STATE CORPORATE INCOME TAX INCIDENCE: THE RELATIONSHIP BETWEEN TAX RATES AND LABOR WAGES

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ABSTRACT

A well-developed literature exists on the general issue of corporate tax incidence, but many of those studies involve national or federal tax rates. Fewer articles are written with a focus on wages and corporate tax rates at the subnational level. While most of the literature tends to agree that there is a negative relationship between corporate tax rates and wage, those that deal with the state, provincial or local levels consistently vary in terms of the relationship's magnitude. This study extends the research on the relationship between U.S. state corporate tax rates and labor wages into the decade beyond the Great Recession. It also registers another data point in the ongoing attempt to pin down the size of the corporate tax to wage relationship. This paper is organized into four sections. It begins with an overview of past literature on the incidence of subnational corporate taxation and the relationship between subnational corporate tax rates and wages. The study then uses a multivariate ordinary least squares regression model to examine real wage data from the U.S. Census Bureau's American Community Survey coupled with tax data collected by the Tax Policy Center. The third section unpacks the results of the study which suggest a negative relationship between U.S. states' corporate income tax rates and real annual wages. The final section offers several policy implications that may follow from the negative state corporate tax to labor wage relationship.

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INTRODUCTION

Historically, tariffs were the main source of revenue for the U.S. government (Domitrovic, 2018). The corporate income tax was first enacted at the federal level in 1909 as an excise tax (Internal Revenue Service [IRS], 2003). Upon the ratification of the 16th Amendment in 1913, the Federal Government was granted authority to levy income taxes. Under that new power, the federal income tax began to supplant tariffs as the largest component of revenue. The federal tax on corporate income also became a permanent component of the income tax code (Office of Management and Budget [OMB], 2020). Over the years, the share of revenue generated by corporate income taxes has declined. The share of federal revenue attributable to the corporate income tax peaked in the 1950s at 28 percent (J. Friedman, 2003). In 2019, corporate taxes comprised only seven percent of total federal revenues (Center on Budget and Policy Priorities [CBPP], 2020).

At the subnational level, individual states began adopting corporate income taxes soon after the Federal Government began its practice. In 1911, Wisconsin was the first state to pass such a law (Emanuel & Borean, 2014). As of 2020 only South Dakota and Wyoming have no corporate income tax or gross receipts tax (Tax Policy Center [TPC], 2020). State corporate taxes generate a relatively small share of state government revenue. Size of the revenue share varies by jurisdiction. New Hampshire, for example, has the greatest share of income generated by corporate taxes: 13 percent. On the opposite end of the spectrum are states like New Mexico,

North Dakota, Oklahoma, and South Dakota with only one percent of revenue attributable to corporate taxes (TPC, 2020).

Although state corporate tax rates make up a relatively small share of any state's revenue, it nevertheless remains a noteworthy portion of revenue for most states. As of July 2020, combined state and local debt across the United States was $3.1 trillion (Board of Governors of the Federal Reserve System (US), 2020). For states like Illinois, which has $140 billion in unfunded liabilities, every dollar counts. Corporate tax revenue accounting for five percent of the state's $40.1 billion budget is not immaterial (Schuster, 2020; TPC, 2020; Office of the Governor, 2019).

Corporate income taxes are popular with politicians and voters alike. They allow states to generate an important amount of revenue without having to increase individual income tax or property tax rates. By imposing taxes on corporations, politicians may reason they can insulate themselves from backlash that may otherwise come from individuals subject to personal income tax hikes. Likewise, many self-interested voters will naturally prefer taxes on capital holders if it means foregoing tax hikes on themselves. For many it is also a matter of fairness as labor's share of income has fallen since the turn of the 21st century and income inequality appears to be increasing within the United States (Stone et al., 2020; Feenstra et al., 2015; University of Groningen and University of California, Davis [UC Davis], 2020).

Milton Friedman (1975) once said, "[o]ne of the greatest mistakes is to judge policies and programs by their intentions rather than their results." There is perhaps no more salient

application of that observation than to tax policy. This paper examines the relationship between state corporate tax rates and wages to better understand whether the intent of the corporate tax rate is meted out by its results.

Sometimes a tax precisely hits its intended target. Consider the individual income tax. The intent is to generate revenue from individuals' annual incomes. The accomplishment of that intent is clearly realized every April 15.

On other occasions, the intended target may be overshot. The payroll tax is an example. Half the tax is remitted by the employer. Half the tax is remitted by the employee. Unfortunately for the worker, the full effect of the payroll tax does not conform to its design. Since resources have alternative uses, the employer's half of the tax payment could have been used to increase the employee's wage. Instead, that money went to the government. The foregone wage increase means the worker effectively bears the full burden of the payroll tax. Unfortunately, there are other revenue policies where discerning the true tax incidence is harder still. Corporate taxes are one of those policies.

At first glance, it is tempting to think that the incidence of corporate taxation falls on the owners of corporations. After all, the laws of nearly every state compel corporations to remit tax payments to their respective revenue services. It is a fundamental misunderstanding of taxation, however, to believe that whichever party the law directs to pay a tax is the party that actually bears its burden. In reality, tax incidence is determined partly by a party's willingness to absorb increased costs and partly by the availability of substitutes. Consumers determine a

measure of tax incidence for goods by their willingness to pay more or purchase an alternative product. The same is true for production. Producers determine a level of tax incidence through their willingness to absorb increased costs or substitute factors of production. What is more, corporations are not abstract beings. Corporations are made up of people, and these people control the factors of production, capital and labor. We know people pay corporate taxes, but the question is: which people bear the burden?

LITERATURE REVIEW

A well-developed literature exists on the general issue of corporate tax incidence, but many of those studies involve national or federal tax rates. Fewer articles are written with a focus on wages and corporate tax rates at the subnational level. Many of the scholars who have investigated the intersection of those narrower topics come to the similar conclusion: there is a negative relationship between state (or provincial) corporate tax rates and wages for labor. That said, the exact magnitude of the relationship has been difficult to pin down. Of course, not everyone agrees that the negative relationship exists. One, if not more, prominent scholars question the validity of the relationship entirely. Still, the weight of the literature suggests the relationship exists and that it matters for reasons of progressivity and efficiency.

In 2018, Fuest et al. study the incidence of the local business tax (LBT) in Germany using panel data and administrative data collected from 3,522 municipalities between the years 1993 and 2012. Municipalities in Germany have the autonomy to adjust their own LBT rates. This afforded the authors the opportunity to treat municipalities as small, open economies. By definition, open economies allow factors of production to be highly mobile. In the long run of an

economy, as forces of supply and demand interact and factors of production move about an all-encompassing, or general, market equilibrium will occur. One critic of the negative corporate tax to wage relationship, Kimberly Clausing (2011, 2013), points out that the complexity of an economy of this sort makes accurate empirical study difficult. Fuest et al. (2018) counter by pointing out that the "general equilibrium effects on interest rates or consumer prices, which may complicate measuring the incidence of the tax on workers, are likely to be of minor importance." Their findings ultimately push back on the notion that the corporate tax rate is progressive. Fuest et al. (2018) conclude that based on their study's tax incidence calculations, "the estimated progressivity of the overall tax systems in both Germany and the United States [as baselined in 2007 by Thomas Piketty and Emmanuel Saez] would decrease by 25–40 percent."

