The Efficiency-Equity Tradeoff of the Corporate Income Tax: Evidence from the Tax Cuts and Jobs Act

Patrick J. Kennedy
UCLA, NBER, and JCT

Christine L. Dobridge
Federal Reserve Board

Paul Landefeld
JCT

Jacob Mortenson
JCT

March 21, 2024

Abstract

We study the effects of the largest corporate income tax cut in U.S. history on firms and workers. To identify causal effects, we use employer-employee matched tax records and event studies comparing similarly sized firms in the same industry that faced divergent tax changes due to their pre-existing legal status. Tax cuts cause increases in sales, profits, investment, employment, and payrolls, with earnings gains concentrated among highly paid workers and executives. Interpreted through a stylized model, reducing corporate taxes by $1 generates $0.44 in additional output, with 80% of gains flowing to the top 10% of the income distribution.

Eric Heiser provided outstanding research assistance. We thank Alan Auerbach, Nano Barahona, Tom Barthold, David Card, Thorsten Drautzburg, Benjamin Faber, Pablo Fajgelbaum, Penelopi Goldberg, Jim Hines, Amit Khandelwal, Patrick Kline, Michael Love, Emi Nakamura, Cristóbal Otero, Jim Poterba, Andrés Rodríguez-Clare, Jesse Rothstein, Nina Roussille, Emmanuel Saez, Benjamin Schoefer, David Sraer, Jón Steinsson, Damián Vergara, Danny Yagan, Gabriel Zucman, and seminar participants at Berkeley, Brookings, Chicago Booth, Columbia, JCT, Michigan, MIT, Northwestern, UCLA, Yale, the 2022 NBER Conference on Business Taxation, the 2023 Conference on Applied Microeconomics in Rome, the 2023 NYU-UCLA-Berkeley Tax Policy Symposium, the 2023 Stanford Tax Seminar, the 2023 Women in System Economic Research Conference in Kansas City, and the 2023 National Tax Association Meetings in Denver for constructive comments and suggestions. This research embodies work undertaken for the staff of the Joint Committee on Taxation, but as members of both parties and both houses of Congress comprise the Joint Committee on Taxation, this work should not be construed to represent the position of any member of the Committee. The views and opinions expressed here are the authors own. They are not necessarily those of the Board of Governors of the Federal Reserve System, its members, or its staff. Corresponding author: patrick.kennedy@berkeley.edu

1 Introduction

We study the effects of corporate income taxes on firms and workers in the United States, where in 2017 Congress enacted the largest corporate tax cut in American history. Commonly known as the Tax Cuts and Jobs Act (TCJA), the legislation introduced sweeping changes to corporate tax rates, investment incentives, and taxation of foreign income, among several other provisions of the tax code. Collectively, these reforms constituted the first major overhaul of U.S. business taxation since the Tax Reform Act of 1986, providing a rare and sharp natural experiment to shed light on contemporary research and policy debates.

Even as governments around the globe have steadily reduced corporate income tax rates over the past half-century, policymakers and researchers today fiercely debate the costs and benefits of declining corporate tax burdens. Advocates for tax cuts argue that lower rates increase investment, growth, and workers' living standards, while opponents argue they do little to boost growth and primarily benefit the wealthy.

In this paper we bring new evidence to these debates. Our empirical analysis studies the core provisions of TCJA affecting firms' statutory marginal income tax rates, using a rich employer-employee matched panel dataset constructed from large random samples of confidential firm- and worker-level federal tax records. These data allow us to observe a holistic set of firm outcomes — such as sales, profits, shareholder payouts, and investment — and to merge them with worker-level data on employment and annual labor earnings.

Our main empirical strategy leverages an event study design to compare the outcomes of similarly sized firms in the same industry that faced divergent changes in their tax treatment. In particular, TCJA cut the top marginal tax rate for a legal entity type of firms known as C corporations from 35% to 21% (a 40% reduction). At the same time, TCJA cut the implied top marginal tax rate for a separate legal entity type of firms known as S corporations from 39.6% to 37% (about a 7% reduction), and also introduced a new tax deduction that, for many of these firms, further reduced the top marginal rate to 29.6% (for a cumulative 25% reduction).[1] C corporations and S corporations operate in the same industries, overlap in their firm size distributions, and faced broadly similar tax burdens prior to TCJA, inviting a natural comparison between the two.

We exploit that the average C corp received a significantly larger tax cut than the average S corp to study the effects of the corporate tax changes on firms' sales, profits, shareholder payouts, investment, and employment, as well as on workers' annual earnings. As in Yagan (2015), the identifying assumption of this research design is not random assignment of C or S status; rather, it is that outcomes for C and S corps would have trended similarly in the absence of the tax cuts. Event studies indicate that outcomes of comparable C and S corps were on similar trends prior to TCJA, and we implement extensive robustness checks to validate that the causal estimates are driven by changes in the tax rates rather than other features of the law, tax shifting behaviors, or unrelated shocks differentially affecting C and S corps at the same time as TCJA.

[1] As we will discuss, the top marginal tax rate for S corporations is *implied* because, unlike for C corporations, it must be computed as a weighted average of the marginal tax rates faced by each firms' individual owners and cannot be directly inferred from firms' tax records.

Event study analyses, which compare trends in outcomes of C versus S corps controlling for firm and industry-size-year fixed effects, indicate that corporate income tax cuts cause economically and statistically significant increases in firms' sales, profits, payouts to shareholders, employment, payrolls, and real investment in capital goods. Responses are concentrated in capital-intensive industries, and are not larger for cash-constrained firms, suggesting that effects are driven by a reduction in the cost of capital rather than by liquidity effects.

Our benchmark estimate of the federal corporate elasticity of taxable income, a key parameter for measuring the magnitude of tax distortions, is 0.46 (s.e.=0.11). This elasticity is smaller than most comparable estimates generated from variation in state and local corporate taxes, but larger than most estimates on personal income taxes. Since businesses are less mobile at the federal level than at the state or local level, and since a large literature documents that individual labor supply elasticities tend to be small, we interpret this evidence as consistent with the common economic intuition that tax distortions vary proportionally with factor mobility.

Moving to the evidence on workers, we study impacts on firm wage quantiles and show that annual earnings do not change for workers in the bottom 90% of the within-firm distribution, but do increase for workers in the top 10%, and increase particularly sharply for firm managers and executives. Executive pay increases are only weakly correlated with changes in firm sales, profits, or sales growth relative to other firms in the same industry, suggesting that these increases in compensation are not clearly linked to stronger firm performance.

To evaluate the effects of corporate tax cuts on tax revenue and output, we combine the reduced-form elasticities from the empirical analysis with a stylized model of firm owners and workers. Using the model, we estimate that a $1 marginal reduction in corporate tax revenue generates an additional $0.44 increase in output. Corporate tax revenues decline by $0.85, with behavioral responses of firms and workers modestly blunting mechanical revenue losses, and consistent with the notion that contemporary top corporate marginal income tax rates in the U.S. are below the revenue-maximizing rate.

To assess distributional impacts, we estimate the short-run incidence of corporate tax cuts on several factor groups — firm owners, executives, and high- and low-paid workers — as the share of total output gains accruing to each factor. Combining the reduced form elasticities with moments from the tax data, we find that 51% of gains flow to firm owners, 10% flow to executives, 38% flow to high-paid workers, and 0% flow to low-paid workers. We then go beyond factor incidence to estimate effects across the income distribution, accounting for the empirical fact that many workers are also firm owners (that is, they hold equity portfolios) and many firm owners also work. Using data on the distribution of capital ownership, we estimate that 80% of the gains from tax cuts accrue to the top 10% of earners and 20% of gains flow to the bottom 90%. Leveraging the empirically observable geographic distribution of workers and income, we further show that these benefits are disproportionately concentrated in the Northeastern and Western regions of the United States, particularly among workers in large and high-income cities.

This paper builds on a large body of research that studies the effects of corporate taxes on

profits, investment, shareholder payouts, employment, wages, and executive compensation.[2] Early seminal studies use aggregate or firm-level panel data and estimate two-way fixed effect models to study policy variation across countries or industries (Hassett and Hubbard 2002; Cummins et al. 1994, 1996; Hall and Jorgenson 1967). More recent contributions use detailed administrative microdata and modern econometric methods to exploit geographic policy variation (Link et al. 2024; Duan and Moon 2022; Garrett et al. 2020; Giroud and Rauh 2019; Fuest et al. 2018; Suárez Serrato and Zidar 2016, 2023), industry-level variation in exposure to tax deductions or credits (Curtis et al. 2021; Ohrn 2023; Dobridge et al. 2021; Ohrn 2018; Zwick and Mahon 2017; House and Shapiro 2008), and firm-level policy variation induced by plausibly arbitrary legal or circumstantial distinctions (e.g., Moon 2022; Carbonnier et al. 2022; Bachas and Soto 2021; Risch 2024; Alstadsæter et al. 2017; Patel et al. 2017; Yagan 2015; Devereux et al. 2014).

Despite advances in recent research, there are natural reasons to question whether existing evidence is generalizable to understanding the effects of corporate tax cuts in the context of TCJA. Evidence from subnational governments, small developing countries, or small firms may have limited applicability to major reforms in a large advanced economy such as the United States (Auerbach 2018). This concern is especially salient with respect to the U.S. federal corporate income tax, where the tax base is broader, top tax rates are higher, revenues are orders of magnitude larger, and factors of production are considerably less mobile. Moreover, economic theory predicts that alternate tax instruments — such as dividend taxes, capital gains taxes, or narrowly targeted deductions and credits — have very different effects than the corporate income tax (Auerbach 2002). In this light, it is not surprising that debates over the effects of TCJA remain hotly contested by researchers and policymakers (Barro and Furman 2018).

Empirical evidence on the effects of the federal corporate tax has remained scarce for three reasons. First, federal tax reforms are rare historical events, leaving limited policy variation for researchers to study. Second, administrative microdata was previously unavailable to researchers, constraining the scope and precision of empirical analyses. Third, even when countries do change their tax rates, it is difficult for researchers to establish credible counterfactuals for causal inference, particularly as the parallel trend assumptions underlying cross-country difference-in-difference analyses are challenging to defend in disparate socioeconomic and institutional settings.

This paper overcomes these limitations to provide extensive evidence on the effects of corporate tax cuts on firms and workers. In doing so, we make four main contributions.

First, we study a rare policy change that generated historically large within-country variation in federal corporate income tax rates, and moreover generated variation even across similarly sized firms in the same industry. As a share of GDP, the TCJA tax cut is orders of magnitude larger than previous studies that focus, for example, on changes in state or local corporate taxes, which

[2]Other outcomes in the literature include: establishment counts (e.g., Suárez Serrato and Zidar 2016; Giroud and Rauh 2019); consumer prices (Baker et al. 2020); innovation and the mobility of inventors (Akcigit et al. 2022); tax competition (Devereux et al. 2008); the location and investment decisions of multinationals (Becker et al. 2012); tax avoidance and profit shifting (Garcia-Bernardo et al. 2022; Desai and Dharmapala 2009; Auerbach and Slemrod 1997; Slemrod 1995; Hines and Rice 1994); and macroeconomic performance (Cloyne et al. 2022; Zidar 2019; Romer and Romer 2010). These outcomes are beyond the scope of this paper.

tend to have lower rates and a smaller tax base (e.g., Giroud and Rauh 2019; Fuest et al. 2018; Suárez Serrato and Zidar 2016). The large magnitude of the tax cut is relevant on both theoretical grounds (according to the conventional view that tax distortions are proportional to the square of the tax rate, as in Harberger 1964) and on purely empirical grounds (since ex-ante it is unclear whether existing evidence can be extrapolated to the case of an outlier).

Second, we complement the large shock with detailed employer-employee matched tax records that allow us to observe an unusually holistic set of firm- and worker-level outcomes. We build on frontier research that uses employee-level data to provide a nuanced account of corporate tax incidence on different types of workers (Carbonnier et al. 2022; Risch 2024; Dobridge et al. 2021; Fuest et al. 2018), and extend existing work by empirically estimating geospatial incidence and incidence on firm owners. In contrast to studies that do not directly observe profits (e.g., Suárez Serrato and Zidar 2016), the richness of the data allows us to estimate incidence using fewer assumptions than are typically required when data availability are more limited.

Third, we contribute to a growing literature that seeks to understand the effects of TCJA on the U.S. economy. Researchers have studied impacts on macroeconomic performance (Gale and Haldeman 2021; Gale et al. 2019; Kumar 2019; Barro and Furman 2018; Mertens 2018), international and intertemporal profit shifting (Albertus et al. 2023; Garcia-Bernardo et al. 2022; Dowd et al. 2020; Clausing 2020), pass-through businesses (Goodman et al. 2021), executive compensation (De Simone et al. 2022), capital structures (Carrizosa et al. 2023), and regional or local economic outcomes (Kennedy and Wheeler 2022). Our study differs from existing research in that we specifically study the effects of TCJA's marginal corporate income tax cuts on firm- and worker-level outcomes using rich administrative microdata and a quasi-experimental research design leveraging cross-firm policy variation. Contemporaneously, Chodorow-Reich et al. (2023) also use confidential tax records to study the effects of TCJA, with a primary focus on capital investment. We obtain very similar investment elasticities to theirs, even though we use a different identification strategy and a different sample of firms.

