

Corporate Income Taxes and Labor: An Investigation of Empirical Evidence

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Abstract:

With the highest top marginal corporate tax rate among OECD nations and the third-highest in the world at 35 percent, it is not surprising that policymakers have long evinced a desire to lower the U.S. federal corporate income tax rate. Reducing the corporate income tax rate has implications for a wide-range of outcomes— from federal revenues to foreign direct investment, but the effects of such a change on workers is less understood. This paper examines the empirical literature on the effect of corporate income taxes on labor, specifically on employment and worker incomes. In general, empirical work with the most robust results and controlling for factors of influence outside of corporate income taxes generally have an elasticity of employment with respect to the corporate income tax rate of between -0.2 and -0.4, with a wage/income elasticity near -0.5. In the context of recent tax reform discussions that propose a rate reduction between 30% to 57%, that would imply employment gains between 6% to 22% and wage increases between 15% to 28%.

Keywords: Corporate Income Tax, Employment, Wages, Incidence

JEL Codes: H25; H22

Executive Summary

With the highest top marginal corporate tax rate among OECD nations and the third-highest in the world at 35 percent, it is not surprising that policymakers have long evinced a desire to lower the U.S. federal corporate income tax rate. Doing so would have implications for a wide-range of outcomes—from federal revenues to foreign direct investment—but the effects of such a change on the labor market is less understood.

Despite high corporate income tax rates, the U.S collects relatively little revenue from the corporate income tax—slightly over \$300 billion in 2016, which amounts to about 10 percent of all federal receipts. High corporate income tax rates are cause for concern as they deter multinationals from locating investment in the United States and reduce the amount of capital formation in the country, which impact employment and wages.

There is a wide range of methods by which economists establish the impact that the corporate income tax has on employment and wages, including international, national, and state-level comparisons. The key to any empirical work is attempting to disentangle the effects of the corporate income tax from other factors that may be correlated with both the corporate tax and labor outcomes. We find estimates that use a treatment and comparison set up within the framework of the vast array of state-level corporate tax changes to be the most effective way to establish a clear link between corporate taxes and labor outcomes. Other work that relies only on federal changes is complicated by the many national factors that also change with time.

In general, empirical work with the most robust results and controlling for factors of influence outside of corporate income taxes generally suggest an elasticity of employment with respect to the corporate income tax rate of between -0.2 and -0.4, with a wage/income elasticity near -0.5. In the context of recent tax reform discussions that propose a rate reduction of ten to twenty percentage points, that would imply long-run employment gains between 6% to 22% and wage increases between 15% to 28%.

In terms of applicability to potential federal changes to the corporate income tax there are some caveats to consider. First, all empirical estimates are necessarily from a different time and place as the one where a new policy will be implemented. Second, the U.S has a different baseline than other countries that change corporate tax policy. Third, it is unclear how other countries, U.S. state government policy, and our own federal reserve may react to federal corporate tax policy changes. Finally, the state-level estimates we cite are all in the context of existing federal policy, and these differences pale in comparison to many international business climate differences. Although there is some uncertainty about how well existing empirical estimates would translate to any federal corporate income tax reduction, we find the notion that corporate tax reform would boost employment and wages to be a robust result.

I. Introduction

The United States has the highest top marginal corporate income tax rate among the Organization for Economic Co-operation and Development (OECD) members at 35 percent (38.9 percent when combined with sub-national taxes).¹ Not only is the U.S. corporate tax rate the highest among the OECD group, but it is the third highest rate in the world, surpassed only by Puerto Rico and the United Arab Emirates (Pomerleau and Potosky, 2016).² Meanwhile, corporate income tax rates have been declining around the world for the last two decades; Since 2003 the average corporate income tax rate in the OECD has fallen from 30 percent to 22.5 percent in 2016 (Pomerleau and Potosky, 2016).

Despite high corporate income tax rates, the U.S. collects relatively little revenue from the corporate income tax—slightly over \$300 billion in 2016, which amounts to about 10 percent of all federal receipts.³ High corporate income tax rates are cause for concern; for starters, high rates deter multinationals from locating investment in the United States, and more generally reduce the amount of capital formation in the country. Lowering corporate tax rates is cited as a top policy priority by multinational corporations over changing other aspects of the tax code (Neubig, 2006).