Another important finding from Fuest et al. (2018) study found that "wages are more sensitive to tax changes in more profitable firms" and that "higher taxes reduce wages most for the low-skilled, women, and young workers." The latter point interestingly stands in contrast to the finding of Felix (2009) that suggested higher skilled workers bore a greater tax incidence in the wake of an increased state-level corporate tax rate.

Felix (2009) conducted an independent analysis of state corporate taxes on wages using a multivariate regression model. This model has the ability to control for multiple independent variables and apply each of them to the dependent variable independently while holding the remainder constant. She employed data from the Current Population Survey and focused on years from 1977 to 2005. Her model included real wages as a dependent variable and individual

characteristics, state characteristics, and state taxes as independent variables. While considering the coefficient on the state corporate tax rate, Felix (2009) found a statistically significant negative relationship at the one percent level.

There were two key findings from Felix's 2009 study. First, she found that "a one-percentage point increase in the marginal state corporate tax rate reduces wages 0.14 to 0.36 percent." Second, workers with higher levels of human capital were impacted disproportionately, negatively, by increases in the state corporate tax rate. More precisely, workers with at least a college degree, workers with a high school degree or some college, and workers without a high school degree saw respective wage reductions of 0.44 percent, 0.31 percent, and 0.26 percent. According to Felix (2009), this result suggests that the state corporate tax incidence is progressive, although less so than if the burden fell on shareholders of capital.

Another study done by Canadian researchers from the University of Calgary also considers the relationship between wages and corporate taxation at the subnational level. They drew conclusions about the inefficiency of generating revenue through provincially levied corporate taxes. In their 2017 report, McKenzie and Ferede find that "for every $1 in extra tax revenue generated by an increase in the provincial [corporate income tax] rate, the associated long-run decrease in aggregate wages ranges from $1.52 for Alberta to $3.85 for Prince Edward Island." By their calculations, a recent two percentage point increase in the Alberta corporate income tax rate cost the average two-earner household $830 per year. This was equivalent to a $1.12 billion loss in earnings across the province (McKenzie & Ferede, 2017).

Not all scholars agree that there is such a clear negative relationship between state corporate tax rates and wages. In fact, as alluded to above, Clausing (2011, 2013), suggested that capital bears the full burden of the corporate tax.

Clausing published two papers (2011, 2013) wherein she discussed what she understood to be significant shortcomings in the available research at the time. In 2011, she critiqued existing research involving the general equilibrium model (described above) as "suffering from data or methodological limitations." Her work focused on empirical robustness by gathering "an unusually comprehensive collection of data on labor market outcomes, focusing on [Organization for Economic Cooperation and Development] countries in the period since 1981 (Clausing, 2011)." She constructed comprehensive regression models and took pains to "focus on the economic mechanisms implied by open-economy general equilibrium tax incidence models (Clausing, 2011)." At the end of her analysis, Clausing (2011) met with mixed results. Most of the evidence did not suggest a major depression of wages resulting from an increase in corporate taxes. Nevertheless, she left room in her conclusion for the possibility that she may have missed something.

In her 2013 study, Clausing expanded on her 2011 concerns by calling for attention to be given to the degree of capital mobility; the willingness and ability for international consumers or producers to substitute products; the relative capital intensity of the corporate sector; the size of the country; the degree of factor substitution; imperfect competition; and the role of bargaining. She also cited as important several nuances of corporate tax policy including "residence-based

elements, accelerated depreciation rules, and the deductibility of debt which may result in implicit subsidization of debt-financed investments (Clausing, 2013)." After conducting another analysis of the corporate tax and labor relationship, she again concluded that there was "no robust link between corporate taxation and wages (Clausing, 2013)."

Still, other scholars believe labor bears some if not most of the state corporate tax incidence—especially if unions are involved. Felix and Hines (2009) compared union premiums—that is, the average wage benefits of belonging to a union versus not belonging to a union—from low corporate tax states to those from high corporate tax states. They found, in general, that unions and employers share the corporate tax burden in higher tax states. Conversely, when tax rates are low, employers and unions were found to share the tax savings. Felix and Hines (2009) found "that if a firm's workforce is entirely unionized, then roughly 54 percent of the cost of higher tax rates is borne by union members in the form of lower wages." The largest union wage premium, $1.88, was found in the lowest-tax states. The union premium gap endured when the authors controlled for "observable worker and firm characteristics." Felix and Hines (2009) found that the union premium wage gap was "greater for wages in capital-intensive industries, which are the most heavily impacted by high rates of corporate income taxation."

Carroll (2009) agreed with Felix and Hines (2009). Carroll wrote in 2009 that "a tax will generally be borne by the least mobile factor." Carroll's (2009) research method involved aggregating cross sectional state level data from 1970 – 2007. In this way he aimed to "directly

examine whether states with lower corporate taxes have tended to exhibit higher real wages." He took steps to limit variables that could have skewed the relationship between corporate taxes and wages by controlling for unionization, right to work laws, and other demographic features. Carroll (2009) also included state and time effects to control for a battery of unobserved variables. His results include a "statistically significant negative relationship between corporate tax rates and real hourly average earnings for production workers." More specifically, labor realized a 0.014 percent decline in wages for every 1 percent increase in the average state corporate tax rate (Carroll, 2009).

Chengrui Xiao (2019) published evidence from China on how the local business tax and surcharge (BTS) shifted from capital to labor after the BTS rate increased in 2002. Xiao's 2019 work built on much of the literature already discussed, but give special attention to the findings of Fuest, et al. (2018) . While the magnitude of the change in wages was greater than the municipal study from Germany, labor nevertheless bore more of the taxation burden than capital. Xiao (2019), concluded that "[a]veraging over all firms liable to the BTS… workers [bore] almost 62% of the BTS burden."

One criticism levied by Liu and Altshuler (2013) on previous studies involving corporate taxes and wages was that they assumed perfect competition in the marketplace. To reflect the reality of imperfect competition, the authors incorporated industry concentration ratios into their model. They chose to make industry their unit of observation "to account for the fact that in the conventional labor market environment, wages are determined at the industry level rather than

individually negotiated." After estimating a mean elasticity—a sensitivity measure—of wages of approximately -0.03, the authors applied that figure to an estimate of the labor share of corporate income tax. They found that for every $1.00 increase in the corporate tax liability, labor bore approximately $0.60.

In 2018 Suresh Nallareddy, Ethan Rouen, and Juan Carlos Suárez Serrato examined the relationship between corporate tax cuts and income inequality. Their findings fell in between those of Clausing (who suggested no relationship) and others (who suggested significant relationships between corporate tax and wages). Nallareddy et al. (2018) used regression analysis and a statistical method that compared samples with similar characteristics to study the relationship. They found that cuts to the state corporate income tax resulted in an increase in capital income of 12.6 percent for those in the top one percent of income earners. This contrasted with a statistically significant negligible increase in capital income for those at the bottom of the income distribution (Nallareddy et al., 2018). Interestingly, however, while salaries for the bottom strata of income earners increased by 1.3 percent, salaries for the top one percent decreased by 4.4 percent. The authors did not find an increase in capital investment. Rather, they concluded that top earners responded to tax cuts by shifting income from wages to capital income to reduce taxes (Nallareddy et al., 2018).