Finally, we contextualize our findings from this historical episode in debates about efficiency and equity in the broader tax and transfer system (Carbonnier et al. 2022; Bachas and Soto 2021; Risch 2024; Hendren and Sprung-Keyser 2020; Fuest et al. 2018; Suárez Serrato and Zidar 2016; Devereux et al. 2014; Arulampalam et al. 2012; Gruber and Rauh 2007). With respect to efficiency, our model-based estimates of the marginal output gains from cutting the federal corporate income tax are approximately 1.5 to 2 times as large as the literature-implied marginal gains from cutting personal income or payroll taxes. With respect to equity, our results contrast with much existing research in that we find the incidence of the corporate tax falls heavily on capital and highly paid workers. Assessing incidence across the income distribution, we estimate that corporate income tax cuts are similarly regressive relative to personal income tax cuts, but markedly less progressive than payroll tax cuts. We note that our results capture short-run responses and do not account for potential changes in government spending or after-tax redistribution, which are important considerations for policymakers but beyond the scope of this research.

2 The Tax Cuts and Jobs Act

2.1 Legislative History

In 2017 Congress reformed federal business tax policy, with the stated aims of increasing capital investment, economic growth, and international competitiveness. Following several months of political negotiations and policy proposals, in December 2017 Congress and the President enacted Public Law 115-97, more commonly known as the Tax Cuts and Jobs Act, or TCJA. Our aim below is not to exhaustively detail TCJA's numerous reforms — for reviews of significant provisions see Auerbach (2018) and Joint Committee on Taxation (2018) — but rather to illuminate the key institutional details and policy variation that we leverage in the empirical analysis.

2.2 C vs. S Corporations

At the heart of TCJA was an overhaul of the income tax schedules facing two legally distinctive types of businesses, known as C corporations and S corporations. Combined, C and S corps account for approximately 70% of total U.S. employment and 74% of total payrolls, with government, non-profits, and non-corporate private businesses comprising the remainder (Census Bureau 2019). Our analysis focuses exclusively on the corporate sector, as other entity types face different tax and regulatory regimes, and are beyond the scope of this paper. Below we describe salient differences between C and S corps.

C Corporations. C corps pay income taxes directly to the federal government, may be private or public, and are subject to both income taxes (paid on corporate profits) and dividend taxes (paid by shareholders on profits distributed as dividends). Before TCJA, C corps faced a progressive tax schedule with eight income brackets and a top rate of 35%. After TCJA, these brackets collapsed to a uniform 21% rate. Appendix A.1 documents the evolution of top marginal income tax rates for C corps in the United States since 1909, illustrating the historic nature of this large and rare tax cut. Appendix A.2 details the collapse of the progressive tax brackets following TCJA. Appendix A.3 puts the U.S. corporate tax cuts in a global perspective. Appendix A.4 benchmarks the magnitude of the TCJA corporate tax cut against other recent studies in the literature.

S Corporations. S corps do not pay taxes directly to the federal government. Rather, income is passed through to individual shareholders, who pay taxes on profits as ordinary income and can deduct losses. S corps may have up to 100 shareholders, all of whom must be U.S. citizens and not businesses or institutional investors, and are not permitted to sell shares on public exchanges. Unlike C corps, S corps do not face corporate income taxes, nor are their distributed profits subject to the dividend tax. Prior to 2018, owners of S corps faced a top marginal income tax rate of 39.6%. TJCA then provided two forms of tax relief to S corps owners. First, it reduced the top personal income tax rate from 39.6% to 37%. Second, it introduced a 20% tax deduction on qualified business income that further reduced the effective marginal tax rate on S corp income for most high-income taxpayers from 37% to 29.6%. This Qualified Business Income ("QBI") deduction is claimable by

many, but not all, owners of S corps. Since the QBI limitations are complex and not crucial for the empirical analysis, we abstract from details here and provide more information in Appendix A.5.

Entity Type Choice and Switching. The decision of firm owners to choose one corporate form over the other may reflect a variety of considerations, including shareholder preferences for concentrated versus diffuse ownership, access to capital, and tax planning. Switching entity types is costly, rare, and subject to regulatory restrictions. Thus, a firm's entity type prior to TCJA is strongly related to the tax rate change it faced after TCJA, and we will show evidence that endogenous switching is not a concern for our analysis.

2.3 Policy Variation in Marginal Income Tax Rates

Figure 1 shows the evolution of top marginal income tax rates for C and S corps in the years before and after TCJA, illustrating the key policy variation we exploit in the analysis. Panel A shows the sharp reduction in top statutory rates for C corps, as well as the change in implied top statutory rates for S corps depending on whether or not they are eligible for the QBI deduction. Panel B shows the change in observed marginal tax rates from our analysis sample of firms with at least 50 employees. Entity-level tax rates are estimated for S corps by linking to returns of their shareholders, as we will describe in the following section.

3 Data

We use a panel of employer-employee matched annual federal tax records from tax years 2013 to 2019. We begin the sample period in 2013, allowing us to compare trends in the outcomes of C and S corps several years before TCJA, and end the sample in 2019, prior to the onset of the COVID-19 pandemic.[3] Below we describe the data sources and sample construction, provide variable definitions, and present descriptive statistics. We provide additional details about the data and cleaning procedures in Appendix B.

3.1 Tax Returns

Corporate Returns. We study firms in the corporate Statistics of Income (SOI) files produced by the U.S. Internal Revenue Service (IRS). The corporate SOI files include stratified random samples of corporate tax returns from both C corps (from IRS Form 1120) and S corps (from IRS Form 1120-S). IRS produces and cleans these random samples to estimate aggregate statistics and to provide government agencies with essential data for development of legislation and policy analysis. The corporate tax returns allow us to observe firms' domestic sales, costs, profits, investment, and taxes paid, as well as their year of incorporation and industry.

[3] Evaluating outcomes prior to 2020 allows us to circumvent challenges related to assessing the external and internal validity of the research design during the unusual and severe pandemic recession, as well as issues related to post-2020 data quality and availability. It also allows us to contextualize our results with contemporaneous empirical studies of pre-pandemic outcomes (e.g., Chodorow-Reich et al. 2023). Our research is consistent with studies showing that fiscal policies may have economically and politically significant consequences even in the short run (e.g., Nordhaus 1975, Auerbach and Gorodnichenko 2012, Fajgelbaum et al. 2020).

We impose the following sample restrictions on the SOI panel, yielding an analysis sample of 15,490 unique firms and 108,430 distinct firm-year observations. First, we restrict the sample to large firms, defined as those with at least 50 employees and $1 million in sales in each year of our pre-treatment period from 2013 to 2016. These large firms account for the lion's share of corporate economic activity, comprising approximately 90% of corporate sales, 70% of corporate taxes, and 67% of corporate employment in 2016. In contrast to large firms, many small C corps faced tax increases (rather than tax cuts) after TCJA due to the flattening of corporate income tax brackets to a uniform 21% rate (Dobridge et al. 2023). The large firm restriction thus allows us to study the most economically significant firms and to employ a transparent research design that solely exploits variation in tax cuts. Second, we balance the panel and drop firms that ever switch entity types from C to S or from S to C over the course of our sample period. Balancing the panel ensures that our results are not driven by the changing composition of firms in the SOI samples. Dropping switchers from our sample excludes only approximately 4% of firms, which collectively comprise less than 0.5% of aggregate corporate sales or profits (see Appendix A.6).

Individual Returns. We merge the sample of corporate tax returns with the universe of worker-level filings of IRS Form W-2. We also collect information about the owners of S corps in our sample from the universe of filings of IRS Forms 1040 and 1099-K1.

3.2 Variable Definitions and Measurement

We take care to measure economic variables consistently over time, such that our outcomes are not affected, for example, by changes in the tax base or reporting requirements on tax forms. Additional details on variable definitions are provided in Appendix B.

Marginal Tax Rates. For C corps, we observe taxable income and infer marginal tax rates using the federal corporate income tax schedule reproduced in Appendix Table 1 Panel A. For S corps, we observe each owner's taxable income from their personal tax returns, and infer their tax rate using the federal personal income tax schedules reproduced in Appendix Table 1 Panel B. We then compute the implied marginal tax rate (MTR) for the firm as a weighted average of the marginal personal income tax rates faced by the firms' owners, where the weights are given by the share of ordinary business income distributed to each owner of that firm. For example, if an S corp has two owners who receive an equal share of that firm's business income, facing marginal tax rates on their individual income of 25% and 35%, respectively, then we compute the firm's implied marginal tax rate as $(.5 * .25) + (.5 * .35) = 30\%$. Appendix Figure 5 shows the sample distribution of corporate MTRs for both S and C corps before and after TCJA.

Taxes Paid. For C corps, we observe federal tax payments on Form 1120. For S corps, we estimate tax payments using information from the individual owners' tax returns. To do so, we first compute each owner's average tax rate from Form 1040 as total federal tax divided by taxable income. We also record each owner's total net ordinary business income from Form 1040 Schedule E, and estimate total business taxes paid on this income by multiplying it by the owner's average

tax rate. We bottom code total business taxes at zero, ensuring in our calculations that owners do not pay tax on business losses. For each owner, we allocate her total business tax payments to each firm that she owns in proportion to the share of ordinary business income received from that business. Finally, we sum the tax payments of each firm's owners to record an estimate of firm-level tax payments. Appendix B provides additional details about these computations.

Sales, Costs, and Profits. Sales are gross receipts. Pre-tax profits are sales minus cost of goods sold, which includes both material and labor inputs. This profit measure is transparent, consistent over time, and invariant to tax law and corporate form. As a robustness check, we also construct a pre-tax net income measure harmonized over time and across entity types, described in Appendix B. After-tax profits are pre-tax profits minus taxes paid.

Dividends, Share Buybacks, and Total Payouts. Dividends are total cash and property payments to shareholders. Share buybacks are equal to non-negative changes in treasury stock, and total payouts are measured as the sum of dividends and share buybacks.

Investment. Net investment is the change in the dollar value of capital assets, where capital assets are equal to the book value of tangible investment minus capital asset retirements and accumulated book depreciation. We also report results on new investment, defined as the sum of capital expenditures reported on IRS Form 4562.

Labor Market Outcomes. Employment is the number of individuals with a W-2 issued by the firm. We use crosswalks to improve linkages between parent companies and their subsidiaries (Joint Committee on Taxation 2022). Workers' annual earnings are equal to Medicare wages from the W-2. Payrolls are the sum of workers' annual earnings. Employment, earnings, and payrolls are strictly positive, and so we take logs of these outcomes in the empirical analyses. We measure executive compensation as the earnings of the top five highest paid workers in the firm.

Additional Firm Characteristics. We group firms into five time-invariant size bins with approximately similar numbers of firms based on their average employment in the pre-period years prior to 2017, where the bins are: 50-99 employees; 100-199 employees; 200-499 employees; 500-999 employees; and 1000+ employees. We also classify firms into time-variant industries using the NAICS-3 codes they report on Forms 1120 and 1120-S. In the resulting data we observe 75 distinct industries and 339 distinct industry-size bins. Firm age is inferred from the firm's year of incorporation, reported on the 1120. Firms are classified as multinationals if their foreign sales share is greater than 1%, where foreign sales are defined as the sum of gross receipts from all Controlled Foreign Corporations (that is, foreign subsidiaries) reported on Form 5471. We measure capital intensity at the industry level as capital assets divided by sales. Firms are classified as capital intensive if the mean of this ratio in the pre-period is greater than the sample median, and others are classified as non-capital intensive.

Measurement. We scale several outcomes — taxes, sales, costs, and profits — by firm sales in

2016, our baseline year prior to the passage of TCJA. While it is common in economic research to estimate elasticities by transforming regression outcomes using logs, doing so in our case is problematic because taxes, profits and investment are often zero or negative. Scaling firm variables by baseline sales permits a natural interpretation of the regression coefficients in our empirical analyses, allows us to study a range of outcomes such that they can be consistently and easily compared, and is standard in the literature. In accordance with economic theory and prior research, our preferred investment measure is net investment scaled by lagged capital, although for consistency we also report results scaled by baseline sales. We winsorize the top and bottom 0.1% of the scaled outcomes separately for C and S corps in each year to ensure that the results are not driven by outliers or measurement error, and to improve statistical precision. We also show that the empirical results are robust to alternate winsorizing thresholds.

3.3 Descriptive Statistics

Panels A and B of Figure 2 show the distributions of log firm sales and log firm employment in our sample, and illustrate broad overlap in the size distributions of C and S corps. The panels make clear that the firm size distributions are strongly right-skewed, and that this skewness is more pronounced for C corps than S corps. In robustness checks, we show that our empirical results are insensitive to the exclusion of very large C corps.