More generally, the contrast between the high rates and low income illustrates a basic problem with taxing corporation income: it is an incredibly distorting tax. Companies go to great lengths to reduce or eliminate tax liability, and despite the best intentions of Congress or the White House it can be difficult or impossible--both from a political or a practical perspective--to reduce or eliminate such behavior.

However, the tax treatment of corporations may also have implications that extend beyond the boardroom to impact the U.S. labor force. There is a growing empirical literature on the effect of corporate income taxes on employment and income. Empirical estimates, rather than theoretical models that abstract from many of the realities of the U.S. and world economy, offer the best hope for understanding how changes to the current federal corporation income tax may affect workers. Empirical estimates in the existing literature do come with a unique set of challenges—among them methodological issues, data applicability, and the geographic area analyzed--that do not make them perfectly applicable to recent tax reform discussions without some caveats.

In general, empirical work with the most robust results, that best control for other factors of influence, estimate an elasticity of employment with respect to the corporate income tax rate between -0.2 and -0.4, with a wage/income elasticity near -0.5. In terms of

¹ 2017 rates according to Table II.1 in corporate capital income tax tables at: http://www.oecd.org/tax/tax-policy/tax-database.htm#C_CorporateCapital

² Pomerleau, Kyle and Emily Potosky, 2016, "Corporate Income Tax Rates Around the World, 2016" The Tax Foundation Fiscal Fact No.525.

³ Corporate taxes averaged 10.1 percent of federal receipts between 2000 and 2015, Office of Management and Budget Historical Tables 2.2: <https://obamawhitehouse.archives.gov/omb/budget/Historicals>

prediction, these elasticities imply that a 10 percent decrease in the corporate tax rate would lead to a 2 to 4 percent increase in employment, and a 5 percent gain in wages.

II. The Corporate Income Tax and Labor: Conceptual Framework

The economic effects of the corporate income tax are wide-ranging. As the corporate income tax is essentially a tax on profits, it affects all decisions regarding how corporations earn a profit—while most important for our purposes has to do with how it impacts employment and wages but the corporate income tax also affects where firms locate, the amount of capital investment as well as where to locate that investment, and various other decisions.

Incidence of the Corporate Income Tax on Employment

There is a long literature that examines the incidence of corporate taxes, with implications for employment (and wages). “Incidence” refers to which entity bears the burden of the tax after considering the cumulative effects the tax may have on various prices and corporate behavior. The entity that writes the check does not necessarily pay the tax, economics has long taught us.

For example, when corporate taxes increase, we would say that workers effectively pay the incremental tax if we observed that wages and employment decline as a result. Alan Auerbach (2005)⁴ offers an extensive review of corporate tax incidence, focusing on how theoretical models explain the incidence of the corporate tax and how different variations of these models can imply something different about who ultimately pays for the corporate tax. Auerbach points out that if a corporate income tax causes the capital-labor ratio to decline, it would result in falling wages, and workers bearing a burden of the tax.

Desai, Foley, and Hines (2007)⁵ offer a lucid explanation of how corporate income taxes may in theory adversely affect workers in both a closed and open economy. In a closed economy model, which probably doesn’t represent the U.S. well, Desai et al. point out that taxes on corporate income raise the cost of production done by corporations. However, not all production is done through corporations--The high corporate tax rates have beget a large number of partnerships, sole proprietorships, S-corporations, and other pass-through entities--so the corporate tax may induce production to shift to the non-corporate sector. If the ratio of capital to labor is higher in the non-corporate sector,

⁴ Auerbach, Alan, 2005, “Who bears the corporate tax?”, in Tax Policy and the Economy Vol. 20 National Bureau of Economic Research, Cambridge, MA.

⁵ Desai, Mihir, Fritz Foley, and James Hines, 2007, “Labor and Capital Shares of the Corporate Tax Burden: International Evidence” Unpublished Manuscript prepared for presentation at the International Tax Policy Forum and Urban-Brookings Tax Policy Center conference on Who Pays the Corporate Tax in an Open Economy?, 18 December, 2007.

resources flowing into the non-corporate sector will raise the demand for capital in turn, which could conceivably raise the after-tax return on capital enough to induce substitution away from labor and toward capital. The result would be that workers bear the burden of the corporate income tax.⁶

Desai et al. also aver that in an open economy, which may be a better representation of the U.S., corporate taxes may be even more likely to be paid for by workers. Their intuition is that if capital is mobile across international borders, then the after-tax return to capital must be the same across the economies of the world in equilibrium (presuming that capital flows to the highest after-tax return destination). If this is true, corporate income taxes discourage investment in a country. Also, because the after-tax return to capital must equalize across countries, inputs that are immobile (or less mobile) will bear the burden of the corporate income tax. Labor, or other less mobile factors of production, would therefore pay for the corporate income tax via lower wages.