Gaps in the Knowledge

This study will attempt to extend and improve on two areas of Felix's 2009 study. First, this study will attempt to expand the body of literature on the relationship between state

corporate tax rates and wages further into the 21st Century and past the Great Recession. Although there are several published studies that examine the incidence of state corporate taxes using data collected prior to the Great Recession, works on the subject since then are scarce. There are even fewer based on data collected in the United States.

As referenced above, Felix (2009) found that "a one-percentage point increase in the marginal state corporate tax rate reduces wages 0.14 to 0.36 percent." This relationship is associated with a decline in labor's share of compensation for U.S. GDP. The data she used were gathered from the period 1977-2005. In 1977 labor's share of compensation in GDP was 62.1 percent (Feenstra et al., 2015; University of Groningen and UC Davis, 2020). By 2005 that number declined to 60.5 percent after being as high as 64 percent in 2001. As of the most recent data in 2017, labor's share of income was 59.7 percent (Feenstra et al., 2015; University of Groningen and UC Davis, 2020).

Second, this study seeks to improve two areas of internal validity from Felix's (2009) study. This study will examine data from 2009-2018 using the Census Bureau's American Community Survey (ACS) whereas Felix (2009) examined data from 1977-2005 using data from the Census Bureau's Current Population Survey (CPS).

There are several differences between the ACS and the CPS. Two of those distinctions may play an important role in the study. First, the ACS' sample size is thirty times larger than the CPS'. Second, the ACS is a mandatory survey whereas CPS is voluntary (United States Census Bureau, 2016). According to the US Census Bureau, due to the mandatory nature of the

ACS survey, it has a higher response rate than the CPS (USCB, 2016). Those characteristics are important for purposes of internal validity. Not only do larger sample sizes yield more precise estimates, but voluntary survey responses may inject an element of selection bias into the results. The Felix' (2009) finding of a negative relationship between state level corporate tax rates and wages was significant at the 0.01 level. The outcome of this study could have an important reinforcing or destabilizing effect on that negative relationship.

HYPOTHESIS

This study will examine whether a negative relationship exists between U.S. states' corporate income tax rates and average annual real wages between 2009 and 2018.

MODEL & METHODOLOGY

This study is based on the theory of tax incidence. Tax incidence theory states that a given tax will be paid by whichever party has the most inelastic demand; that is, the party which is least sensitive to its changing level. Price elasticities can be complex; but simply put, elasticities measure the willingness of a consumer to purchase a good or service given a change in the price of that good or service. Each elasticity is based on an individual's preferences and the availability of substitutes for the taxed good or service. In other words, the party that bears a given tax is not necessarily determined by which party the tax code directs to remit a tax. The burden of the tax is determined by the willingness to bear the higher cost and the availability of substitutes.

This study uses a simple observational design and controls for variables that likely influence the dependent variable through a multivariate, ordinary least squares regression. The main advantage of this statistical model is the ability to control for independent variables as if each variable was its own treatment variable in an experiment.

This study also uses an economic model that assumes an open national economy where goods, services, and factors of production can flow freely across borders.

Exhibit 1: Variable Definitions, Name, Expected Signs with Literature Justification

Definition		Variable Name	EXP Sign	Justification
Dependent Variable				
Y	Continuous variable indicating individual's annual real wage	realwage	N/A	Felix, 2009
Independent Variables				
X_1	Average Tax Rate Difference Over 2 Years	AvgTaxRateDiff2Year	-	Felix, 2009; Carroll, 2009; McKenzie and Ferede, 2017
X_2	Variable Indicating Person's Age in Years as of Last Birthday	Age	+	Felix, 2009; Fuest 2009
X_3	Squared Value of Age Variable	age2	-	Felix, 2009;
X_4	Dummy Variable for Male	male	+	Felix, 2009; Fuest 2018
X_{5a}	Categorical Variable for Completed High School Education or General Equivalency Degree (GED)	educat 2 *reference group is less than high school education	-	Felix, 2009; Fuest 2018
X_{5b}	Categorical Variable for Four or More Years of College Education	educat 3 *reference group is less than high school education	-	Felix, 2009
X_6	Dummy for Metro Area	metroarea	+	Felix, 2009
X_7	Dummy for Industries	cindustry	+	Felix, 2009
X_8	Dummy for White	white	+	Felix, 2009
X_9	Dummy for Disability	disability	-	
X_{10}	Dummy for Earning Wages or Salary	notselfemp	+	
X_{11}	Dummy for Having Moved Between States in Last Year	movedstate	+	
X_{12}	Dummy for Recession Year (2009)	recession	-	
X_{13}	Dummy variable for U.S. state	statefip	+/-	

Exhibit 2: Definition and Sources of Variables in Parameter Form

Model: $y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_{5a} X_{5a} + \beta_{5b} X_{5b} + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \varepsilon$

where:

y = realwage

respondent's pre-tax annual wage and salary income adjusted for inflation

X_1 = AvgTaxRateDiff2Year

Difference between average marginal tax rates with two years of separation (i.e. 2018 – 2016)

X_2 = age

Respondent's age in years as of last birthday

X_3 = age^2

Respondent's age in years as of last birthday squared

X_4 = male

Indicator of respondent's sex

X_{5a} = educat2

Categorical variable for completed high school education (i.e. diploma or GED)

X_{5b} = educat3

Categorical variable for four or more years of college education

X_6 = metroarea

Indicator of place of work located in metropolitan area

X_7 = cindustry

Indicator that respondent works in industry compatible with corporations (i.e. not employed by government, military, etc.)

X_8 = white

Indicator that race of respondent is white

X_9 = disability

Indicator that respondent has a physical or mental handicap

X_{10} = notselfemp

Indicator that respondent is not self-employed and instead earns a wage or salary

X_{11} = movedstate

Indicator that respondent does not live in the same state as the year prior

X_{12} = recession

Indicator of a recession year

X_{13} = statefip

Indicator of U.S. state

ε = unexplained variance, error term

β_0= intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_{5a}, \beta_{5b,}\ \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13}$ coefficients of respective independent variables: partial slope coefficients

Source of variables: X_1 constructed from data acquired from Tax Policy Center (TPC, 2020); $X_2 - X_{12}$ recoded from variables included in American Community Survey data imported from Integrated Public Use Microdata Series, United States of America (2021). Observed years range from 2009 to 2018.

ANALYSIS

Regression Models

This study examined the relationship between state corporate tax rates and labor wages by using three regression models. The first regression involved an analysis of the annual average real wage across all states, regardless of tax change status during the observed period, 2009-2018. Regression Two focused only on average annual real wages in states that increased the corporate tax rate at least once during the observed period. The third regression looked at average annual real wages from states that decreased the corporate tax rate between 2009 and 2018. The outputs of the three models are listed in Table 1.

The change in the tax rate was lagged two years from the measurement of real wage to allow for any response by capital owners to tax policy changes. Two additional regressions were run to compare the relationship between state corporate tax rates and labor wages with a one-year lag and a three-year lag. Table 2 displays the values of the real wage while controlling for the lagged tax rates.