Panel C of Figure 2 shows the NAICS-2 industry composition of the sample, again revealing broad overlap of C and S corps. Most industries have comparable shares of C and S corps. Some sectors, such as management and professional services, have a higher proportion of C than S corps, while the reverse is true for others, such as construction and retail trade. Because the event study analyses will use industry-size-year fixed effects to compare C and S corps in the same industry and employment size bin, the observed sectoral overlap in the sample is sufficient for the empirical design. In robustness checks, we show the results are insensitive to the exclusion of industries in which the firm share of C corps or S corps exceeds 80%, and to reweighting the sample so that the industry-size bin distribution of S corps exactly matches the distribution of C corps.

Table 1 presents descriptive statistics for our analysis sample from 2016. The mean firm in the sample pays $13.0 million in federal taxes, has annual sales of $686.5 million, and makes new real investments of $31.6 million per year. Mean firm employment is 2,309 workers, and the average worker earns approximately $64,700 per year. Consistent with Figure 2, columns 3-10 underscore the right-skewness of firm size, especially of C corps, such that mean outcomes are significantly higher than medians and outcomes for C corps are higher and more variable than for S corps.

4 Empirical Analysis

4.1 Empirical Strategy

We implement a research design comparing trends in outcomes of C and S corps in the same industry-size bin before and after TCJA. The event study specification is given by:

$$y_{ft} = \sum_{t \neq 2016} \beta_t C_f * \mathbf{1}(year = t) + \gamma_f + \alpha_{is(f),t} + \epsilon_{ft} \tag{1}$$

where y_{ft} is an outcome for firm f in year t; C_f is a binary variable equal to 1 if firm f is a C corp or 0 if it is an S corp; γ_f is a firm fixed effect; and $\alpha_{is(f),t}$ is an industry-size-year fixed effect. The coefficients of interest, β_t, capture the average differences in outcomes between C and S corps in the same industry-size bin in year t. We set 2016 as the reference year, allowing us to compare C and S corp trends for several years prior to TCJA and also to observe any potential anticipatory tax-shifting behaviors beginning in 2017. Standard errors are clustered by firm.

The identifying assumptions permitting a causal interpretation of the β_t coefficients are that the outcomes of C and S corps would have trended similarly in the absence of TCJA's changes to firms' marginal income tax rates, and that C and S corps respond similarly to changes in their marginal income tax rates. While these assumptions are not directly empirically testable, there are several reasons they are likely to hold in this setting.

First, legislative passage of TCJA was widely unexpected prior to the 2016 federal elections, and so firms had limited scope to anticipate the reform and to adjust their behavior endogenously prior to the policy changes. Second, the industry-size-year fixed effects imply that we make comparisons among C and S corps that compete in similar product markets and are subject to the same industry-by-size-specific supply and demand shocks.[4] Third, Yagan (2015) documents that C and S corp trends in real outcomes were statistically indistinguishable for all years in his sample period from 1996-2008, implying that C and S corps have historically responded similarly to economic shocks and trends. Fourth, in our own sample period, the event studies corroboratively exhibit parallel trends in the key outcomes of C and S corps in the years prior to the policy reform. Lastly, in Section 4.8, we carefully consider additional identification threats, and present robustness checks to ensure that the causal estimates are not driven by non-MTR features of the law, anticipation effects, tax-shifting behaviors, unrelated economic shocks occuring at the same time as TCJA, or differences in industry-size composition or other firm characteristics.

Our goal of quantifying the market distortions and distributional effects of TCJA's corporate tax cuts will require elasticities of profits, investment, and earnings with respect to the net-of-tax rate. To estimate these key elasticities, we pool outcomes in the post-period and use two-stage least squares. The reduced form, first stage, and structural equations are given, respectively, by:

$$y_{ft} = \beta C_f * Post_t + \gamma_f + \alpha_{is(f),t} + \epsilon_{ft} \tag{2}$$

$$\Delta \ln(1 - \tau_f) * Post_t = \delta C_f * Post_t + \gamma_f + \alpha_{is(f),t} + \epsilon_{ft} \tag{3}$$

$$y_{ft} = \varepsilon \Delta \ln(1 - \tau_f) * Post_t + \gamma_f + \alpha_{is(f),t} + \epsilon_{ft} \tag{4}$$

[4]Similar to several related studies in the empirical literature, the difference-in-differences design does not allow us to identify market-level adjustments and general equilibrium effects that may be absorbed by the time fixed effects (e.g., as in Yagan 2015; Fuest et al. 2018; Giroud and Rauh 2019; Moon 2022; Link et al. 2024). A related concern in our setting is that gains in the post-TCJA period for C corps could in principle be offset by mirror-image losses for S corps — a possible form of SUTVA violation. We examine these issues in greater detail in Section 4.8.

where $\Delta \ln(1-\tau_f)$ is the 2016 to 2019 log change in the net-of-tax rate for firm f, $Post_t$ is an indicator equal to 1 for years $\geq$2018, and the fixed effects are the same as in equation 1. Intuitively, we instrument for firms' net-of-tax change using their pre-existing entity type status as C or S corps. The identifying assumptions underlying this empirical strategy are well known: exogeneity, relevance, monotonicity, and exclusion. We do not claim strict exogeneity in our setting — that is, we do not claim random assignment of C or S status — but rather rely on the weaker claim of parallel trends in the outcome absent the changes in the tax rate (Conley et al. 2012). We examine the relevance and monotonicity conditions below, and return to a discussion of the exclusion restriction when we evaluate mechanisms.

We begin the empirical analysis with a presentation of average responses, and then turn to heterogeneity tests and robustness checks. We conclude the empirical analysis with a discussion of mechanisms, where the focus is naturally related to the task of disentangling the impacts of TCJA's marginal tax rate cuts from other concurrent policy changes. First, however, our goal is more modest: to provide clear evidence on how TCJA differentially affected C and S corps.

4.2 Marginal Tax Rates and Taxes Paid

Figure 3 plots the β_t coefficients and 95% confidence intervals from estimating equation 1, using the firms' marginal tax rates and taxes paid as outcomes. The grey lines indicate the average of the coefficients before and after TCJA, and below each panel we report the difference-in-difference coefficient and standard error estimated from equation 2.

Panel A of Figure 3 shows that the observed marginal tax rates of C and S corps trended similarly prior to TCJA, but diverged sharply thereafter. On average, the marginal tax rate of C corps fell by approximately 5.0 percentage points (s.e.=0.2) compared to S corps in the sample. The panel also shows that firms' tax rates started to decline modestly in 2017, even though the bulk of TCJA's provisions did not take effect until 2018. This pattern provides suggestive evidence that firms engaged in intertemporal shifting behaviors to minimize tax liability, such as reporting costs in 2017 rather than 2018 so that those business expenses could be deducted at a higher tax rate. We discuss shifting behaviors in greater detail later in Section 4.8.

Panel B of Figure 3 shows an analogous version of Panel A, where the outcome is transformed as the log net-of-tax rate, $\ln(1-\tau_f^{MTR})$. Economic theory predicts that firms respond to the net-of-tax rate when optimizing profits. The figure shows that, on average, C corps saw their net-of-tax rate increase by approximately 6.6% (s.e.=0.2) relative to S corps following TCJA. Below, we use this result to scale other reduced form effects, allowing us to estimate elasticities of key outcomes with respect to changes in the log net-of-tax rate.

Panel C of Figure 3 shows that the differences in tax cuts also translated into differences in taxes paid, with C corps paying approximately 1.0 percentage point (s.e.=0.2) less in federal tax in 2019 relative to their baseline sales when compared to S corps. Panel D illustrates that the magnitude of this effect is economically large: on average, C corps paid approximately \$2,100 (s.e.=341) less in tax per worker than comparable S corps following TCJA.

Columns 1 to 4 of Table 2 report the $C \times Post$ estimates produced from equation 2. Similar

to the event studies, these coefficients capture the average differences between C and S corps in the pre- and post-periods for each outcome after controlling for firm and industry-size-year fixed effects. Overall, the results in Figure 3 and Table 2 provide evidence of a strong first stage, demonstrating an economically and statistically powerful differential effect of TCJA on the tax rates and tax payments of C versus S corps. These results also indicate that the relevance and monotonicity assumptions underlying equation 3 are satisfied in this setting.

4.3 Sales, Costs, and Pre-Tax Profits

Figure 4 plots the β_t coefficients from equation 1 to assess trends in the sales, costs, and pre-tax profits of C and S corps over time. Trends in these outcomes were statistically similar before TCJA, again lending support to the underlying parallel trends assumption. After TCJA, however, C corps' sales increased relative to S corps by 3.9 percentage points (s.e.=1.2). The effect is precisely estimated and economically significant: using values from Table 1, the coefficient implies that the median C corp increased its annual sales by about $3.7 million relative to comparable S corps.

C corps also faced higher costs, as shown in Panel B, although the magnitude of the cost increase is smaller than for sales and is not statistically significant. Later we show evidence that the increase in costs is corroborated by statistically significant changes in real outcomes, including payrolls and capital investment.

Given sharply increasing sales and modestly increasing costs, Panel C shows that the average pre-tax profits of C corps also increased relative to S corps, by 3.0 percentage points (s.e.=0.7). Panel D shows an alternate measure of pre-tax profits, using the harmonized net income measure, and again reveals a clear increase in the profits of C corps relative to S corps. These results provide initial evidence that firms expanded in response to tax cuts, consistent with the standard notion that taxes induce economic distortions and may generate market deadweight loss.

Columns 1 to 3 of Table 3 show the $C \times Post$ coefficients associated with the event studies in Figure 4. In column 4, we estimate the elasticity of pre-tax profits with respect to the net-of-tax rate using equation 4. Scaling the reduced form estimate in column 3 by the first-stage estimate from column 2 of Table 2 yields an approximate elasticity of 0.46 (s.e.= 0.11).

As shown by Feldstein (1999) and reviewed by Saez, Slemrod, and Giertz (2012), under plausible assumptions the elasticity of taxable income (ETI) can be used to estimate the welfare impacts and efficiency costs of tax changes. In general, a larger ETI implies greater deadweight loss, since it implies a larger distortion of economic activity due to the tax.

Our estimate of the corporate ETI, 0.46, is on the lower end of estimates identified from policy variation in small open economies. For example, Giroud and Rauh (2019) estimate an elasticity of establishment growth (a proxy for the tax base) of approximately 0.50 with respect to state corporate taxes in the United States; Suárez Serrato and Zidar (2016) estimate an elasticity of establishment growth of approximately 0.9 for U.S. state corporate taxes within two years after a tax cut; and Bachas and Soto (2021) estimate large taxable income elasticities of 3.0-5.0 for small firms in Costa Rica. On the other hand, our estimate of the corporate ETI is on the higher end of most existing estimates of the ETI for personal incomes, which Saez, Slemrod, and Giertz (2012)

find in a literature review ranges from approximately 0.14 to 0.40, with a central estimate of 0.25.

Viewed in the context of other research, we view our corporate ETI estimate as consistent with the common economic intuition that tax distortions vary with factor mobility. Firms and workers are less mobile at the federal level than at the state and local level, mitigating distortions from the federal corporate tax relative to the state and local corporate tax. However, many forms of capital are more mobile relative to workers (Kotlikoff and Summers 1987), suggesting that federal taxes on labor income, the primary source of personal income tax revenue, may be less distortative than the federal corporate tax. In Section 4.8 we perform robustness checks on our ETI estimate, and in Section 6 we discuss its significance in the context of the broader national tax and transfer system.

4.4 After-Tax Profits and Shareholder Payouts

Next we evaluate trends in firms' after-tax profits and payouts to shareholders. Panel A of Figure 5 and Column 1 of Table 4 show that the after-tax profits of C corps increased relative to S corps following TCJA, by 4.0 percentage points (s.e.=0.7). The magnitude of this effect is economically and statistically significant, and underscores that tax cuts are lucrative to firm owners. The elasticity of after-tax profits with respect to the net-of-tax rate, estimated in column 4 of Table 4 using equation 4, is approximately 0.61 (s.e.= 0.11). Later, we use this elasticity to assess the incidence of TCJA's tax cuts on firm owners.

We also find that firms returned some of these excess profits to their shareholders via dividends and share buybacks, the sum of which we refer to as total shareholders payouts. Because shareholder payouts are infrequent events, we study both the intensive and extensive margins. In Panel B of Figure 5 the outcome is log total payouts (the intensive margin). The figure shows that payouts of C corps relative to S corps increased by 21.9% (s.e.=2.9). The outcome in Panel C is equal to one if total payouts are greater than zero (the extensive margin), and shows an increase of 3.0 percentage points (s.e.=0.5) in the payout probability of C corps relative to S corps. Consistent with this increase in shareholder payouts, in Appendix C.1 we find that C corps do not increase their issuance of equity or debt relative to S corps after TCJA.[5]

Overall, the results from Figure 5 and Table 4 provide clear evidence that firm owners bear a substantial portion of the short-run economic incidence of the corporate income tax.

4.5 Labor Market Outcomes

We again use equation 1 to examine the labor market outcomes of workers at C and S corps before and after TCJA. Figure 6 shows the results from estimating equation 1 to assess trends in log employment, payrolls, and annual earnings for selected groups of workers.

