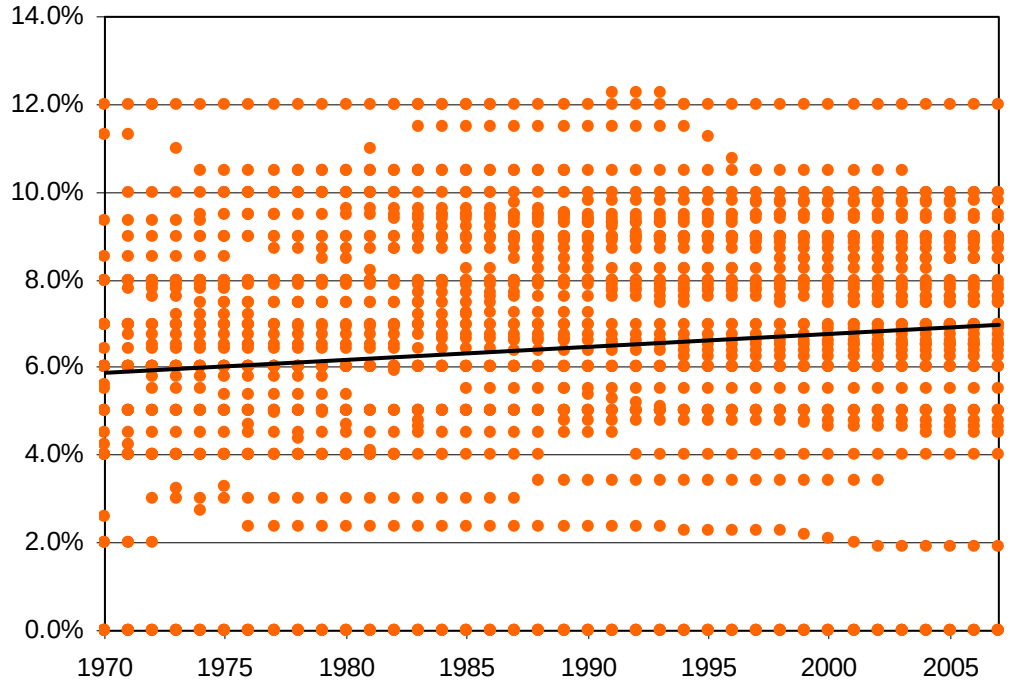


Figure 4: Combined Federal-State Corporate Tax Rate, 1970-2007

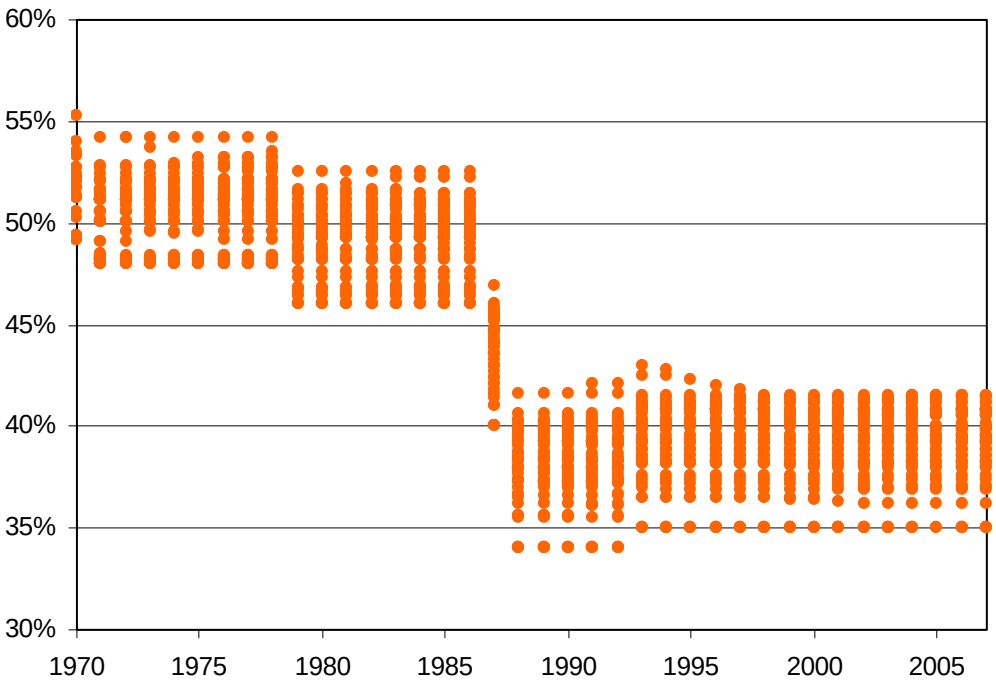


Figure 5: Relationship of Real Hourly Earnings for Production Workers and the Top Statutory State and Local Corporate Tax Rate