Table 1: Relationship Between State Corporate Tax Rates and Average Annual Real Wage, 2009-2018

Real wage		Regression 1	Regression 2	Regression 3
Variables	Mean	Tax Increase States	Tax Decrease States	All States
Constant Term		-56493.06*** (-183.85)	-58869.35*** (-232.89)	-60292.22*** (-990.03)
AvgTax~2Year	-0.09	-1178.69*** (-12.30)	-56.23*** (-3.56)	-97.91*** (-11.13)
age	43.35	2551.619*** (200.98)	2590.49*** (390.29)	2450.90*** (1057.83)
age2		-27.34*** (-175.14)	-27.57*** (-338.61)	-26.01*** (-913.22)
male		10867.09*** (145.45)	11090.21*** (281.53)	11152.42*** (816.68)
educat 2		-276.15*** (-4.05)	-130.66*** (-3.91)	844.53*** (73.54)
educat 3		-19924.05*** (165.27)	21059.59*** (351.12)	21607.71*** (1010.56)
metroarea		4592.39*** (67.66)	3884.66*** (104.25)	3806.62*** (274.30)
cindustry		3331.36*** (18.10)	3299.63*** (35.06)	3186.02*** (-813.96)
white		4200.95*** (46.77)	4259.14*** (99.74)	3941.15*** (267.70)
disability		-7853.25*** (-96.48)	-8088.26*** (-195.21)	-7866.51*** (-526.53)
notselfemp		13078.65*** (68.14)	14646.46*** (147.16)	14370.85*** (433.47)
movedstate		-4527.16*** (-20.64)	-3721.99*** (-35.77)	-3515.46*** (-93.05)
recession		2047.84*** (13.13)	573.25*** (6.97)	386.95*** (17.28)
Number of States		5	21	50
Number of Observations		629,628	2,951,235	21,945,677
R-squared		0.2390	0.2637	0.2475
F-Statistic		31438.91	13867.53	99999.00
* = p < 0.5; ** = p < 0.1; *** = p < 0.001 -all regressions make use of robust standard errors -parenthetical number = t value				

Table 2: Relationship Between Lagged Tax Changes and Average Annual Real Wage in All U.S. States, 2009-2018

realwage	Coefficient	Robust Standard Error	t-value	p-value
AvgTaxRateDiff1Year	**-78.63408*** **	12.33538	-6.37	0.000
AvgTaxRateDiff3Year	**-85.3597*** **	7.455664	-11.45	0.000
* = p < 0.5, ** = p < 0.1, *** = p < 0.001				
-Refer to Appendix B for complete regression results for one-year and three- year lags.				

Regression Interpretations

To properly interpret the regression results from Table 1, it is necessary to plug the coefficients into the model equation from Exhibit 2. Of greatest interest to this study is the relationship between the key independent variable, *AvgTaxRateDiff2Year*, and the dependent variable *realwage*. First, consider the interpretation of Regression 1 that focused on states with corporate tax increases between 2009 and 2018. To interpret the regressions from Table 1, input the coefficient on *AvgTaxRateDiff2Year,* -1178.69, into the corresponding portion of the model—in this case, $\beta_1 X_1$. Then, assume a state raised the corporate tax rate from, say, 7.5 percent in 2016 to 8.5 percent in 2018. Holding the rest of the independent variables, or the remaining betas from the model, constant and assuming a one percent tax increase would reduce the model to:

$$y = \beta_1 X_1 \rightarrow -1178.69 = 1(-1178.69)$$

In other words, the regression output suggests that, on average, holding all other variables constant, and only considering states with corporate tax increases, after two years, a one percent

increase in the state corporate tax rate will result in a $1,178.69 decrease in the average annual real wage for labor.[1]

The same method of interpretation is used to understand the regression output for Regression 2 which focuses on states with corporate tax decreases. First, input the coefficient on A*vgTaxRateDiff2Year,* -56.23, into the corresponding portion of the model—again, $\beta_1 X_1$. Then, assume that a state's corporate tax rate was lowered from, say 8.5 percent in 2016 to 7.5 percent in 2018. Holding the remaining independent variables constant and assuming a one percent tax decrease would simplify the model to:

$$y = \beta_1 X_1 \rightarrow 56.23 = -1(-56.23)$$

In other words, the regression output suggests that, on average, holding all other variables constant, and only looking at states that decreased corporate tax rates, after two years, a one percent decrease in the corporate tax rate will result in a $56.23 increase in the average annual real wage for labor.

Lastly, consider the output of Regression 3, which focused on all 50 U.S. states. Up to this point, the interpretations from Regressions 1 and 2 have been interpreted with either a

[1] The informal model specification test returned a graph that depicted a strong, positive linear relationship between predicted residuals and the observed values of the dependent variable, *realwage*. The informal test result suggested there may be omitted variables in this model. The more formal Link and Ramsey tests also appear to suggest omitted variables. Nevertheless, the model results are very robust and thus allow the user to infer policy implications. Complete results for all model diagnostics as well as longer explanations of the omitted variable tests can be found in the appendix of this report.

positive or negative value in the tax rate change parameter, *B1*. In fact, the coefficient can be accurately interpreted with either a positive or negative number plugged into the beta parameter.

For example, plug the coefficient on A*vgTaxRateDiff2Year* from Regression 3 into the $\beta_1 X_1$ portion of the model equation,

$$y = \beta_1 X_1 \rightarrow -97.91 = 1(-97.91)$$

In this case it would be accurate to say that, holding all other variables constant, approximately two years after any given U.S state enacts a corporate tax increase of one percent that state realizes a $97.91 decrease in the average annual real wage for labor.

It would be equally correct to interpret the coefficient on A*vgTaxRateDiff2Year* using the opposite sign. In other words, if *B1* took the value of -1,

$$y = \beta_1 X_1 \rightarrow 97.91 = -1(-97.91)$$

the model with the same coefficient -97.91 could be interpreted as saying: holding all other variables constant, approximately two years after any given U.S state enacts a corporate tax decrease of one percent that state realizes a $97.91 increase in the average annual real wage for labor.

A two-year lag was chosen based on the rationalization that if capital owners were to react to a tax policy change, the change would likely not be felt in the same year the policy was enacted. In other words, it would most likely take some time for a corporation to adjust its business practices or compensation structure to account for the change in tax rates.

Each test result was significant at the 0.001 level. This means that there is only a one tenth of one percent chance that the results produced in these tests occurred randomly. It suggests that there is a very strong relationship between the increase in state corporate tax rates and a decline in labor wages given the dataset and specified control variables. Similarly, it suggests a very strong relationship between the decrease in state corporate tax rates and an increase in labor wages, given the dataset and specified control variables.

Trends

This study extends the study done by Felix (2009) by studying whether there was a negative relationship between the state corporate tax rates in the United States and labor wages that continued into the second decade of the 21st century. Given the output from the three models indicated above, it appears that the stated hypothesis is supported.

The magnitude of the relationship between the tax rate and wages differ to some degree from the Felix (2009) study. That is not altogether surprising, however, given the alternative data source used. The results are also similar to the vast majority of the literature which generally reflects a negative relationship, but with a variety of coefficients on the tax variable.