Figure 6 shows that the labor market outcomes of C and S corps followed similar trends prior to TCJA. After TCJA, Panel A shows that employment in C corps increased relative to S corps, by 2.3% (s.e.=0.8) on average. Payrolls, shown in Panel B, also trend upward, by 3.4% (s.e.=0.8).

[5]The results are consistent because, if firms need external financing to fund operations, they generally do not simultaneously distribute cash to shareholders. We also find that the results on shareholder payouts are robust to inclusion of controls for foreign earnings as well as the exclusion of multinational firms, implying that the concurrent repatriation tax holiday is not the primary driver of these findings.

Panels C, D, and E move beyond total payrolls to shed light on the distributional impacts of TCJA on workers' earnings. Panel C shows that the earnings of the median worker at the firm evolved similarly for both C and S corps over the entire sample period, and implies that corporate tax cuts did not have a statistically significant effect on earnings for the typical worker.[6] By contrast, Panel D shows that the earnings of C corp workers at the 95th centile increased sharply relative to their counterparts in S corps, and Panel E indicates that earnings of executives (as proxied by the top five highest paid workers) increase even more. That executive earnings appear to trend upward in 2017, before TCJA fully took effect, is consistent with firms intertemporally shifting forward executive compensation, perhaps in the form of bonuses, so that these costs could be deducted at a higher tax rate prior to the corporate rate cut beginning in 2018.[7]

To more comprehensively evaluate the effects of TCJA on the distribution of workers' earnings, we estimate specifications of equation 2 where the outcome $y_{ft}(q)$ is log annual earnings of workers in firm f and year t at quantile q. For example, $y_{ft}(q = 50)$ uses log median earnings as the outcome, as shown in Panel C of Figure 6, and $y_{ft}(q = 95)$ uses the 95th percentile of log worker earnings as the outcome, as in Panel D.

Figure 7 plots the $C \times Post$ coefficients from these regressions along with their corresponding 95% confidence intervals. The figure shows that the relative earnings of workers in C and S corps below the 90th percentile are statistically indistinguishable following TCJA; we cannot reject that the coefficients are statistically different from zero. However, the figure reveals a very different pattern for workers in the top 10% of the earnings distribution. On average, workers at the 90th percentile of the within-firm distribution see their relative earnings change by 0.5% (s.e.=0.4), and these impacts grow quantitatively larger and statistically sharper further up the distribution. At the 95th percentile, we estimate a relative earnings increase of 1.3% (s.e.=0.4) for C corp workers, and this magnitude climbs to 4.8% (s.e.=0.7) at the 99th percentile.

Panel A of Table 5 reports the $C \times Post$ coefficients obtained from estimating equation 2, as well as the dependent variable means in the baseline year and implied elasticities with respect to the net-of-tax rate from equation 4. For workers at the 95th percentile, we estimate an earnings elasticity of 0.20 (s.e.=0.06), and for executives we estimate a larger earnings elasticity of 0.73 (s.e.=0.11). The mean baseline earnings of these workers and executives are high: the average worker in the sample at the 95th percentile of the within-firm distribution earns $175,757 per year, and the average worker in the top five earns $951,309 per year. Applying the baseline sample levels, the average firm net-of-tax-rate change in the sample, and the estimated net-of-tax elasticity, the results imply that average executive earnings increased by approximately $46,000 per year. Similar computations yield that average earnings for workers at the 95th percentile increased by approximately $2,000 per year, while gains for workers below the 90th percentile are statistically indistinguishable from zero.

[6] Models of perfect labor competition predict that, in response to increased labor demand, wages increase equally for workers of both C and S corps. It is possible that these general equilibrium effects are absorbed in our industry-size-year fixed effects. We discuss strategies for evaluating general equilibrium effects of the tax cuts in Section 4.8.

[7] Hanlon et al. (2019) document sharp increases in firm bonus announcements in 2017 after the tax cut.

What drives the sharp rise in executive pay? The coinciding increases in the sales, pre-tax and after-tax profits, and payrolls of C corps relative to S corps suggest there is plausible scope for managerial decision making and effort to drive increased firm productivity. Moreover, firms may incentivize managerial effort by explicitly compensating executives on the basis of firm performance metrics (e.g., Bebchuk and Fried 2003; Murphy 1999; Jensen and Murphy 1990). On the other hand, to the extent that executives have significant bargaining power vis-a-vis shareholders, they may be in a position to extract a portion of after-tax profits even in the absence of improvements in managerial productivity.

In Panel B of Table 5 we perform a series of empirical tests developed by Ohrn (2023) to evaluate the relevance of these mechanisms, which are not necessarily mutually exclusive. The outcome in all columns is log executive compensation. The first column shows the benchmark specification given by equation 2. In the remaining columns, we respectively add controls for three measures of firm performance: sales growth, profit growth, and sales growth relative to other firms in the same industry. To the extent that executive pay is correlated with these performance metrics, we may expect the $C \times Post$ coefficient to shrink as we add the controls. The results in columns 2-4 show that the $C \times Post$ coefficient on executive pay shrinks only modestly as we add controls for the firm performance metrics. The benchmark estimate of 4.8% declines only very modestly to 4.5% when we add controls for sales growth, and shrinks by a similar amount when controlling for profit growth or sales growth relative to other firms in the same industry.

In Panel C, we estimate changes in average log earnings separately for all workers, incumbent workers, and new hires. If earnings increases are driven by changes in productivity, we may expect the price of the marginal unit of labor (e.g., new hires) to increase, while if increases are driven purely by rent-sharing, we would expect gains to be concentrated only among incumbent workers. Empirically, the results show clearly that earnings gains are driven entirely by gains for incumbents in the firm, consistent with a rent-sharing mechanism.[8] However, we caution that these tests are suggestive rather than dispositive: the econometric problems with conditioning on post-treatment outcomes are well-known (e.g., Imbens 2020), the relevant marginal unit of labor may be hours or effort (which we do not observe) rather than new workers, and increasing managerial productivity may not be fully reflected in firm performance metrics over the two-year sample horizon.

To provide additional insight into the distributional impacts of corporate tax cuts on workers' earnings, Panel D of Table 5 presents descriptive statistics on the individual characteristics of workers in the bottom 90% of the firm wage distribution, in the top 10% of the firm wage distribution, and in top five highest paid workers at the firm. In our sample, 88% of executives are men, and on average these workers are 54 years old and earn approximately $950,000 in annual labor income. By contrast, just 55% of workers in the bottom 90% of the distribution are men, and these workers on average are 39 years old and earn less than $40,000 in annual labor income. In light of the above evidence, the table underscores that the distributional impacts of corporate tax cuts do not affect all demographic groups equally.

[8]The results for incumbents also imply that the estimated effects on the within-firm earnings distribution are not driven by changes in the composition of workers.

Collectively, these results are consistent with studies finding evidence of rent-sharing with high-income workers and incumbents in response to tax or productivity shocks (Ohrn 2023; Carbonnier et al. 2022; Dobridge et al. 2021; Kline et al. 2019), and are also consistent with Risch (2024), who finds that the incidence of tax hikes on S corps falls mostly on shareholders and high-income workers in the firm. By contrast, our results differ modestly from Fuest et al. (2018), who study municipal corporate tax changes in Germany and find that the incidence of business tax hikes falls substantially on low-skilled and marginally attached workers.[9]

Overall, the labor market findings suggest that the short-run effects of corporate tax cuts are regressive, increasing earnings only for workers at the top of the within-firm earnings distribution. We return to the task of assessing the incidence of the corporate tax cuts in Section 5.

4.6 Investment

Figure 8 shows the results from estimating equation 1 to assess relative trends in real net investment of C and S corps. Panel A shows trends in the investment rate, defined as net investment scaled by the lagged capital stock. We find that C corps increase net investment by 2.9% (s.e.=0.4) relative to S corps after TCJA, with effects concentrated in 2019.

The investment elasticity may have implications for economic growth (Romer and Romer 2010), and for evaluating the incidence of the corporate tax (Goolsbee 1998). Column 1 of Table 6 reports the results from estimating equation 2 on net investment, and for consistency with other outcomes, in column 2 we report results scaled by baseline sales. In column 3 we estimate equation 4 and obtain an investment elasticity of 0.45 (s.e.=0.07).[10]

We report additional results on new investment, corresponding to new purchases reported by firms on IRS Form 4562, in the Appendix. Appendix Table 4 shows relative increases in short-life new investment (such as computers), but no change in long-life new investment (such as heavy machinery) or structures. It is possible that long-life investments face higher adjustment costs, and may materialize over a longer time horizon.

Later, we discuss how firms respond to the cost of capital. Before doing so, however, we must first investigate whether changes in investment are driven by changes in the cost of capital, as in a standard model, or by other channels such as liquidity effects. We thus now implement a battery of heterogeneity and robustness tests, and then turn to an explicit discussion of mechanisms.

4.7 Heterogeneity

Figure 9 presents variation in key elasticities across several dimensions of firm heterogeneity, focusing pre- and post-tax profits, workers' earnings, and net investment. We focus on these

[9] Our results are similar to Fuest et al. (2018) in that we will find in Section 5, as they do, that approximately half of the incidence of the corporate tax is borne by firm owners, and half by workers. Our results differ, however, in our finding that high-income workers, rather than low-income workers, bear the incidence. A possible explanation for this difference, discussed in their study, is that the labor incidence of corporate tax hikes and tax cuts may be asymmetric. Another possible reconciliation is that their findings are driven by workers in small firms, whom they argue may be relatively immobile in Germany and thus bear a larger share of the incidence.

[10] Chodorow-Reich et al. (2023) study firms' investment responses to TCJA and estimate a domestic tax term elasticity of 0.52. We estimate a very similar elasticity despite using a different empirical strategy and sample of firms.

outcomes due to their usefulness in interpreting mechanisms and due to their central role in our quantification of welfare and incidence in Section 5.

Existing research argues that the effects of tax changes may vary with firm size (if smaller firms are more adept at tax shifting, as in Giroud and Rauh 2019); by liquidity (where low-cash firms may face borrowing constraints, as in Zwick and Mahon 2017 and Saez et al. 2019); by factor intensity (where capital-intensive firms may be most responsive, as in Acemoglu and Guerrieri 2008); by firm profitability (where highly profitable firms may be managed more effectively, as in Bloom and Van Reenen 2007); by unionization rates (where unionized firms may reduce firms' investment, as studied in Card et al. 2014); and by industry concentration (where concentrated industries may be better able to pass costs to their input suppliers, as in Fuest et al. 2018 and Juarez 2022).

We focus on heterogeneity by firm size, liquidity, and capital intensity, and report additional results in Appendix Figure 8. We measure firm size using pre-TCJA employment bins. Cash is the sum of the firm's liquid assets, and firms are high-cash if their average pre-TCJA cash-to-assets ratio is greater than the sample median. Capital intensity is defined as in Section 3.2. When we test for heterogeneity by firm size we include only industry-year fixed effects in the regression specifications; for all other specifications we include industry-size-year fixed effects. To obtain the point estimates in Figure 9, we estimate equation 4 separately for each subsample of firms.

Across the outcomes in Figure 9, we observe no clear patterns in profits, median earnings, or investment with respect to firm size, although there is suggestive evidence that gains for high-income workers are larger in smaller firms. With respect to liquidity, the results suggest that high cash firms are if anything *more* responsive than low-cash firms in our sample, implying that liquidity constraints are unlikely to drive the responses. These results contrast with Zwick and Mahon (2017), who find that small and financially-constrained firms are most likely to increase investment and payrolls in response to bonus depreciation incentives.

Several factors may explain why our findings differ from Zwick and Mahon (2017). First, Zwick and Mahon study policies enacted during U.S. recessions, when financial constraints are most likely to be binding. By contrast, TCJA was enacted during a long macroeconomic expansion with low interest rates and favorable financial conditions. Second, Zwick and Mahon find that responses are largest for the smallest firms in their sample. By contrast, our sample includes only medium-to-large firms. Finally, Zwick and Mahon use an identification strategy that exploits cross-industry exposure to bonus depreciation incentives. By contrast, our identification strategy exploits within-industry variation in tax policy, and as such our industry-size-year fixed effects may absorb any time-varying policy impacts that affect both C and S corps similarly.

Although firms' responses do not appear to vary predictably with firm size or liquidity, Figure 9 shows that they do appear to vary with capital intensity. C corps in capital-intensive industries are more likely than S corps to increase their profits and investment in the years following TCJA, and these differences are both economically and statistically significant. These findings are suggestive of a cost of capital channel, which we explore in greater detail in Section 5.

4.8 Robustness

Alternate Specifications. Row 1 of Table 7 reports the key net-of-tax elasticities obtained from estimating equation 1 using our benchmark specification. We focus on the outcomes that will serve as key inputs in our analyses of welfare, incidence, and mechanisms: tax rates, pre- and after-tax profits; the earnings of low- and high-paid workers and executives; and net investment. In the remaining rows, we examine the sensitivity of these estimates to alternate modeling choices. All specifications include firm and industry-size-year fixed effects.