III. Empirical Evidence on the Corporate Tax–Labor Relationship

The intuition in Desai et al. comes from a long line of theoretical work on the corporate income tax. Economists have traditionally used dynamic, general equilibrium, theoretical models of the U.S. economy to study how corporate taxes affect employment and wages. The problem with these models is that they may miss important aspects of the real economy that are relevant in the relationship between corporate taxes and outcomes for workers. More recently, the availability of data and advances in econometric techniques has allowed for an empirical investigation into how corporate taxes affect economic activity. We examine that literature to gain an understanding of how the corporate income tax effects labor--not in theory, but in practice.

U.S. Evidence at the Federal Level

Mertens and Ravn (2013)⁷ provide the only recent direct evidence on the effects of the federal corporate income tax rate on employment. They rely on the “narrative” method of estimation, following Romer and Romer (2010),⁸ which attempts to sort out tax changes that were in effect a “surprise” to the economy. The goal is to separate the effect of the tax change from other factors that occur simultaneously in the economy--most notably a response to deficit concerns.

Mertens and Ravn rely on a sample of quarterly data on the U.S. economy s from 1950

⁶ Desai et al. note that this effect is mitigated by the fact that labor costs are deductible under a corporate income tax, so the initial effect of a corporate income tax would be to substitute toward labor in the corporate sector.

⁷ Mertens, Karel, and Morten O. Ravn, 2013, “The dynamic effects of personal and corporate income tax changes in the United States”, *American Economic Review* 103: 1212–1247.

⁸ Romer, Christina and David Romer, 2010, “The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks”, *American Economic Review* 100 (3):763–801.

to 2006, and examine corporate tax *liability* rather than a policy measure like corporate tax rates directly. They find that a one percentage point reduction in the average corporate income tax rate increases real GDP per capita immediately by 0.4 percent, and by another 0.6 percent with a one-year lag. They also find that cutting the average corporate tax rate does not impact tax revenues, and does not impact employment in the aggregate.

While the Mertens and Ravn work is novel in its approach and unique in examining U.S. federal corporate taxes only, it has several shortcomings that call into question the failure to discern any employment impacts of a change in the corporate tax rate.

First, the analysis uses the average corporate tax rate as a measure of corporate income tax policy, calculated as tax liability divided by corporate profits. The problem with this is that anything that impacts corporate profits or general tax liability that might also affect employment might bias the results of the study. For example, if the economy is moving into recession corporate profits typically shrink. This would artificially inflate the Mertens and Ravn measure of average corporate tax rate at a time when firms are likely shedding employees- causing estimates of tax policy to be biased against finding an employment effect.

Second, it relies on a very small set of corporate tax changes--16 in total over 56 years of data. In fact, Ljungqvist and Smolyansky (2016)⁹ point out that there have been only three rate changes to the top federal corporate tax rate since 1969 (as opposed to 271 state-level changes): a two percentage point decline in 1979, a twelve point reduction in 1986, and a one percentage point increase in 1993. It is not clear to us how representative are the changes identified by Mertens and Ravn beyond the three explicit rate reductions in the current economic climate.

Finally, Mertens and Ravn ultimately rely on time-series variation and simply cannot rule out the possibility that other factors in the economy changing at or around the same time as their narrative shocks are driving their results. Mertens and Ravn are not able to construct a valid counterfactual benchmark for how the U.S. employment situation would have evolved in the absence of corporate income tax changes in their work.

Evidence from U.S. States

The promise of using state-level changes in the corporation tax rate is that it provides a much larger and more robust data set that makes controlling for economic fluctuations and similar exogenous forces easier to accomplish.

Harden and Hoyt (2003)¹⁰ provide an important review the older economic literature that

⁹ Ljungqvist, Alexander and Michael Smolyansky, 2016, "To Cut or Not to Cut? On the Impact of Corporate Taxes on Employment and Income", Working Paper, Finance and Economics Discussion Series Federal Reserve Board of Governors.