As reported in Table 1, between 2009 and 2018, the average annual real wage declined just under $1,200 within approximately two years of states increasing their corporate tax rates. Importantly, the magnitude of that decrease is unique to the five states in the tax increase group. In other words, if five different states had hypothetically increased their corporate tax rates, the

unique characteristics of each state may have resulted in a wage decline that was larger or smaller than $1,200.

Similarly, the magnitude of the increase in labor wages is unique to the 21 states in the tax decrease group. In other words, if a different state was substituted for any given state in the tax decrease group, the unique characteristics of that state may yield a wage increase that is larger or smaller than the $56 reported in Regression 2.

To illustrate this point, consider the following table. Table 3 compares the average wages between sexes, racial groups, and education levels based on whether those individuals resided in tax increase or tax decrease states.

Table 3: Average Annual Wages by Direction of State Corporate Tax Change, 2009-2018

Average Annual Wages	All States	States with Tax Increase	States with Tax Decrease
Total	$21,833.30	$21,290.41	$22,403.39
Men	$27,252.04	$26,481.55	$27,712.38
Women	$16,584.83	$16,243.80	$17,307.79
White	$23,171.66	$22,301.71	$23,855.94
Black and other	$17,373.71	$16,800.44	$17,233.44
Less than HS	$ 5,664.48	$ 5,113.36	$ 5,473.00
HS Degree	$16,020.46	$15,667.95	$16,012.70
College Degree	$41,339.45	$40,435.72	$42,032.96

In every category, those in states with tax decrease states earned a higher average annual wage than those in tax increase states. However, to accurately compare one state against another, each variable would need to be input into the regression model and the results of each model contrasted.

When all 50 states were included in the analysis of the relationship between state corporate tax rates and labor wages, the results bore a decidedly negative relationship. The decrease in the average annual real wage that occurred on average if a state raised corporate tax rates suggests that capital owners may be shifting the burden of the tax increase onto labor in the form of lower wages.

Relatedly, the increase in the average annual real wage that occurred on average if a state decreased corporate tax rates suggests that capital owners may be shifting some of the tax savings to increase labor compensation. Overall, the data appear to suggest that capital owners are responsive to increases and decreases in the corporate tax rate.

POLICY IMPLICATIONS

The results of this study challenge the conventional understanding of corporate tax policy in ways of progressivity, integrity, and efficiency.

First, the supported hypothesis calls into question the progressivity of state corporate taxes. Owners of corporations, the owners of capital, are presumed wealthier than their employees, the owners of labor, and are therefore presumed more capable of paying taxes. A corporate tax appeals to people who believe a tax system should be progressive—compelling those who earn more to pay a larger share of their income than those who earn less. For many, corporate taxes are attractive because they compel capital owners to "pay their fair share" and redistribute income to lower income workers.

The belief that the rich should pay more to help the poor is nothing new in the developed world, but the number of advocates for this position seems to have grown since the Great Recession. One motivation for this is the growing displeasure with the distribution of income. The Gini Index, for example, has been steadily rising since 2010 (World Bank, 2020). [2]

This paper's hypothesis, however, challenges conventional wisdom and generates uncertainty as to whether the full redistributive component of state corporate tax legislation is actually born out. Insofar as labor wages decrease with a rise in corporate tax rates, it appears that rather than contributing to greater progressivity in the tax system an increase in the corporate tax rate actually makes the system more regressive.

Relatedly, the supported hypothesis challenges the integrity of current and future corporate tax policies. Given the strength of the negative relationship (below the 0.001 level) between state corporate tax rates and labor wages, it becomes rather misleading for legislators to cite the progressivity of corporate taxes as a motivation for enactment.

Finally, a supported hypothesis challenges the efficiency of states' revenue policies. If capital owners adjust their behavior in response to the corporate tax burden, it appears that labor wages fall. As workers' incomes fall, this has the compounding result of shrinking the size of the income and sales tax bases. Consequently, revenue generated from those taxes will also diminish. As referenced above, many states literally cannot afford to have inefficient revenue streams.

[2] The Gini Index is an estimate of the income distribution. It measures the distribution of income on a scale from zero—perfectly equal distribution—to one—perfectly unequal.

The debt situation at the sub-national level is bleak. In 2020, total debt held by states and local governments reached $3.1 trillion (Board of Governors of the Federal Reserve (US), 2020). Some policymakers believe the Federal Government will bail out troubled states if the need arose; but that would just rob Peter to pay Paul. According to the Congressional Budget Office (2020), the United States' 2020 public debt, $20.3 trillion, amounted to 98 percent of gross domestic product (GDP). Even without intervening in state debt crises, that figure is expected to grow to 195% of GDP by 2050 (CBO, 2020).

There is no question that taxes are essential to the operation of state governments and the provision of many important services. It is important, however, that policymakers and their constituents understand whether the tax policies enacted are having the desired impact. They must be willing, from time to time, to reconsider the conventional wisdom and change course if necessary. Ultimately, real people bear the burden of real policies—well-intentioned or not.

APPENDIX A: MODEL DIAGNOSTICS

Table A.1: Variable Correlation

	realwage	Av~2Year	age	age2	male	educ	metroarea	cindustry	white	disability	notselfemp	movestate	recession	statefip
realwage	1.0000													
AvgTax~2Year	0.0015	1.0000												
age	0.0913	-0.0013	1.0000											
age2	0.0474	-0.0014	0.9866	1.0000										
male	0.1478	0.0013	-0.0260	-0.0255	1.0000									
educat	0.3374	0.0000	0.1608	0.1222	-0.0429	1.0000								
metroarea	0.0921	-0.0036	-0.0413	-0.0450	-0.0117	0.0957	1.0000							
cindustry	0.2957	-0.0010	-0.0576	-0.1071	0.0641	0.2503	0.0257	1.0000						
white	0.0677	-0.0104	0.1023	0.1036	0.0095	0.0954	-0.1222	0.0637	1.0000					
disability	-0.1459	-0.0023	0.1764	0.1847	0.0160	-0.1353	-0.0585	-0.2518	-0.0145	1.0000				
notselfemp	0.2856	-0.0042	-0.1282	-0.1663	0.0213	0.1971	0.0287	0.7858	0.0260	-0.2092	1.0000			
movedstate	-0.0179	-0.0010	-0.0992	-0.0934	0.0078	0.0349	0.0129	-0.0135	-0.0196	-0.0171	0.0185	1.0000		
recession	0.0062	-0.0228	-0.0104	-0.0136	-0.0022	-0.0129	-0.0001	0.0162	0.0120	-0.0085	0.0116	-0.0051	1.0000	
statefip	-0.0018	-0.0596	0.0056	0.0058	0.0002	0.0026	-0.1126	0.0213	0.0855	0.0102	0.0266	0.0007	0.0001	1.0000

When there is a strong relationship between two independent variables, also known as multicollinearity, it can be difficult to accurately discern the independent relationship each of those variables have with the dependent variable. A good way to identify if multicollinearity exists is by examining pairwise correlations. In the variable correlation test, each independent variable is separately paired with every other independent variable. If a pairwise combination of variables returns a value of 0.80 or larger, multicollinearity may exist and special attention should be paid to the relationship between those independent variables and the dependent variable.