Row 2 controls for firm age with cohort-by-year fixed effects, where cohorts are defined using the firms' year of incorporation. Row 3 adds controls for state-by-year fixed effects, where a firm's state is defined using the address reported on Form 1120 or 1120-S. Row 4 controls for pretrends, interacting the 2013-2016 firm-specific trend in the outcome with year indicators. Row 5 defines industries using 6-digit, rather than 3-digit, NAICS codes. Row 6 reweights the sample so that the industry-size bin distribution of S corps exactly matches the distribution of C corps. Row 7 uses an inverse propensity score (IPW) estimator, where we construct the propensity score using a probit model to predict C corp status in the pre-period as a function of log sales, log employment, log payroll, the net investment rate, and indicators for multinationals and industries. Row 8 uses a log transformation of the outcome. Row 9 winsorizes the outcomes at the 5th and 95th percentiles. Row 10 weights observations by each firm's 2016 sales (and for labor market outcomes, by the 2016 payroll). In general, the elasticity estimates across all specifications and outcomes are stable and within the confidence interval of the benchmark specification.

Alternate Samples. Table 8 shows robustness results for the same outcomes using alternate samples. Row 2 excludes firms with 2016 sales greater than $1 billion or 2016 employment greater than 10,000. This sample restriction excludes C corps that are larger than the largest S corps. Row 3 excludes "mismatched" industries, defined as those in which C corps account for greater than 80% or less than 20% of the firms in the sample. Row 4 excludes manufacturing firms, which may have been affected, for example, by the 2018-2019 U.S.-China trade war. Row 5 uses the unbalanced panel, and Row 6 excludes public firms. Although there is some modest variation in the estimates across the samples, the magnitudes are broadly within the confidence intervals of the benchmark results in row 1. We account for parameter uncertainty in the aggregate analysis in Section 5.

Other Provisions of TCJA. We summarize the major concurrent provisions of TCJA affecting corporations in Appendix A.7. Ex-ante, it may seem unlikely that other provisions of TCJA would drive our results, for two reasons. First, because TCJA's other policy changes applied to both C and S corps, our difference-in-difference design implicitly controls for them to the extent that C and S corps were similarly affected. Second, the legislative budget scoring report by the Congressional Joint Committee on Taxation (2017) projected that the rate cuts would do far more than any other business tax provision of TCJA to reduce tax liabilities, making those rate cuts natural suspects.

Nevertheless, these considerations do not rule out that interactions with other TCJA provisions may affect the estimates. To assess sensitivity to concurrent policies, in rows 7 to 11 of Table 8 we

implement additional tests in which we exclude firms most likely to be affected by other provisions of TCJA. In row 7, we exclude firms in industries most likely to claim the DPAD deduction, defined as those where the share of firms claiming the deduction is above the pre-period median. In row 8, we similarly define and exclude industries where firms were most likely to claim the NOL deduction (row 8) and the interest limitation deduction (row 9). In row 10, we exclude firms in industries most exposed to changes in bonus depreciation, and in row 11 we exclude multinationals. While we cannot rule out modest interactions with concurrent policy changes, across samples the elasticities remain within the confidence intervals of the benchmark estimates.

Profit Shifting, Evasion, and Anticipation. The exclusion of multinational firms in row 11 indicates that our results are not primarily driven by international profit shifting. Row 12 of Table 8 excludes tax years 2017 and 2018 from the estimation, which are the years most likely to be affected by anticipation effects or intertemporal profit shifting (Dowd et al. 2020). Row 13 excludes S-corps with only owner, who have the strongest incentives to reclassify wages and profits. The results indicate that these adjustment margins do not drive the results.[11]

In Appendix Figure 4 we report the profit-weighted share of entity-type switchers in each year of our sample both before and after TCJA. The combined switching rate of both C and S corps prior to TCJA was around 0.1%, and this share increased only trivially after TCJA to approximately 0.3%. Thus, although we document a clear increase in entity-type switching after TCJA, this form of tax shifting is negligible and does not bias our elasticities.

General Equilibrium Effects and SUTVA. A limitation of difference-in-difference designs is that they may mask market-level adjustments and general equilibrium effects absorbed by time fixed effects. For example, in our setting, if the tax cuts caused a broad-based increase in labor demand, inducing the wages of low-paid workers to rise for both C and S corp workers by an equal amount, then our research design would produce an elasticity estimate of zero even though the effect of the tax cuts on wages is positive. A related concern is that increases in profits or investment by C corps in the post-period could in principle be exactly offset by mirror-image losses or disinvestment by S corps — a possible form of SUTVA violation. In this case, our research design would produce positive elasticity estimates even though the true net effect is zero.

In Appendix 5, we evaluate these hypotheses using three forms of evidence: analyses of time trends, aggregated market-level event studies, an examination of worker flows across sectors. The evidence suggests that market-level adjustments were likely small over our sample period. With regard to worker flows, however, we do find evidence that increases in C corp employment after TCJA predominantly reflect a reallocation of workers from other sectors rather than a net surge in hiring. We directly account for this finding in the aggregate analysis in Section 5.

[11] Our results are consistent with Goodman et al. (2021), who find that the QBI deduction mostly did not increase wage-to-profit shifting among S corps. For multinationals, Garcia-Bernardo et al. (2022) find only small changes in the share of MNE profits booked abroad after TCJA.

4.9 Mechanisms and the Cost of Capital

In Section 4.7 we provided evidence that our empirical results are unlikely to be driven by liquidity effects. In this section we argue that our findings are consistent with theories in which firms are responsive to changes in the cost of capital. To illustrate these mechanisms, we use a stylized model of the corporate income tax. Suppose firms optimize after-tax profits π:

$$\pi = F(K, L)(1 - \tau) - wL(1 - \tau) - rK(1 - \theta\tau) \tag{5}$$

where τ is the corporate income tax rate, and $\theta \in [0, 1]$ is an expensing rate parameter capturing the share of production costs that are tax deductible. These costs may include fully deductible capital purchases (such as durable equipment eligible for bonus depreciation), partially deductible capital purchases (such as structures), and non-deductible costs (such as managerial effort, to the extent that it is not reflected in cost-deductible compensation). We assume that $F(K, L)$ varies across firms due to heterogeneous productivities, such that some firms are able to produce greater output than others with a fixed set of inputs. The first-order condition for profit maximization with respect to capital yields:

$$\underbrace{\frac{\partial F}{\partial K}}_{\text{MRPK}} = \underbrace{\frac{(1 - \theta\tau)}{1 - \tau} r}_{\text{cost of capital}} \equiv \phi \tag{6}$$

where the left side of the equation is the marginal revenue product of capital, and the right side is the user cost of capital, ϕ. The expression shows that, in general, either decreasing the tax rate τ or increasing the expensing parameter θ lowers the cost of capital ϕ. However, if all production costs are tax deductible (corresponding to the full expensing case where $\theta = 1$), then the tax rate does not affect the cost of capital, and thus does not affect capital demand.

In our setting, TCJA permanently cut the corporate tax rate and, due to the bonus incentives discussed in Section 4.8, also temporarily increased the expensing rate (for some assets, up to 100%). In response to the lower cost of capital, standard models predict that firms will demand more capital (that is, invest more), demand more labor (to the extent that capital and labor are complements), and increase their scale (in part because a higher capital stock may make the firm more productive). How should we make sense of the simultaneous changes in the tax rate and depreciation allowances in our setting? Although we cannot rule out that interactions of the changing tax rates and expensing rates played some role, several empirical and theoretical considerations suggest that the tax rate change is the dominant mechanism.

First, even if $\theta = 1$ by statute, evidence from Kitchen and Knittel (2016) and the Joint Committee on Taxation (2021) documents that a large fraction of firms do not claim bonus depreciation even when eligible to do so. Second, many costly investments are never fully tax deductible even by statute, such as investments in various forms of intangible capital.[12] Third, the change in expensing applied both to C and S corps, and we show in Appendix Table 3 that C and S corps faced nearly

[12] Cochrane (2017) argues: "Starting, organizing, and improving a business, figuring out the intangible organizational capital that makes it a successful competitor, creating a product and a brand name, are all crucial activities for which no investment tax credit will successfully offset a large profits tax."

identical exposure to expensing incentives, as measured by their pre-TCJA composition of eligible depreciable assets. Finally, expensing should have the largest effects on capital assets that would otherwise be deducted over long time horizons, for which the present value of the accelerated deduction is most valuable (House and Shapiro 2008, Zwick and Mahon 2017). By contrast, we document in Appendix Table 4 that our investment results are virtually entirely driven by investments in short-lived assets rather than long-lived ones. These considerations do not imply that TCJA's changes in expensing policy were economically inconsequential; rather, they imply that the effects of bonus depreciation are likely muted by our research design.

A complementary reconciliation of evidence and theory in our setting appeals to richer models that incorporate dynamics and adjustment costs, as in Auerbach and Hassett (1992). In these models, firms respond not only to current tax rates but also to the future path of policy. In the presence of high adjustment costs, firms will be highly sensitive to future policy, since investment will depend not only on the user cost of capital today but on the user cost of capital in the future. In Appendix C.5, we adopt the Auerbach and Hassett (1992) model and use cost-of-capital estimates from Foertsch (2018) to estimate elasticities with respect to (net of) effective marginal tax rates. The model flexibly incorporates salient features of firm behavior and of the U.S. business tax provisions before and after TCJA, including: forward-looking expectations; adjustment costs in investment; different tax rates on the income of shareholders of C versus S corps, including individual-level taxes on dividends, capital gains, interest income, and distributions of non-qualified annuities; the expansion and phase-out of bonus depreciation; incomplete take-up of bonus; and the sunsetting of the QBI deduction. Our net-of-tax elasticities using this method are very similar to our benchmark results reported in row 1 of Table 7.

5 Revenue Impacts, Excess Burden, and Incidence

In this section, we leverage the reduced form elasticities estimated in Section 4 to evaluate the short-run revenue impacts, excess burden, and incidence of TCJA's corporate tax cuts. We adopt a framework in the style of Feldstein (1999), such that elasticities of key outcomes with respect to the net-of-tax rate can be used to estimate the welfare consequences of tax changes. As in Saez et al. (2012), the validity of this approach rests on two assumptions: (a) negligible income shifting, and (b) negligible income effects. In Section 4.8 we presented several empirical tests suggesting that shifting behaviors are unlikely to drive our key elasticities. Moreover, the heterogeneity tests in Section 4.7 showed that liquidity effects are unlikely to drive the results, implying that income effects are not a concern.

When interpreting the results we focus only on the core provisions of TCJA relating to firms' marginal income tax rates, and abstract from issues relating to changes in personal income taxes, deficit financing, public goods provision, consumer prices, and dynamics. The main analysis incorporates tax changes for both C and S corps, although in Appendix Table D.1 we also show results that isolate effects on C corporations.

Revenue Impacts. Starting from the firm problem in equation 5, let the corporate tax base B

be defined as firm revenues less deductible costs: $B = F(K, L) - wL - \theta rK$. Total corporate tax revenues T are the product of the tax base B and the corporate tax rate τ: $T = \tau B$. In the absence of behavioral responses, mechanical changes in tax revenue from a change in the corporate net-of-tax rate $1 - \tau$ are given by holding the tax base constant:

$$dM = -Bd(1 - \tau) \tag{7}$$

The additional change in tax revenue generated by behavioral responses is given by:

$$dB = \frac{-\varepsilon^{\pi} B\tau}{1 - \tau} d\tau \tag{8}$$

where $\varepsilon^{\pi} = \frac{\partial B/B}{\partial(1-\tau)/(1-\tau)}$ is the elasticity of taxable income with respect to the net-of-tax rate. Intuitively, the extent to which revenue losses from tax cuts are offset by an expanding tax base is directly proportional to the taxable income elasticity ε^{π}. The total change in tax revenue accounting for behavioral responses is given by:

$$dT \equiv dM + dB = dM \left[1 - \frac{\tau \varepsilon^{\pi}}{1 - \tau} \right] \tag{9}$$

Welfare and Excess Burden. Define aggregate welfare W as the sum of after-tax private income Y and public tax revenues T: $W = Y + T$, where Y is the sum of private income received by firm owners (y^K) and different groups of workers (y^{L_j}), indexed by j: $Y = y^K + \sum_j y^{L_j}$. We use this definition of welfare, which corresponds approximately to GDP or total output, because it is transparent, can be objectively measured in the data, and can be easily compared with existing estimates in the literature. In general, changes in output and welfare will not be equivalent if, for example, there is curvature in individuals' utility functions. An alternate interpretation of W is that it quantifies the market value of the output distortion from the corporate tax.