¹⁰ Harden, J. William and William H. Hoyt, 2003, "Do States Choose Their Mix of Taxes to Minimize Employment

generally examines how state taxes (including business incentives and the corporate tax) affect employment, as well as an analysis of how corporate taxes affect employment. Using annual U.S. state-level data between 1977 and 1994, Harden and Hoyt control for fixed state and year differences in the data, and by doing so identify the effect of corporate taxes on employment using state level corporate tax changes. Harden and Hoyt take an all-encompassing view of the corporate tax, measuring the size of the corporate tax burden as corporate tax revenues divided by personal income in a state. Importantly, because corporations may take time in adjusting to corporate tax policy, Harden and Hoyt examine the effects on employment through a lagged relationship.

Harden and Hoyt find a negative and statistically significant relationship between the corporate tax burden in a state and employment growth. Holding total revenue constant, Harden and Hoyt estimate that shifting 10 percent of the tax burden in a state from the corporate tax to another revenue source would increase the employment growth rate by 2.83 percent. Notably, the gains Harden and Hoyt report are for individual income taxes replacing corporate taxes; employment gains would likely be larger if revenues were replaced with a more efficient tax such as a value-added tax, carbon tax, or some other tax on consumption.

Felix (2009)¹¹ extends the previous literature by examining the effect of U.S. state corporate taxes on worker wages using a more recent data set spanning the period between 1977-2005. Felix estimates the relationship between corporate taxes and wages using a simple regression framework; he controls for the many other factors besides taxes that might affect worker wages including individual factors (such as age, education, occupation, etc.) as well as other state-level factors (income taxes, sales taxes, government services, etc.). He uses the top marginal corporate tax rate in a state to measure the corporate tax burden and estimate the relationship between corporate taxes and wages.

The Felix model indicates a negative and statistically significant relationship between the top marginal corporate tax rate and worker wages, with a magnitude that suggests a one percentage point increase in the top corporate tax rate will reduce employment by between 0.14 and 0.36 percent: A 15 percent corporate rate reduction translates to employment gains between two and five percent--*the equivalent of 2.8 to seven million new workers.*

Felix also shows that while the effect of the top marginal corporate tax rate is negative throughout the sample period, *the relationship between the corporate tax rate and employment is stronger in the latter part of the sample* than in the early part. In fact, between 1997 and 2001 a one percentage point increase in the top corporate tax rate reduces employment by nearly .7 percent, which is more than double the effect in the

Losses?", National Tax Journal 56(1): 7–26.

¹¹ Felix, R. Alison, 2009, "Do State Corporate Income Taxes Reduce Wages?", Economic Review- Federal Reserve Bank of Kansas City 94(2): 77–102.

earlier years of the sample. The changing relationship between the corporate tax and wages could be the result of increased competition among U.S. states or by foreign nations for mobile capital, he hypothesizes.

Shuai and Chmura (2013)¹² further extend previous analyses of U.S. state corporate tax policy by using updated data on job creation and state corporate tax policy changes between 1990 and 2012. During the sample period used by Shuai and Chmura, thirty states made corporate tax rate changes, which offers a “laboratory” to discover how differences in the corporate tax rate effect job creation.

The Shuai and Chmura model controls for general time effects using a fixed-effects estimation strategy, which offers control over many other factors that could potentially bias their study, but their preferred model does not incorporate state-level fixed effects. The Shuai and Chmura estimates indicate that state corporate tax rates are negatively and statistically significantly related to employment growth. They estimate that employment will grow 0.03 to 0.05 percentage points faster in a state with a one-percentage point lower corporate tax rate, or that the elasticity of employment with respect to the corporate tax rate is -0.2. That translates to employment growth .6% to 1% faster per year for a reduction in the corporate tax rate to 15% as proposed by the Trump Administration.

Giroud and Rauh (2015)¹³ also exploit state corporate tax policy differences as they relate to employment and business establishment location. They constructed a sample of all U.S. business establishments with at least 100 employees that are active in multiple states between 1977–2011. Their model controls for constant differences among states as well as time varying characteristics that are common to all states and many other economic factors that differ both across states and time.