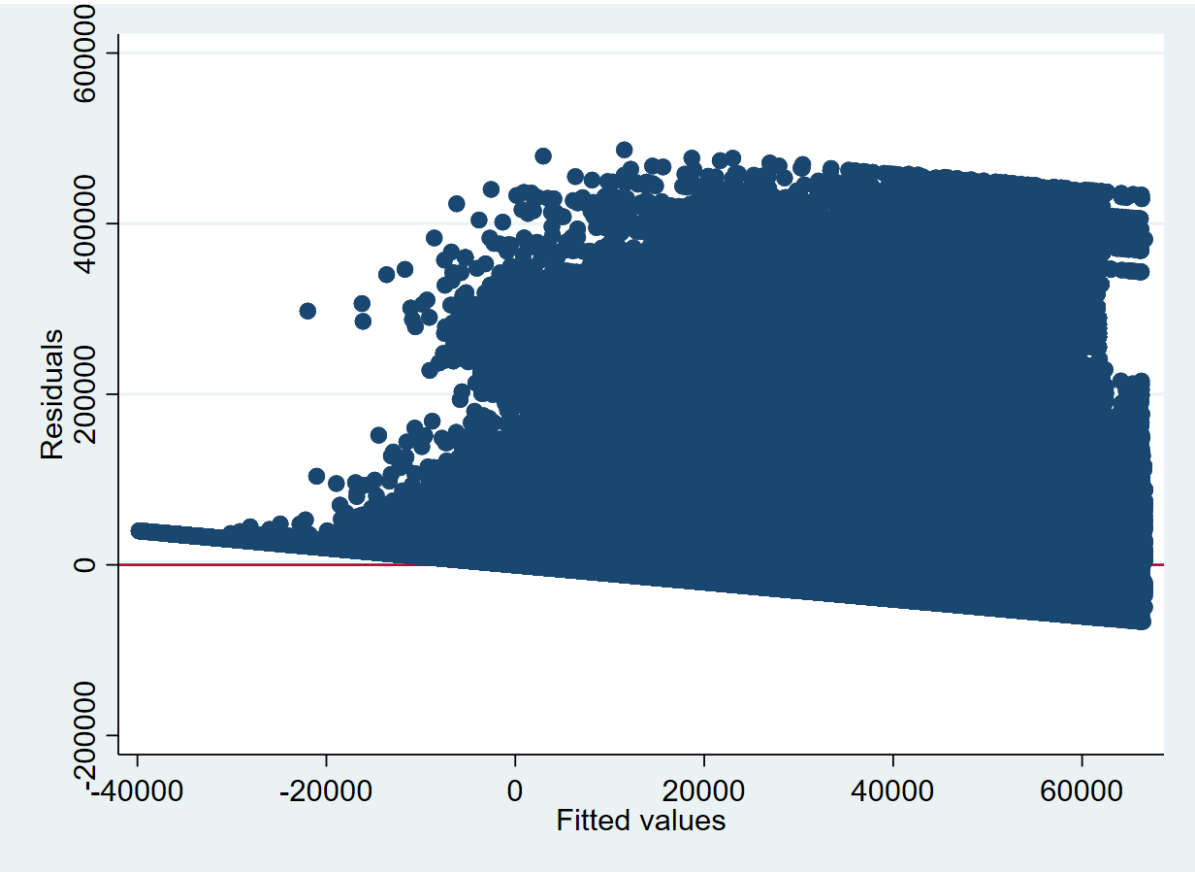

Figure A1: Informal Test for Heteroskedasticity

```
. gen uhat2 = uhat^2

. predict realwagehat
(option xb assumed; fitted values)

. reg uhat2 realwagehat c.realwagehat#c.realwagehat
```

Source	SS	df	MS		
Model	3.4760e+25	2	1.7380e+25	Number of obs	= 21945677
Residual	8.8884e+26	21945674	4.0502e+19	F(2, 21945674)	> 99999.00
				Prob > F	= 0.0000
				R-squared	= 0.0376
				Adj R-squared	= 0.0376
Total	9.2360e+26	21945676	4.2086e+19	Root MSE	= 6.4e+09

uhat2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
realwagehat	-20952.16	159.7492	-131.16	0.000	-21265.26	-20639.06
c.realwagehat#c.realwagehat	1.870052	.0034007	549.90	0.000	1.863386	1.876717
_cons	-5.65e+07	2168119	-26.08	0.000	-6.08e+07	-5.23e+07

Figure A2: Alternative White Test for Heteroskedasticity

This alternative White Test regressed predicted squared residuals on linear estimation of dependent variable and dependent variable squared. The F statistic is above the one percent

critical level and has a high level of statistical significance. We can reject the null that there is no heteroskedasticity in the model.

All of the output from the models included in the regression table above were generated with robust standard errors to compensate for the heteroskedasticity identified by the alternative White Test.