Guided by our empirical results, we classify three groups of workers: low-paid workers, high-paid workers, and executives. Low-paid workers are defined as those in the bottom 90% of the within-firm wage distribution, and high-paid workers as those in top 10%. Workers and executives optimize consumption $C^L = w^j L^j$, where w^j is the wage for workers of type j and L^j is labor supply. The indirect utility function for workers is given by $U^j(w^j) = w^j L^j$, and the change in utility from a change in wages is given by:

$$dU^j(w^j) = L^j dw^j = w^j L^j \varepsilon^{L_j} d(1 - \tau) \tag{10}$$

where ε^{L_j} is the elasticity of earnings for workers of type j with respect to the net-of-tax rate.[13] Because firm owners optimize their demands for factor inputs, by the envelope theorem the change in firm owners' profits is given by $dy^K = -d\tau B + \tau dB$. The first term $-d\tau B$ implies that a reduction in the tax rate increases profits due to paying less tax. The second term captures the gains to firm owners due to an expanding tax base. These adjustments are embedded in the elasticity of after-tax profits to the net-of-tax rate, which we have estimated in the empirical analysis. We can thus compute the change in welfare for firm owners as:

[13] In principle, employment increases may also benefit workers. However, in Appendix Table 6 we find that TCJA primarily reallocated workers across sectors rather than increasing net hiring. We thus focus only on changes in wages.

$$dy^K = y^K \varepsilon^{\pi(1-\tau)} d(1-\tau) \tag{11}$$

where $\varepsilon^{\pi(1-\tau)}$ is the elasticity of after-tax profits with respect to the net-of-tax rate, and y represents after-tax profits in the baseline year. The total change in welfare is given by:

$$dW = dY + dT = dy^K + \sum_j dU^j + dT \tag{12}$$

We combine the elasticities estimated in Section 4 with moments from the tax data to compute the total change in welfare as expressed in equation 12. Finally, the marginal excess burden from the corporate tax cut is given by:

$$\frac{dW}{dT} = \frac{dT + dy^K + \sum_j dU^j}{dT} \tag{13}$$

which expresses the marginal welfare loss from raising an additional dollar of corporate tax revenue — or, equivalently, the marginal gain from an additional dollar of foregone tax revenue.

Incidence. To assess distributional impacts of TCJA's corporate tax changes, we adapt the framework developed in Suárez Serrato and Zidar (2016) and Fuest et al. (2018) to estimate the share of productive factors in the total corporate tax burden. Our analysis differs from these studies in two respects. First, the detailed microdata used in this study allow us to observe returns to firm owners, and thus allow us to empirically estimate how these returns are affected by changes in the corporate tax rate. Second, we estimate the effects of corporate tax changes on the full distribution of workers' earnings. Using these two sets of estimates, we evaluate the incidence of corporate taxes using weaker assumptions than are required when these outcomes are not empirically observable.

We extend our analysis to assess incidence not only on factors of production — that is, on firm owners and workers, as is standard in the literature — but also to approximate incidence over the income distribution, taking account of the empirical fact that many low-income workers own capital and most capital owners also work.[14] Doing so allows us to speak directly to research and policy debates about the progressivity of the corporate income tax. Because we observe workers' locations, we further evaluate the geographic incidence of corporate income tax cuts.

In evaluating incidence, we make the standard assumptions of a representative consumer and equal redistribution of tax revenues to all citizens. The former assumption rules out distributional impacts through changes in consumer prices, which are unobservable in our data. The latter assumption, while strong, allows us to avoid making even stronger alternative assumptions about the future path of fiscal policy. TCJA's tax cuts were deficit financed, and the future trajectory of

[14] In Fuest et al. (2018), the effects of corporate tax changes on returns to firm owners are unobservable, and changes in rental rates are assumed to be negligible. This assumption is appropriate in their analysis of tax changes in German municipalities, which they characterize as small open economies. In Suárez Serrato and Zidar (2016), returns to firm owners are unobserved but inferred via structural estimation. These studies evaluate impacts of corporate tax changes on median and mean wages, respectively, but do not assess impacts over the earnings distribution.

tax policy is always uncertain. We can thus compute firm owners' incidence share as:

$$I^F = \frac{dy^K}{dy^K + \sum_j dU^j} \tag{14}$$

Similarly, the share of workers in the total tax burden, I^{L_j}, is given by replacing the numerator in equation 14 with dU^j. We expand the traditional analysis of factor incidence along two dimensions. First, we evaluate incidence with respect to the population distribution of income. Doing so allows us to account for the fact that many workers are also firm owners (because they may hold equity portfolios, as discussed in Auerbach 2006) and that many firm owners also earn labor income (as documented in Smith et al. 2019). We assume that everyone works, and ascribe capital ownership to workers using data on the distribution of equity ownership from the Distributional Financial Accounts produced by the Federal Reserve Board (2018). We assume that executives are the top five paid workers, that high-paid workers are the remainder in the 90-99th percentiles, and that low-paid workers comprise the bottom 90%. Letting ω^j represent the capital share of workers of type j, we measure incidence across the income distribution for all workers, inclusive of both labor and capital income, as:

$$I^{L_j} = \frac{dU^j + \omega^j dy^K}{dy^K + \sum_j dU^j} \tag{15}$$

Second, we combine the distributional estimates from equation 15 with individuals' observed locations to estimate the geographic incidence of corporate income tax cuts across regions and commuting zones. Letting $\rho^{j(r)}$ represent the share of workers of type j living in region r, and N^r represent the region's population, we compute:

$$\frac{dY^r}{N^r} = \frac{\sum_j \rho^{j(r)}(dU^j + \omega^j dy^K)}{N^r} \tag{16}$$

which estimates the effect of the tax change on per capita income in region r. To the extent that firm ownership and employment are unequally spatially distributed across the country, the gains from corporate tax cuts are likely to be unequally geographically distributed as well.

5.1 Quantification Moments and Parameters

Table 9 summarizes the key inputs that we use to quantify the welfare and incidence implications of TCJA's corporate tax cuts. Panel A reports the empirically observed average tax rates and changes faced by C and S corps in the sample, and Panel B shows their aggregate 2016 tax liabilities, after-tax profits, and payrolls. Panel C reports the distribution of capital ownership as observed in the Federal Reserve Board's Distributional Financial Accounts data, and Panel D reviews the key net-of-tax elasticities estimated in the empirical analysis.

5.2 Revenue, Income, and Welfare Impacts

Panel A of Table 10 shows our estimates of the impacts of corporate income tax cuts on government tax revenues. To generate these estimates, we use the empirically estimated elasticities and key moments from our sample of tax returns. We show estimates of the mechanical effects on tax

revenue (that is, holding the tax base constant), as well as estimates of the total effects (taking account of behavioral responses). We present estimates both in dollars and as shares of 2016 GDP.

Panel A of Table 9 shows that, on average, TCJA reduced the marginal tax rate by 10 percentage points for C corps and by 4 percentage points for S corps. In the absence of behavioral responses, Panel A of Table 10 shows that this would lead to a $102 billion reduction in corporate tax revenues, corresponding to approximately 0.48% of 2016 GDP. However, because firms respond to the tax cut by expanding their operations and increasing pre-tax profits, the total reduction in tax revenue is modestly attenuated, instead $86 billion, or 0.40% of GDP. The results imply that a tax cut that would reduce revenues by $1 in the absence of behavioral responses results in an actual revenue loss of approximately $0.85.

Panel B of Table 10 shows our estimates of the change in private income from TCJA's corporate tax changes. We estimate that private income increases by $124 billion, or 0.58% of GDP. Approximately $63 billion of these gains accrue to firm owners and $61 billion accrue to workers.

Panel C shows our estimates of welfare and the marginal excess burden of the corporate tax. In the stylized model, welfare increases linearly in private income and public revenues. Private income gains of $124 billion combined with revenue losses of $86 billion imply a net increase in total welfare of $38 billion, or 0.18% of 2016 GDP. Even while the components of revenue and private income are generally precisely estimated, the confidence interval for welfare includes zero as well as gains of around 0.4% of GDP. This modest uncertainty is consistent with the variation in parameter estimates observed in Section 4.8. Our central point estimate of 0.18% is similar to Barro and Furman (2018), who simulate the effects of TCJA using a fully parameterized Ramsey model and estimate an increase in the annual GDP growth rate of around 0.13%.

Panel C also shows the marginal excess burden of the corporate income tax, $\frac{dW}{dT}$. We estimate that a marginal dollar of foregone revenue from corporate tax cuts generates an additional $0.44 in output. The results thus imply modest efficiency gains from corporate tax cuts. However, as we show below, these aggregate gains mask significant distributional effects.

5.3 Incidence

Panel A of Table 11 shows changes in private income for firm owners, executives, and high- and low-paid workers. Combining our reduced form elasticities from Section 4 with the moments from the tax data, we estimate that 51% of gains from the corporate tax cuts flow to firm owners; 10% flow to executives, 38% flow to high-paid workers, and 0% of the gains flow to low-paid workers.

Panel B reports our estimates of incidence over the income distribution. After allocating the gains of firm owners to workers using data from the Distributional Financial Accounts, approximately 24% of the gains from corporate tax cuts accrue to the top 1% of the earnings distribution, 56% accrue to the 90-99th percentiles, and 20% accrue to the bottom 90%. These results highlight the importance of considering the joint impacts of changes on both capital and labor income when assessing the distributional effects of corporate tax changes.

Panel C of Table 11 reports geographic incidence across Census regions, estimated from equation 16. Because firm owners and highly-paid workers are heavily concentrated in the

Northeastern and Western United States, gains from the tax cuts disproportionately benefit those regions. For example, the per capita income gain for residents of the Northeast ($481) is twice as large as for residents of the South ($244). The final row of this panel reflects that a significant share of corporate equity, approximately 38% in the 2016 baseline year, is held by foreigners. As a result, 17% of the overall gains from the tax cuts flow to foreigners.

Figure 10 maps variation in incidence across commuting zones (CZs). Beyond the regional patterns discussed in Table 11, the map highlights substantial within-region variation, with larger and higher-income CZs seeing larger gains. This pattern is underscored in Appendix Figure 10, which plots the change in income against the 2016 average earnings of corporate-sector employees. Relative to the median CZ gain of approximately $150 per capita, gains are approximately 3 times larger in New York City, and 5 times larger in the San Francisco Bay Area. The results imply that corporate income tax cuts not only increase income inequality across workers, but also contribute to widening inequality across urban and rural areas (Gaubert et al. 2021).

5.4 The Efficiency-Equity Tradeoff of the Corporate Income Tax

Given that the government must raise revenues to finance its operations, how should we interpret our results on the corporate income tax in the context of the broader national tax and transfer system? In Figure 11, we benchmark our findings against estimates from the literature on personal income and payroll taxes, which are the two other largest sources of federal tax revenues in the United States. The X-axis shows $-\varepsilon^B$, where ε^B is the elasticity of the tax base to an increase in the net-of-tax rate for each policy instrument. A larger magnitude of ε^B implies a larger distortion from the tax. The Y-axis shows the share of tax burden borne by the top 10% of the income distribution, where higher shares imply that the tax is more progressive.

The estimates of ε^B for the personal income tax (0.25) and payroll tax (0.21) are from Saez et al. (2012) and Saez et al. (2019), respectively. The former is based on a literature review of the empirical evidence on personal income taxes, while the latter is based on evidence of employment effects from a payroll tax reform in Sweden (to our knowledge, the best available estimate for payroll taxes in the literature). We compute estimates for the share of personal and payroll tax burdens borne by the top 10% of the income distribution using data from CBO (2021).

Viewed in the context of the literature, the results in Figure 11 suggest that the corporate income tax is approximately twice as inefficient as the personal income tax, but similarly progressive. Relative to the payroll tax, the corporate tax appears 3-4 times more progressive, although it is 2-3 times as inefficient. These results suggest that, on the margin, adjusting the composition of federal revenues toward a larger share of personal income taxes and a lower share of corporate income taxes may yield efficiency gains without sacrificing much in terms of progressivity.

6 Conclusion

We study the short-run impacts of the largest corporate income tax cut in history on U.S. firms and workers. We find that tax cuts cause firms to increase their sales, profits, labor demand, and investment. Labor earnings increase for workers in the top 10% of the within-firm earnings

distribution, and rise sharply for executives, but do not change for workers in the bottom 90%. We do not find that firms' responses are driven by liquidity effects, and interpret the results as consistent with a cost of capital channel.

We empirically estimate key elasticities of firm- and worker-level outcomes with respect to changes in corporate tax rates, and combine these elasticities with a stylized model to evaluate the revenue impacts, welfare gains, and incidence of TCJA's corporate tax cuts. In the model, reducing corporate tax revenues by \$1 generates an additional \$0.44 in output, indicating modest output gains. Distributionally, 80% of the gains flow to the top 10% of the earnings distribution, and 20% flow to the bottom 90%.

We conclude with important caveats. The very largest C corps have no clear analogues in the pass-through sector, and thus alternative research designs should be used to better understand their responses to the tax cuts. These results also do not capture a range of potential channels through which corporate tax cuts may affect welfare. For example, in the long run, higher investment may increase productivity, lower consumer prices, and broadly increase workers' real wages. While we estimate zero effects on low-income workers' earnings, it is possible that such gains may materialize over a longer time horizon. On the other hand, reductions in tax revenues may lead to a deterioration in the provision of public services, or reduce redistributive transfers, with potentially adverse implications for equity and efficiency. These are important topics for future research.

References

Acemoglu, D. and V. Guerrieri (2008). Capital Deepening and Nonbalanced Economic Growth. *Journal of Political Economy 116*(3), 467–498.