They find that a one-percentage point increase in a state corporate tax rate leads to the closing of 0.03 business establishments, and that about half of the effect occurs because firms have the ability to shift location to competing states. On the employment side, Giroud and Rauh find that *a 10 percent increase in the corporate tax rate corresponds to a 4 percent decline in employment at corporations subject to the tax increase.* As check for spurious correlation, Giroud and Rauh find no correlation between employment at corporations and changes in the personal income tax rate, lending credibility to their estimates.

Finally, Ljungqvist and Smolyansky (2016) estimate the effect of U.S. state corporate tax changes using the experience of counties located on the border of states with differing tax policies. Their data span 1970–2010, and they examine 140 separate tax

¹² Shuai, Xiaobing and Christine Chmura, 2013, “The Effect of State Corporate Income Tax Rate Cuts on Job Creation”, *Business Economics* 48(3): 183–193.

¹³ Giroud, Xavier and Joshua Rauh, 2015, “State Taxation and the Reallocation of Business Activity: Evidence from Establishment-Level Data” National Bureau of Economic Research Working Paper 21534.

increases in 45 states (and DC) and 131 tax cuts in 35 states for their analysis. The employment data they analyze is taken from the Regional Economic Accounts Bureau of Economic Analysis, which documents annual employment and income at the county level. Their analysis relies heavily on the natural experiment approach to state corporate tax changes, but also controls for time-varying factors such as demographic characteristics of residents.

They find that increasing the corporate tax rate leads to significant reductions in employment (and income) for residents. They estimate that *a one-percentage point increase in the top marginal corporate income tax rate reduces employment by 0.3–0.5 percent*, but also find that cutting corporate taxes does not have a corresponding positive effect unless the government implements the reductions during a recession.

They also find a large effect on incomes, with a one-percentage point increase in the top marginal corporate income tax rate corresponding to an income loss of between 0.3% and 0.6%. Cutting corporate taxes does not have a corresponding positive effect on income, unless (again) these cuts are made during a recession.

Importantly, Ljungqvist and Smolyansky use a measure of employment and income based on the residence of individuals and *not* the location of businesses. This likely means they underestimate the effect of corporate taxes on the outcomes of interest because workers themselves are mobile and may look for work in neighboring counties in response to corporate tax changes that impact their wages.

As a partial solution to this problem, Rohlin, Rosenthal, and Ross (2014)¹⁴ use data that is based on business location and apply a similar border-method to state-level corporate tax changes. They examine the effects of tax changes on the propensity for businesses to open in the face of corporate income tax changes and find extremely large and negative effects--a higher corporate tax substantially reduces the probability that a new business starts operation in an area, which necessarily reduces employment as well. The primary sample used by Rohlin, Rosenthal, and Ross examines border states with a reciprocal tax agreement so that labor mobility across the border is not an issue in estimation.

The data show that a one-percentage point increase in the top marginal corporate tax rate reduces the likelihood of a corporate business opening in the county by a whopping 34 percentage points. This effect is larger for manufacturing and service based businesses, and slightly smaller for retail based businesses.

In short, the data from state-bases research consistently reveals that higher corporate taxes reduce employment and compensation.

¹⁴ Rohlin, Shawn, Stuart Rosenthal, and Amanda Ross, 2014, "Tax Avoidance and Business Location in a State Border Model", *Journal of Urban Economics* 83: 34–49.

International Evidence

The U.S state corporate tax literature may offer the most potential for understanding the effects of changing federal corporate tax policy, as states all operate within the laws and business climate of the U.S. However, state corporate tax policy may be dwarfed by federal policy, so using state data to infer the impact of changes at the federal level may very well cause economists to underestimate the size of expected federal changes.

Examining corporate tax policy from an international perspective is advantageous because it can give a clearer picture of the potential effects of corporate tax policy changes on a national basis; however, the apparent gain in estimating size effects comes at the cost of examining corporate taxes in what is often a completely different legal and business environment than that of the U.S. What's more, most other OECD countries--usually the comparisons used, by dint of the availability of data as well as the fact that they comprise the universe of developed countries--are much more closely integrated with their immediate neighbors and trading partners than is the U.S., making such comparisons complicated.

A few international studies are similar to the analysis across U.S. states, examining corporate tax policy across areas within a country where policy differs. We analyze a few such studies, all of which have been published relatively recently.