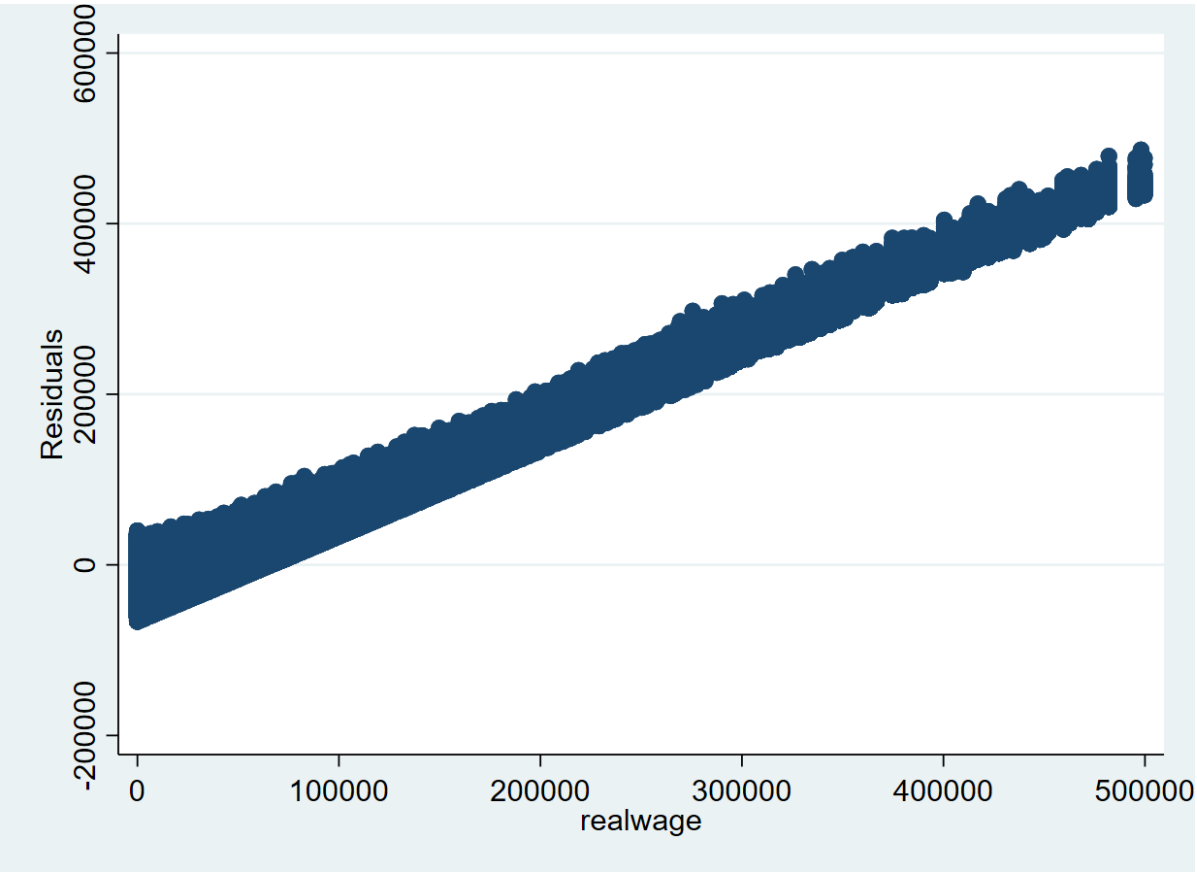

Figure A3: Informal Test for Model Specification Error

realwage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_hat	.2898366	.0007668	377.98	0.000	.2883337	.2913395
_hatsq	.0000172	1.63e-08	1051.59	0.000	.0000171	.0000172
_cons	1789.647	10.40706	171.96	0.000	1769.25	1810.045

Figure A4: Link Test for Model Specification Error

The informal model specification test returned a graph that showed a strong, positive linear relationship between predicted residuals and the observed values of the dependent

variable, *realwage*. The informal test result suggested the model may be missing other important variables. However, the formal Link Test suggests that the model is adequately specified. The formal test works by generating two variables "_hat" and "_hatsq" If a model is specified correctly, _hat should be accompanied by a statistically significant p-value. In this case, the p-value is significant beyond the 0.001 level. The _hatsq variable, however, should be accompanied by a statistically insignificant number. Since that is not the case with this Link Test, the test appears to be inconclusive.

```
Ramsey RESET test using powers of the fitted values of realwage
Ho:  model has no omitted variables
F(3, 21945610) = 590989.92
Prob > F =      0.0000
```

Figure A5: Omitted Variables Test

The Ramsey RESET test, like the Link Test, is designed to test for omitted variables in the model. The null hypothesis states that the model has no omitted variables. Since the statistical significance of this test is beyone the 0.0001 level, the null hypothesis can be strongly rejected. There is likely at least one omitted variable in the model. Given, the dependent variable deals with wage, it is not surprising that there would be an omitted variable. Any number of factors can influence a person's wage. With nearly 22 million individuals in the sample it is likely that many factors influencing wage are omitted from the model. Nevertheless, the results of the stated model are still very robust, and a user can responsibily infer policy implications from it.

APPENDIX B: FULL REGRESSION RESULTS

Table B1: Regression Results From One Year Lag (i.e. Year 2 – Year 1)

Source	SS	df	MS	Number of obs	=	21945677
				F(63, 21945613)	>	99999.00
Model	7.0735e+15	63	1.1228e+14	Prob > F	=	0.0000
Residual	2.1511e+16	21945613	980211688	R-squared	=	0.2475
				Adj R-squared	=	0.2475
Total	2.8585e+16	21945676	1.3025e+09	Root MSE	=	31308

realwage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
AvgTaxRateDiff1Year	-78.63408	13.73655	-5.72	0.000	-105.5572	-51.71093
age	2450.92	2.793486	877.37	0.000	2445.444	2456.395
age2	-26.01442	.0322907	-805.63	0.000	-26.07771	-25.95113
male	11152.4	13.45037	829.15	0.000	11126.03	11178.76
educat						
2	844.5552	21.77557	38.78	0.000	801.8758	887.2345
3	21607.99	24.65517	876.41	0.000	21559.67	21656.31
metroarea	3806.317	17.31487	219.83	0.000	3772.381	3840.254
cindustry	3186.002	28.09172	113.41	0.000	3130.943	3241.061
white	3941.244	16.5731	237.81	0.000	3908.761	3973.726
disability	-7866.724	21.46299	-366.53	0.000	-7908.791	-7824.658
notselfemp	14370.85	24.4369	588.08	0.000	14322.96	14418.75
movedstate	-3515.519	39.12853	-89.85	0.000	-3592.209	-3438.828
recession	374.0916	22.90362	16.33	0.000	329.2013	418.9818
statefip						
alaska	3599.737	154.1032	23.36	0.000	3297.7	3901.774
arizona	-492.8201	71.59764	-6.88	0.000	-633.1489	-352.4913
arkansas	115.4896	88.28894	1.31	0.191	-57.55354	288.5328
california	2765.527	57.85649	47.80	0.000	2652.131	2878.924
colorado	1163.715	74.57535	15.60	0.000	1017.55	1309.88
connecticut	6631.952	82.72152	80.17	0.000	6469.821	6794.083
delaware	672.8669	137.5527	4.89	0.000	403.2686	942.4653
district of columbia	10778.23	151.3038	71.24	0.000	10481.68	11074.78
florida	-630.1007	60.74934	-10.37	0.000	-749.1672	-511.0342
georgia	1762.05	66.0034	26.70	0.000	1632.685	1891.414
hawaii	2754.576	113.6103	24.25	0.000	2531.904	2977.248
idaho	-1421.454	110.2308	-12.90	0.000	-1637.502	-1205.405
illinois	1986.823	63.61959	31.23	0.000	1862.13	2111.515
indiana	-380.9683	71.19665	-5.35	0.000	-520.5112	-241.4255
iowa	400.0144	86.88522	4.60	0.000	229.7225	570.3063
kansas	-237.3186	89.12298	-2.66	0.008	-411.9965	-62.64079
kentucky	-15.22679	77.94389	-0.20	0.845	-167.994	137.5404
louisiana	1007.499	78.11608	12.90	0.000	854.3943	1160.604
maine	-2139.166	116.4523	-18.37	0.000	-2367.408	-1910.923
maryland	6225.873	72.83941	85.47	0.000	6083.111	6368.636
massachusetts	3939.366	70.55851	55.83	0.000	3801.074	4077.658
michigan	-607.7614	65.91972	-9.22	0.000	-736.9617	-478.5611
minnesota	1649.274	74.46804	22.15	0.000	1503.32	1795.229
mississippi	534.5111	88.21718	6.06	0.000	361.6086	707.4136
missouri	-884.4942	72.33402	-12.23	0.000	-1026.266	-742.7221
montana	-795.4381	131.4834	-6.05	0.000	-1053.141	-537.7352
nebraska	-505.6894	103.1577	-4.90	0.000	-707.8747	-303.504
nevada	467.4623	89.93514	5.20	0.000	291.1926	643.7319
new hampshire	1966.634	114.0024	17.25	0.000	1743.193	2190.074
new jersey	6102.174	67.56335	90.32	0.000	5969.752	6234.595
new mexico	-742.3405	101.3169	-7.33	0.000	-940.9179	-543.7631
new york	3361.397	60.48728	55.57	0.000	3242.844	3479.95
north carolina	39.50049	66.18785	0.60	0.551	-90.22533	169.2263
north dakota	1979.741	149.208	13.27	0.000	1687.299	2272.184
ohio	-625.9102	64.91495	-9.64	0.000	-753.1411	-498.6792
oklahoma	1154.516	82.40132	14.01	0.000	993.0128	1316.02
oregon	-890.1276	80.16232	-11.10	0.000	-1047.243	-733.0123
pennsylvania	51.31593	63.51016	0.81	0.419	-73.16169	175.7936
rhode island	623.5904	126.219	4.94	0.000	376.2056	870.9752
south carolina	-1076.456	76.4315	-14.08	0.000	-1226.259	-926.6532
south dakota	237.3681	142.132	1.67	0.095	-41.20551	515.9416
tennessee	-693.2289	71.20795	-9.74	0.000	-832.7939	-553.6639
texas	1644.017	59.15576	27.79	0.000	1528.074	1759.96
utah	-244.4747	89.88821	-2.72	0.007	-420.6523	-68.29699
vermont	-988.5826	155.4845	-6.36	0.000	-1293.327	-683.8386
virginia	4076.119	67.86732	60.06	0.000	3943.102	4209.137
washington	2296.861	70.02487	32.80	0.000	2159.615	2434.107
west virginia	-28.45329	103.225	-0.28	0.783	-230.7705	173.8639
wisconsin	418.3483	73.05432	5.73	0.000	275.1645	561.5322
wyoming	3161.71	165.8136	19.07	0.000	2836.721	3486.698
_cons	-60291.22	76.78071	-785.24	0.000	-60441.71	-60140.73