Akcigit, U., J. Grigsby, T. Nicholas, and S. Stantcheva (2022, 06). Taxation and Innovation in the Twentieth Century. *The Quarterly Journal of Economics 137*(1), 329–385.

Albertus, J. F., B. Glover, and O. Levine (2023). The Real and Financial Effects of Internal Liquidity: Evidence from the Tax Cuts and Jobs Act. *Available at SSRN 4471259*.

Alstadsæter, A., M. Jacob, and R. Michaely (2017). Do Dividend Taxes Affect Corporate Investment? *Journal of Public Economics 151*, 74–83.

Arulampalam, W., M. P. Devereux, and G. Maffini (2012). The Direct Incidence of Corporate Income Tax on Wages. *European Economic Review 56*(6), 1038–1054.

Auerbach, A. J. (2002). Taxation and Corporate Financial Policy. *Handbook of Public Economics 3*, 1251–1292.

Auerbach, A. J. (2006). Who Bears the Corporate Tax? A Review of What We Know. *Tax Policy and the Economy 20*, 1–40.

Auerbach, A. J. (2018). Measuring the Effects of Corporate Tax Cuts. *Journal of Economic Perspectives 32*(4), 97–120.

Auerbach, A. J. and Y. Gorodnichenko (2012). Measuring the Output Responses to Fiscal Policy. *American Economic Journal: Economic Policy 4*(2), 1–27.

Auerbach, A. J. and K. Hassett (1992). Tax Policy and Business Fixed Investment in the United States. *Journal of Public Economics 47*(2), 141–170.

Auerbach, A. J. and J. Slemrod (1997). The Economic Effects of the Tax Reform Act of 1986. *Journal of Economic Literature 35*(2), 589–632.

Bachas, P. and M. Soto (2021). Corporate Taxation Under Weak Enforcement. *American Economic Journal: Economic Policy 13*(4), 36–71.

Baker, S. R., S. T. Sun, and C. Yannelis (2020). Corporate Taxes and Retail Prices. Technical report, National Bureau of Economic Research.

Barro, R. J. and J. Furman (2018). Macroeconomic Effects of the 2017 Tax Reform. *Brookings Papers on Economic Activity 2018*(1), 257–345.

Bebchuk, L. A. and J. M. Fried (2003). Executive Compensation as an Agency Problem. *Journal of Economic Perspectives 17*(3), 71–92.

Becker, J., C. Fuest, and N. Riedel (2012). Corporate Tax Effects on the Quality and Quantity of FDI. *European Economic Review 56*(8), 1495–1511.

Bloom, N. and J. Van Reenen (2007). Measuring and Explaining Management Practices Across Firms and Countries. *The Quarterly Journal of Economics 122*(4), 1351–1408.

Carbonnier, C., C. Malgouyres, L. Py, and C. Urvoy (2022). Who Benefits from Tax Incentives? The Heterogeneous Wage Incidence of a Tax Credit. *Journal of Public Economics 206*, 104577.

Card, D., F. Devicienti, and A. Maida (2014). Rent-Sharing, Holdup, and Wages: Evidence from Matched Panel Data. *Review of Economic Studies 81*(1), 84–111.

Carrizosa, R., F. Gaertner, and D. P. Lynch (2023). Debt and Taxes? The Effect of TCJA Interest Limitations on Capital Structure. *Journal of the American Taxation Association 45*, 35–55.

CBO (2021). The Distribution of Household Income, Table 12. https://www.cbo.gov/publication/57061#data.

Census (2019). State Government Tax Collections Summary Report: 2019. Technical report.

Census Bureau (2019). 2019 SUSB Annual Data Tables by Establishment Industry. Technical report.

Chodorow-Reich, G., M. Smith, O. Zidar, and E. Zwick (2023). Tax Policy and Investment in a Global Economy. *Working Paper*.

Clausing, K. A. (2020). Profit Shifting Before and After the Tax Cuts and Jobs Act. *National Tax Journal 73*(4), 1233–1266.

Cloyne, J., J. Martinez, H. Mumtaz, and P. Surico (2022). Short-Term Tax Cuts, Long-Term Stimulus. Technical report, National Bureau of Economic Research.

Cochrane, J. (2017). Response to Williamson on Taxes. https://johnhcochrane.blogspot.com/2017/12/response-to-williamson-on-taxes.html.

Cohen, D. S., D.-P. Hansen, and K. A. Hassett (2002). The Effects of Temporary Partial Expensing on Investment Incentives in the United States. *National Tax Journal 55*(3), 457–466.

Conley, T. G., C. B. Hansen, and P. E. Rossi (2012). Plausibly Exogenous. *Review of Economics and Statistics 94*(1), 260–272.

Cummins, J. G., K. A. Hassett, and R. G. Hubbard (1994). A Reconsideration of Investment Behavior Using Tax Reforms as Natural Experiments. *Brookings Papers on Economic Activity 1994*(2), 1–74.

Cummins, J. G., K. A. Hassett, and R. G. Hubbard (1996). Tax Reforms and Investment: A Cross-Country Comparison. *Journal of Public Economics 62*(1-2), 237–273.

Curtis, E. M., D. G. Garrett, E. C. Ohrn, K. A. Roberts, and J. C. Suárez-Serrato (2021). Capital Investment and Labor Demand. Technical report, National Bureau of Economic Research.

De Simone, L., C. McClure, and B. Stomberg (2022). Examining the Effects of the Tax Cuts and Jobs Act on Executive Compensation. *Contemporary Accounting Research 39*, 2376–2408.

Desai, M. A. and D. Dharmapala (2009). Corporate Tax Avoidance and Firm Value. *The Review of Economics and Statistics 91*(3), 537–546.

Devereux, M. P., L. Liu, and S. Loretz (2014). The Elasticity of Corporate Taxable Income: New Evidence from UK Tax Records. *American Economic Journal: Economic Policy 6*(2), 19–53.

Devereux, M. P., B. Lockwood, and M. Redoano (2008). Do Countries Compete Over Corporate Tax Rates? *Journal of Public Economics 92*(5-6), 1210–1235.

Dobridge, C., P. Landefeld, and J. Mortenson (2021). Corporate Taxes and the Earnings Distribution: Effects of the Domestic Production Activities Deduction. *Working Paper*.

Dobridge, C. L., P. J. Kennedy, P. Landefeld, and J. Mortenson (2023). The TCJA and Domestic Corporate Tax Rates. *Working Paper*.

Dowd, T., C. Giosa, and T. Willingham (2020). Corporate Behavioral Responses to the TCJA for Tax Years 2017-2018. *National Tax Journal 73*(4), 1109–1134.

Duan, Y. and T. S. Moon (2022). Tax Cuts, Firm Growth, and Worker Earnings: Evidence from Small Businesses in Canada. *Working Paper*.

Fajgelbaum, P. D., P. K. Goldberg, P. J. Kennedy, and A. K. Khandelwal (2020). The Return to Protectionism. *The Quarterly Journal of Economics 135*(1), 1–55.

Feldstein, M. (1999). Tax Avoidance and the Deadweight Loss of the Income Tax. *Review of Economics and Statistics 81*(4), 674–680.

Foertsch, T. (2018). U.S. Effective Marginal Tax Rates on New Investment under Prior Law and the Tax Cuts and Jobs Act. *Working Paper*.

Fuest, C., A. Peichl, and S. Siegloch (2018). Do Higher Corporate Taxes Reduce Wages? Micro Evidence from Germany. *American Economic Review 108*(2), 393–418.

Gale, W. G., H. Gelfond, A. Krupkin, M. J. Mazur, and E. J. Toder (2019). Effects of the Tax Cuts and Jobs Act: A Preliminary Analysis. *National Tax Journal 71*(4), 589–612.

Gale, W. G. and C. Haldeman (2021). The Tax Cuts and Jobs Act: Searching for Supply-Side Effects. *National Tax Journal 74*(4), 895–914.

Garcia-Bernardo, J., P. Janskỳ, and G. Zucman (2022). Did the Tax Cuts and Jobs Act Reduce Profit Shifting by US Multinational Companies? Technical report, National Bureau of Economic Research.

Garrett, D. G., E. Ohrn, and J. C. Suárez Serrato (2020). Tax Policy and Local Labor Market Behavior. *American Economic Review: Insights 2*(1), 83–100.

Gaubert, C., P. Kline, D. Vergara, and D. Yagan (2021). Trends in US Spatial Inequality: Concentrating Affluence and a Democratization of Poverty. In *AEA Papers and Proceedings*, Volume 111, pp. 520–25.

Giroud, X. and J. Rauh (2019). State Taxation and the Reallocation of Business Activity: Evidence from Establishment-Level Data. *Journal of Political Economy 127*(3), 1262–1316.

Goodman, L., K. Lim, B. Sacerdote, and A. Whitten (2021). How Do Business Owners Respond to a Tax Cut? Examining the 199A Deduction for Pass-through Firms. Technical report, National Bureau of Economic Research.

Goolsbee, A. (1998). Investment Tax Incentives, Prices, and the Supply of Capital Goods. *The Quarterly Journal of Economics 113*(1), 121–148.

Gruber, J. and J. Rauh (2007). How Elastic is the Corporate Income Tax Base. *Taxing Corporate Income in the 21st Century*, 140–163.

Hall, R. E. and D. W. Jorgenson (1967). Tax Policy and Investment Behavior. *The American Economic Review 57*(3), 391–414.

Hanlon, M., J. L. Hoopes, and J. Slemrod (2019). Tax Reform Made Me Do It! *Tax Policy and the Economy 33*, 33–80.

Harberger, A. C. (1964). The Measurement of Waste. *The American Economic Review 54*(3), 58–76.

Hassett, K. A. and R. G. Hubbard (2002). Tax Policy and Business Investment. In *Handbook of Public Economics*, Volume 3, pp. 1293–1343. Elsevier.

Hendren, N. and B. Sprung-Keyser (2020). A Unified Welfare Analysis of Government Policies. *The Quarterly Journal of Economics 135*(3), 1209–1318.

Hines, J. R. and E. M. Rice (1994). Fiscal Paradise: Foreign Tax Havens and American Business. *The Quarterly Journal of Economics 109*(1), 149–182.

House, C. L. and M. D. Shapiro (2008). Temporary Investment Tax Incentives: Theory with Evidence from Bonus Depreciation. *American Economic Review 98*(3), 737–68.

Imbens, G. W. (2020). Potential Outcome and Directed Acyclic Graph Approaches to Causality: Relevance for Empirical Practice in Economics. *Journal of Economic Literature 58*(4), 1129–79.

Jensen, M. C. and K. J. Murphy (1990). Performance Pay and Top-Management Incentives. *Journal of Political Economy 98*(2), 225–264.

Joint Committee on Taxation (2017). Estimated Budget Effects of the Conference Agreement for H.R.1, the Tax Cuts and Jobs Act. *JCX-67-17*.

Joint Committee on Taxation (2018). General Explanation of Public Law 115-97. *JCS-1-18*.

Joint Committee on Taxation (2021). Tax Incentives for Domestic Manufacturing. *JCX-15-21*.

Joint Committee on Taxation (2022). Linking Entity Tax Returns and Wage Filings. *JCX-5-22*.

Juarez, L. (2022). Buyer Market Power and Exchange Rate Pass-Through. *Working Paper*.

Kennedy, P. and H. Wheeler (2022). Neighborhood-Level Investment from the U.S. Opportunity Zone Program: Early Evidence. *Working Paper*.

Kitchen, J. and M. Knittel (2016). Business Use of Section 179 Expensing and Bonus Depreciation, 2002–2014. *Office of Tax Analysis Working Paper 110*, 46.

Kline, P., N. Petkova, H. Williams, and O. Zidar (2019). Who Profits from Patents? Rent-Sharing at Innovative Firms. *The Quarterly Journal of Economics 134*(3), 1343–1404.

Kotlikoff, L. J. and L. H. Summers (1987). Tax Incidence. In *Handbook of Public Economics*, Volume 2, pp. 1043–1092. Elsevier.

Kumar, A. (2019). Did Tax Cuts and Jobs Act Create Jobs and Stimulate Growth? Early Evidence Using State-Level Variation in Tax Changes. *Early Evidence Using State-Level Variation in Tax Changes (November 15, 2019)*.

Link, S., M. Menkhoff, A. Peichl, and P. Schüle (2024). Downward Revision of Investment Decisions after Corporate Tax Hikes. *American Economic Review: Economic Policy*.

Mertens, K. (2018). The Near Term Growth Impact of the Tax Cuts and Jobs Act. *Working Paper*.

Moon, T. S. (2022). Capital Gains Taxes and Real Corporate Investment: Evidence from Korea. *American Economic Review 112*(8), 2669–2700.

Murphy, K. J. (1999). Executive Compensation. *Handbook of Labor Economics 3*, 2485–2563.

Nordhaus, W. D. (1975). The Political Business Cycle. *The Review of Economic Studies 42*(2), 169–190.

OECD/UCLG (2019). Report of the World Observatory on Subnational Government Finance and Investment: Country Profiles. Technical report.