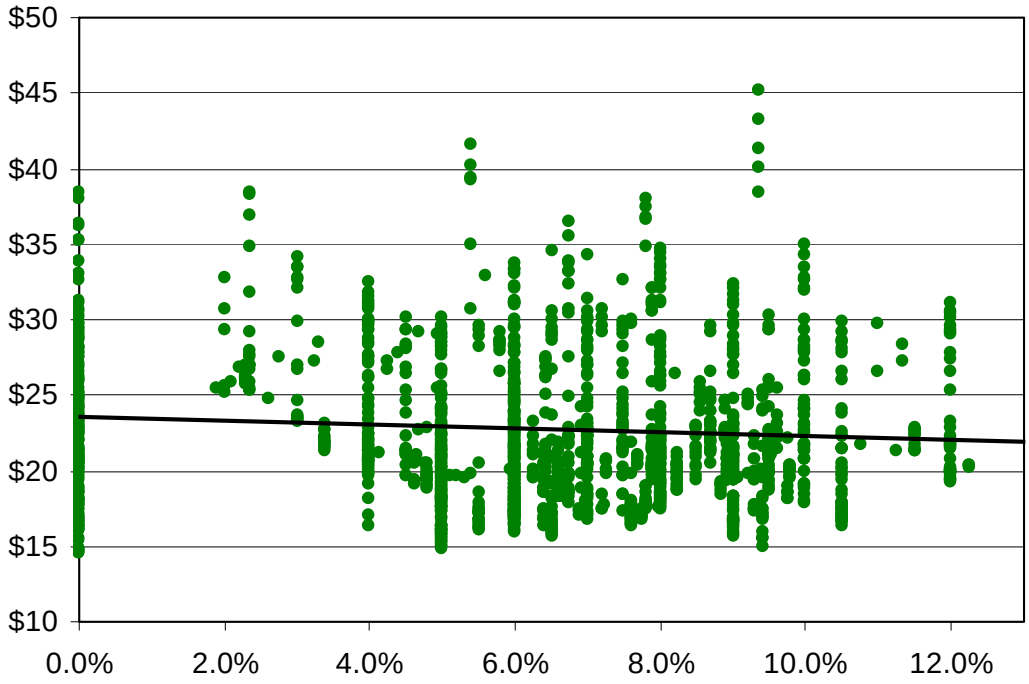


Table 1: Descriptive Statistics		
Variable	**Mean**	**Standard Deviation**
Real Average Hourly Earnings of Production Workers	22.3	4.72
Statutory Tax Rate	44.6	5.81
Average Tax Rate	4.57	5.47
Real GSP per Worker	81,130	16,065
% College	18.5	5.79
% Union	17.3	8.2
RTWL Dummy Variable	0.387	0.487
% of Population Working Age	60.1	3.32
Population Density	365.1	1,450.5

N=1,683 observations.
Note: The descriptive statistics are calculated from 1975 through 2007 for average hourly earnings of production workers and from 1970 through 2002 for the remaining variables.

Table 2: Results for Base Specification		
Dependent Variable: Log(Real Average Hourly Earnings for Production Workers)		
Variable	**(1)**	**(2)**
Intercept	-0.585* (0.251)	-0.322 (0.245)
Log(Statutory Tax Rate)	-0.138** (0.083)	
Log(Average Tax Rate)		-0.014* (0.003)
Log(Real GSP per Worker)	0.201* (0.019)	0.209* (0.019)
% College	0.360* (0.125)	0.286* (0.125)
% Union	0.406* (0.056)	0.371* (0.057)
RTWL Dummy Variable	-0.040* (0.012)	-0.039* (0.012)
% Working Age	0.158* (0.067)	0.155* (0.067)
Population Density	0.000089* (0.000011)	0.000061* (0.000013)

*Statistically significant at the 95 percent level of confidence.
**Statistically significant at the 90 percent level of confidence.
Note: All specifications include state and time dummy variables to model state and time effects as fixed parameters. Base specification uses a five year lag structure.

Table 3: Sensitivity of Results to Alternative Specifications		
Dependent Variable: Log(Real Average Hourly Earnings for Production Workers)		
Variable	**Log (Statutory Tax Rate)**	**Log (Average Tax Rate)**
Base Specification	-0.138** (0.083)	-0.014* (0.003)
Alternative Specifications: Sensitivity of Results		
3 Year Lag	-0.134** (0.079)	-0.015* (0.003)
1 Year Lag	-0.165* (0.076)	-0.016* (0.003)
Dependent Variable: Real wages averaged over five years	-0.112 (0.075)	-0.015* (0.003)
Drop Log(GSP per Worker)	-0.172* (0.085)	-0.011* (0.003)
Define Average Tax Rate as % of GSP rather than personal income	NA	-0.014* (0.004)
Dependent Variable: Real average wages for all wage and salary employees[1]	-0.013* (0.002)	-0.028 (0.062)

*Statistically significant at the 95 percent level of confidence.
**Statistically significant at the 90 percent level of confidence.
[1] This average wage variable is for all employees, not just production workers and is computed from the wage and employment series produced by the Bureau of Economic Analysis.

Note: All specifications include state and time dummy variables to model state and time effects as fixed parameters. Specification uses a five year lag structure unless indicated otherwise.