For instance, Feld and Kirchgassner (2002)¹⁵ examine the effect of corporate taxes on resident employment across Swiss cantons (a canton is a division of the country similar to states in the U.S.), and they show that corporate income taxes deter firms from operating and reduce employment for residents after controlling for factors like wages, education, and demographic differences. Their data encompasses the years 1985–1997, in a context of low federal corporate income taxes, and reveal a relatively small magnitude of response from employment—a ten percent increase in corporate tax leads to an employment loss of about 1 percent.

Djankov et al. (2010)¹⁶ study the effect of corporate taxes using a cross-section of 85 countries in the year 2004, focusing on how one country's policy would impact a standardized firm. This approach is interesting as it examines corporate tax policy in many countries, but the use of only a cross-section, as opposed to a panel of data, means that other differences across countries may be influencing the results. Djankov et al. do not examine employment directly, but instead examine entrepreneurship, finding that corporate taxes have a large negative impact on entrepreneurial activity (as well as a large negative effect on foreign direct investment, which is directly relevant to

¹⁵ Feld, Lars and Gebhard Kirchgassner, 2002, "The Impact of Corporate and Personal Income Taxes on the Location of Firms and on Employment: Some Panel Evidence for the Swiss Cantons", *Journal of Public Economics* 87:129–155.

¹⁶ Djankov, Simeon, Tim Ganser, Caralee McLiesh, Rita Ramalho, and Andrei Shleifer, 2010, "The effect of corporate taxes on investment and entrepreneurship", *American Economic Journal: Macroeconomics* 2, 31–64.

job creation and wages). They estimate that a ten percentage point increase in the corporate tax rate (applying to first year businesses) reduces the number of firms by 1.9 per 100 people, or by 38 percent. They also find that a ten percentage point increase in the average corporate tax rate reduces the rate of businesses entering a country by 1.4 percentage points, or 17.5 percent at the mean.

Using a smaller sample of countries over a 25 year panel, Hassett and Mathur (2015)¹⁷ are able to account for country-specific fixed effects, or anything else about a country that differs, besides the corporate tax, and is constant across time. The Hassett and Mathur model also controls for time period effects and other factors that change across both time and countries besides corporate taxes. They find that corporate taxes (measured as either effective or marginal rates) have a substantial negative effect on worker wages— *a one percent increase in the corporate tax rate leads to a 0.5 percent decline in wages.*

Arulampalam, Devereux, and Maffini (2012)¹⁸ also use a panel of data, examining 55,000 individual companies operating in nine European countries (Belgium, Finland, France, Germany, Italy, The Netherlands, Spain, Sweden, and the U.K.) to examine the effect of corporate taxes on employee wages over the years 1996–2003. Using microdata on individual firms allows the study to control for many factors that may not be accounted for in previous studies. They are also able to examine the impact of tax changes at the individual company-level, which is advantageous because it accurately depicts exactly the amount of tax being paid, although it is harder to interpret from a policy perspective. Arulampalam et al. find that a one-dollar increase in taxes results in companies total wage bill falling by 49 cents. This effect could come via reduced wages, lower employment, or some combination of the two.

Besides the previously mentioned theoretical explanation in Desai et al. (2007), their work offers an empirical investigation into the incidence of the corporate tax using data from American multinational firms operating between 1989 and 2004. They estimate that a large portion of corporate taxes are borne by workers. While their estimates depend on the time period and empirical specification, they show that ultimately workers' pay between 45 and 75 percent of the corporate tax burden, which suggests that wages and employment necessarily fall when corporate tax rates rise and vice versa.

Da Rin and Di Giacomo (2009)¹⁹ show that corporate tax policy may interact with other aspects of a country's economy, and find that countries with better "institutional infrastructure"—that is, a respect for the rule of law, predictable changes in policy, and

¹⁷ Hassett, Kevin and Aparna Mathur, 2015, "A Spatial Model of Corporate Tax Incidence", *Applied Economics* 47(13): 1350–1365.

¹⁸ Arulampalam, Wiji, Michael Devereux, and Giorgia Maffini, 2012, "The Direct Incidence of Corporate Income Tax on Wages", *European Economic Review* 56:1038–1054.