Table B2: Regression Results From Three Year Lag (i.e. Year 4 – Year 1)

Linear regression

Number of obs	= 21945677
F(63, 21945613)	> 99999.00
Prob > F	= 0.0000
R-squared	= 0.2475
Root MSE	= 31308

realwage	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
AvgTaxRateDiff3Year	-85.3597	7.455664	-11.45	0.000	-99.97253	-70.74687
age	2450.948	2.316902	1057.86	0.000	2446.407	2455.489
age2	-26.01479	.028486	-913.25	0.000	-26.07062	-25.95896
male	11152.4	13.65575	816.68	0.000	11125.63	11179.16
educat						
2	844.4089	11.48432	73.53	0.000	821.9001	866.9178
3	21607.54	21.382	1010.55	0.000	21565.63	21649.45
metroarea	3806.972	13.87744	274.33	0.000	3779.773	3834.171
cindustry	3185.921	31.21014	102.08	0.000	3124.75	3247.092
white	3941.301	14.72224	267.71	0.000	3912.446	3970.156
disability	-7866.629	14.94024	-526.54	0.000	-7895.911	-7837.347
notselfemp	14370.92	33.153	433.47	0.000	14305.95	14435.9
movedstate	-3515.56	37.77972	-93.05	0.000	-3589.607	-3441.513
recession	399.7178	22.38048	17.86	0.000	355.8529	443.5827
statefip						
alaska	3591.171	128.3171	27.99	0.000	3339.674	3842.668
arizona	-525.5337	58.65785	-8.96	0.000	-640.5009	-410.5664
arkansas	115.7009	66.12655	1.75	0.080	-13.90474	245.3066
california	2765.469	47.44599	58.29	0.000	2672.476	2858.461
colorado	1163.848	67.98936	17.12	0.000	1030.591	1297.104
connecticut	6631.894	105.9455	62.60	0.000	6424.245	6839.543
delaware	516.2699	126.9562	4.07	0.000	267.4403	765.0995
district of columbia	10763.43	221.4763	48.60	0.000	10329.35	11197.52
florida	-630.1497	49.58727	-12.71	0.000	-727.3389	-532.9604
georgia	1762.156	55.02567	32.02	0.000	1654.308	1870.005
hawaii	2754.725	94.07041	29.28	0.000	2570.351	2939.1
idaho	-1424.75	82.76004	-17.22	0.000	-1586.957	-1262.544
illinois	2017.446	54.78888	36.82	0.000	1910.062	2124.831
indiana	-419.1273	55.27667	-7.58	0.000	-527.4676	-310.787
iowa	400.3461	65.30143	6.13	0.000	272.3576	528.3345
kansas	-210.7395	72.44392	-2.91	0.004	-352.7269	-68.75199
kentucky	-23.41118	61.13129	-0.38	0.702	-143.2263	96.40396
louisiana	1007.437	62.41395	16.14	0.000	885.1081	1129.766
maine	-2138.979	87.08364	-24.56	0.000	-2309.66	-1968.298
maryland	6246.529	70.61792	88.46	0.000	6108.121	6384.938
massachusetts	3912.618	70.19986	55.74	0.000	3775.029	4050.208
michigan	-537.1536	52.82622	-10.17	0.000	-640.691	-433.6161
minnesota	1649.479	63.75792	25.87	0.000	1524.516	1774.443
mississippi	534.7142	64.49019	8.29	0.000	408.3157	661.1126
missouri	-884.4507	57.48912	-15.38	0.000	-997.1273	-771.774
montana	-794.7872	97.6703	-8.14	0.000	-986.2175	-603.3569
nebraska	-505.4671	80.55403	-6.27	0.000	-663.3501	-347.5841
nevada	467.3654	76.35511	6.12	0.000	317.7121	617.0187
new hampshire	1964.021	107.562	18.26	0.000	1753.203	2174.838
new jersey	6102.053	68.61909	88.93	0.000	5967.562	6236.544
new mexico	-752.9684	75.40632	-9.99	0.000	-900.7621	-605.1747
new york	3343.621	53.42465	62.59	0.000	3238.911	3448.332
north carolina	-22.65322	54.40257	-0.42	0.677	-129.2803	83.97386
north dakota	1946.002	123.2016	15.80	0.000	1704.532	2187.473
ohio	-743.6676	53.47893	-13.91	0.000	-848.4843	-638.8508
oklahoma	1154.75	63.64944	18.14	0.000	1029.999	1279.501
oregon	-881.3312	66.62487	-13.23	0.000	-1011.913	-750.7488
pennsylvania	51.31898	51.5762	1.00	0.320	-49.76852	152.4065
rhode island	587.9718	116.1849	5.06	0.000	360.2536	815.69
south carolina	-1076.423	60.25552	-17.86	0.000	-1194.521	-958.3241
south dakota	237.8933	104.1357	2.28	0.022	33.791	441.9957
tennessee	-693.1869	58.16815	-11.92	0.000	-807.1944	-579.1794
texas	1644.084	48.04361	34.22	0.000	1549.92	1738.248
utah	-244.3865	75.26035	-3.25	0.001	-391.8941	-96.87893
vermont	-997.2668	124.6861	-8.00	0.000	-1241.647	-752.8865
virginia	4076.181	61.2381	66.56	0.000	3956.156	4196.205
washington	2296.925	61.37628	37.42	0.000	2176.63	2417.221
west virginia	-67.88608	74.05754	-0.92	0.359	-213.0362	77.26404
wisconsin	418.5196	58.39655	7.17	0.000	304.0645	532.9748
wyoming	3162.203	134.86	23.45	0.000	2897.882	3426.524
_cons	-60294.48	60.90003	-990.06	0.000	-60413.84	-60175.11

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