¹⁹ Da Rin, Marco and Marina Di Giacomo and Alessandro Sembenelli, 2009, "Entrepreneurship, Firm Entry, and the Taxation of Corporate Income: Evidence from Europe", *Journal of Public Economics* 95(9–10):1048–1066.

strong property rights protected by courts with deep knowledge of such issues-- experience more benefits from lowering corporate taxes. This has implications for U.S. corporate tax policy, as U.S. institutional infrastructure outside of the tax code is typically regarded favorably in the world economy.

Another important response to the corporate tax that has implications for employment and wages is how multinational firms choose where to locate their operations. Voget (2011)²⁰ examines the location decisions of multinational firms from 1997–2007 to determine how important corporate taxes are to cross-border relocation. They find that firms are quite responsive to the burden of home-country taxation when considering international relocation, and Voget estimates that for an increase in repatriation taxes of 10 percentage points in the home country, the share of multinational firms relocating abroad increases by 2.2 percentage points. Put another way, this change would increase the number of relocations by a third.

Hines (1996)²¹ examines the sensitivity foreign direct investment (FDI) in U.S. states to corporate tax policy. Although this is not a direct measurement of an employment effect, the International Trade Administration attributes 12 million U.S. jobs are attributable to FDI²², so the link between FDI and jobs is important. Hines shows that a state corporate tax rate difference of just one percent is associated with a difference of between 9 and 11 percent in the share of manufacturing capital owned by differently-taxed investors.

IV. Conclusion and Lessons for Federal Corporate Tax Reform

Although the context and technique of the studies examining the effects of the corporate income tax we cite in this paper are different--sometimes markedly so--*the balance of the literature shows a substantial negative effect of corporate taxes on labor- both through employment, wages, and the business location.* Studies with the most robust results that control for factors of influence outside of corporate income taxes generally have an elasticity of employment with respect to the corporate income tax rate of between -0.2 and -0.4, with a wage/income elasticity near -0.5. That is, for a 10 percent decrease in the corporate tax rate, the existing empirical literature shows an increase in employment between 2 and 4 percent, along with a 5 percent gain in wages.

²⁰ Voget, Johannes, 2011, "Relocation of Headquarters and International Taxation" *Journal of Public Economics* 95: 1067–1081.

²¹ Hines, James R., 1996. "Altered states: taxes and the location of foreign direct investment in America", *American Economic Review* 86, 1076–1094.

²² This estimate includes direct employment at foreign-owned firms, indirect and induced employment from foreign firms, and indirect and induced employment from productivity spillovers resulting from foreign-owned firms. The figure comes from the International Trade Administration publication, "Jobs Attributable to Foreign Direct Investment in the United States" (Richards and Schaefer, 2016). Richards, Julian and Elizabeth Schaefer, 2016, "Jobs Attributable to Foreign Direct Investment in the United States" *Industry and Analysis Economics Brief*, International Trade Administration.

In terms of applicability to potential federal changes to the corporate income tax, there are some caveats to consider. First, all empirical estimates are necessarily from a different time and place as the one where a new policy will be implemented. This calls into question how similar the current economic climate is to the climate (place, time, existing policies, industrial mix) when the studies we cite were completed. In terms of studies that examine corporate taxes internationally over time, this validity problem may be particularly severe—the U.S. has a particular set of laws, regulations, and workforce characteristics that are very different from other countries, all of which might make the effect of corporate income taxes on employment and wages more or less severe here than elsewhere.

Second, the U.S. has a different baseline than other countries that change corporate tax policy—having the highest top statutory corporate tax rate among developed nations and being the largest economy in the world may make the effects of corporate income taxes different here.

Third, it is unclear how other countries, U.S. state government policy, and our own federal reserve may react to federal corporate tax policy changes—any policy changes they enact as a response may serve to mute or exacerbate expected effects.

Finally, the state-level estimates we cite are all in the context of existing federal policy, and while there are considerable differences in state business climate, these differences pale in comparison to many international business climate differences. We think it is likely that the corporate income tax interacts with the general business climate, which may mean that changing the federal corporate income tax would do more to attract new firms from outside the U.S. (or slow the flow of corporate inversions) than any state change could, resulting in a larger effect on employment than state-level estimates suggest.

Although there is some uncertainty about how well existing empirical estimates would translate to any federal corporate income tax reduction, nearly all empirical studies suggest there would be some gains for labor from the change. This is highlighted by estimates of corporate tax incidence that suggest it is labor that pays for the majority of the corporate income tax.