Ohrn, E. (2018). The Effect of Corporate Taxation on Investment and Financial Policy: Evidence from the DPAD. *American Economic Journal: Economic Policy 10*(2), 272–301.

Ohrn, E. (2023). Corporate Tax Breaks and Executive Compensation. *American Economic Journal: Economic Policy 15*(3), 215–255.

OMB (2022). Historical Tables 2.1, 2.3. Technical report, White House: Office of Management and Budget.

Patel, E. S., N. Seegert, and M. G. Smith (2017). At a Loss: The Real and Reporting Elasticity of Corporate Taxable Income. *Comparative Political Economy: Fiscal Policy eJournal*.

Risch, M. (2024). Does Taxing Business Owners Affect Employees? Evidence from a Change in the Top Marginal Tax Rate. *Quarterly Journal of Economics, Forthcoming 139*, 637–692.

Romer, C. D. and D. H. Romer (2010, June). The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks. *American Economic Review 100*(3), 763–801.

Saez, E., B. Schoefer, and D. Seim (2019). Payroll Taxes, Firm Behavior, and Rent Sharing: Evidence from a Young Workers' Tax Cut in Sweden. *American Economic Review 109*(5), 1717–63.

Saez, E., J. Slemrod, and S. H. Giertz (2012). The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review. *Journal of Economic Literature 50*(1), 3–50.

Slemrod, J. (1995). Income Creation or Income Shifting? Behavioral Responses to the Tax Reform Act of 1986. *The American Economic Review 85*(2), 175–180.

Smith, M., D. Yagan, O. Zidar, and E. Zwick (2019). Capitalists in the Twenty-first Century. *The Quarterly Journal of Economics 134*(4), 1675–1745.

Suárez Serrato, J. C. and O. Zidar (2016). Who Benefits from State Corporate Tax Cuts? A Local Labor Markets Approach with Heterogeneous Firms. *American Economic Review 106*(9), 2582–2624.

Suárez Serrato, J. C. and O. Zidar (2023). Who Benefits from State Corporate Tax Cuts? A Local Labor Market Approach with Heterogeneous Firms: Further Results. *NBER Working Paper* (w31206).

The Board of Governors of the Federal Reserve System (2018). Distributional Financial Accounts. Technical report.

Yagan, D. (2015). Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut. *American Economic Review 105*(12), 3531–63.

Zidar, O. (2019). Tax Cuts for Whom? Heterogeneous Effects of Income Tax Changes on Growth and Employment. *Journal of Political Economy 127*(3), 1437–1472.

Zwick, E. and J. Mahon (2017). Tax Policy and Heterogeneous Investment Behavior. *American Economic Review 107*(1), 217–48.

Tables and Figures

Tables

TABLE 1: SUMMARY STATISTICS

	All Firms		C Corporations				S Corporations			
	(1) Mean	(2) SD	(3) Mean	(4) SD	(5) p50	(6) p90	(7) Mean	(8) SD	(9) p50	(10) p90
Taxes										
Marginal Tax Rate	0.251	0.159	0.214	0.168	0.340	0.350	0.311	0.121	0.378	0.396
Federal Tax (mil)	13.0	130.2	19.3	164.5	0.4	16.3	2.6	11.0	0.5	6.0
Federal Tax Per Worker	6,802	13,057	6,627	13,186	1,155	18,387	7,091	12,837	2,139	19,128
Sales and Profits										
Sales (mil)	686.5	3,782.7	981.1	4,751.1	101.6	1,466.9	201.1	563.3	86.1	402.5
Costs (mil)	414.2	2,481.1	578.1	3,113.3	43.3	777.1	144.1	460.4	52.0	299.1
Pre-Tax Profit (mil)	259.1	1,418.8	381.9	1,781.6	33.8	589.0	57.0	186.3	23.1	111.8
After-Tax Profit (mil)	246.1	1,336.4	362.5	1,677.5	32.0	565.8	54.4	181.7	21.5	106.5
Net Income (mil)	46.6	380.5	68.3	480.4	2.6	77.9	10.7	33.5	3.5	23.8
Shareholder Payouts										
Dividends (mil)	22.4	345.2	30.8	436.6	0.0	7.7	8.6	35.1	2.1	17.6
Share Buybacks (mil)	14.3	303.4	22.8	384.4	0.0	0.2	0.3	4.1	0.0	0.0
Total Payouts (mil)	36.7	591.2	53.6	748.4	0.0	13.3	8.8	35.3	2.2	18.1
Real Investment										
Net Investment (mil)	7.2	227.4	10.9	288.1	0.0	14.3	1.1	13.2	0.0	4.2
Net Investment / Lagged Capital	0.06	0.25	0.06	0.26	0.00	0.39	0.06	0.24	0.00	0.40
New Investment (mil)	31.6	364.4	47.6	460.5	1.9	46.4	5.2	30.9	0.8	10.1
Employment and Earnings										
Employment	2,309	19,906	3,274	24,997	321	4,196	720	3,957	243	1,214
Payroll (mil)	125	816	182	1,027	20	277	30	103	13	59
Mean Annual Earnings (thous)	64.7	52.5	68.9	49.6	57.5	114.6	57.7	56.1	50.8	87.2
Median Annual Earnings (thous)	47.7	28.0	51.3	31.0	44.2	88.0	41.8	20.9	39.4	64.6
Mean Top 5 Earnings (thous)	951	2,873	1,207	3,491	373	2,441	531	1,220	303	971
Firm Characteristics										
Firm Age	34	22	32	23	28	62	37	21	34	64
Multinational	0.16		0.22				0.06			
Private	0.88		0.81				1.00			
Capital Intensive	0.51		0.56				0.43			
N Firms	15,490		9,639				5,851			

Notes: Table shows summary statistics from 2016 for firms in the analysis sample. Medians and centile statistics are fuzzed to protect taxpayer privacy. For data sources and variable definitions see Section 3.

TABLE 2: MARGINAL TAX RATES AND TAXES PAID

	(1) τ_f^{MTR}	(2) $\ln(1-\tau_f^{MTR})$	(3) Tax/Sales$_{2016}$	(4) Tax Per Worker
C × Post	-0.050	0.066	-0.010	-2098
	(0.002)	(0.002)	(0.002)	(341)
2016 Outcome Mean	0.25	-0.31	0.06	6,802
Firm FE	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes
R2	0.73	0.73	0.80	0.60
N	108,430	108,430	108,430	108,430
N Firms	15,490	15,490	15,490	15,490

Notes: The unit of analysis is a firm-year. The table shows the $C \times Post$ coefficients from equation 2. These coefficients estimate average differential changes in outcomes between C and S corps before and after TCJA, controlling for firm and industry-size-year fixed effects. The outcome in column 1 is the firm's marginal tax rate, τ_f^{MTR}, and the outcome in column 2 is the log net-of-tax rate, $\ln(1-\tau_f^{MTR})$. The outcome in column 3 is tax scaled by the firms' baseline 2016 sales, and the outcome in column 4 is tax per worker, reported in nominal dollars. Marginal tax rates for S corps are defined as the weighted average of the shareholders' individual marginal tax rates, where the weights are given by the ownership shares. See Section 3 for details on the measurement of tax payments for S corps. Standard errors are clustered by firm.

TABLE 3: SALES, COSTS, AND PRE-TAX PROFITS

	(1) Sales	(2) Costs	(3) Pre-tax π	(4) Pre-tax π
C × Post	0.039	0.009	0.030	
	(0.012)	(0.007)	(0.007)	
$\Delta \ln(1-\tau_f)\times$ Post				0.455
				(0.110)
2016 Outcome Mean	1.00	0.53	0.47	0.47
Firm FE	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes
R2	0.39	0.65	0.61	n.a.
N	108,430	108,430	108,430	108,430
N Firms	15,490	15,490	15,490	15,490
First-Stage F				551.6

Notes: The unit of analysis is a firm-year. Columns 1-3 show the $C \times Post$ coefficients from equation 2. These coefficients estimate average differential changes in outcomes between C and S corps before and after TCJA, controlling for firm and industry-size-year fixed effects. Outcomes are scaled by 2016 baseline sales. Sales are gross receipts. Costs are equal to cost of goods sold, including both material and labor costs. Pre-tax profits are sales minus costs. Column 4 reports the elasticity corresponding to equation 4. Standard errors are clustered by firm. For additional information on data sources and variable definitions see Section 3 and Appendix B.

TABLE 4: AFTER-TAX PROFITS AND SHAREHOLDER PAYOUTS

	(1) After-Tax π	(2) Payouts	(3) Payouts (0/1)	(4) After-Tax π
C $\times$ Post	0.040	0.219	0.030	
	(0.007)	(0.029)	(0.005)	
$\Delta \ln(1-\tau_f)\times$ Post				0.612
				(0.112)
2016 Outcome Mean	0.41	1.10	0.54	0.41
Firm FE	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes
R2	0.63	0.85	0.76	n.a.
N	108,430	57,060	108,430	108,430
N Firms	15,490	9,820	15,490	15,490
First-Stage F				551.6

Notes: The unit of analysis is firm-year. Columns 1-3 show the $C \times Post$ coefficients from equation 2. These coefficients estimate average differential changes in outcomes between C and S corps before and after TCJA, controlling for firm and industry-size-year fixed effects. After-tax profits are defined as pre-tax profits minus tax, and are scaled by 2016 baseline sales. In column 2 the outcome is log shareholder payouts (i.e., the intensive margin). In column 3 the outcome is an indicator equal to 1 if shareholder payouts are positive (i.e., the extensive margin), where payouts are defined as the sum of cash and property distributions to shareholders. Column 4 reports the elasticity of after-tax profits with respect to the net-of-tax rate, estimated from equation 4. Standard errors are clustered by firm. For additional information on data sources and variable definitions see Section 3 and Appendix B.

TABLE 5: LABOR MARKET OUTCOMES

Panel A: Labor Market Outcomes

	(1) Emp	(2) Payroll	(3) w_{p50}	(4) w_{p95}	(5) w_{exec}
C × Post	0.023	0.034	-0.001	0.013	0.048
	(0.008)	(0.008)	(0.004)	(0.004)	(0.007)
2016 Outcome Mean	2,309	125	47,724	175,757	951,309
ε^{NTR}	0.35	0.51	-0.01	0.20	0.73
s.e.	0.12	0.12	0.06	0.06	0.11
Firm FE	Yes	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes	Yes
R2	0.96	0.97	0.94	0.93	0.92
N	108,430	108,430	108,430	108,430	108,430
N Firms	15,490	15,490	15,490	15,490	15,490

Panel B: Executive Compensation

	Outcome in all columns is log top 5 earnings			
	(1)	(2)	(3)	(4)
Controls:	Benchmark	Sales	Profit	Relative Sales
C × Post	0.048	0.045	0.045	0.046
	(0.007)	(0.007)	(0.007)	(0.007)
Firm FE	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes
R2	0.92	0.92	0.92	0.92
N	108,430	108,430	108,430	108,430
N Firms	15,490	15,490	15,490	15,490

Panel C: Incumbents and New Hires

	Outcome in all columns is log earnings		
	(1)	(2)	(3)
	All Workers	Incumbents	New Hires
C × Post	0.009	0.011	-0.000
	(0.003)	(0.003)	(0.005)
Firm FE	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes
R2	0.95	0.94	0.87
N	108,195	107,803	107,978
N Firms	15,490	15,490	15,490

Panel D: Worker Characteristics

	Bottom 90%	Top 10%	Executives
Mean Wage (2016)	37,831	170,377	951,309
Female (Share)	0.45	0.31	0.12
Age (Years)	39.3	46.6	53.7
N Workers	31,840,665	3,849,238	77,450

Notes: Unit of analysis in Panels A, B, and C is a firm-year. Panel A reports the $C \times Post$ coefficients obtained from estimating equation 2, where the outcomes are log employment, log payroll, log annual earnings of workers at the median and 95th percentile of the within-firm distribution, and log executive pay as proxied by the mean earnings of the top 5 highest paid workers at the firm. These coefficients estimate average differential changes in outcomes between C and S corps before and after TCJA, controlling for firm and industry-size-year fixed effects. The corresponding net-of-tax elasticities are shown as well, as estimated from equation 4. Panel B estimates variations of equation 2 where the outcome is log top 5 pay, and adds time-varying controls for several measures of firm performance. The outcome in Panel C is log earnings, and the table reports results from estimating equation 2 separately for all workers, incumbents, and new hires. Standard errors in Panels A, B, and C are clustered by firm. Panel D presents descriptive statistics from year 2016 for the individual characteristics of workers in the bottom 90% of the distribution, in the top 10%, and of the top five highest paid workers, where we use the latter as a proxy for executives.

TABLE 6: NET INVESTMENT

	(1) I_t/K_{t-1}	(2) I_t/Sales_{2016}	(3) I_t/K_{t-1}
C × Post	0.029	0.010	
	(0.004)	(0.003)	
$\Delta \ln(1-\tau_f)\times$ Post			0.445
			(0.070)
2016 Outcome Mean	0.06	0.01	0.06
Firm FE	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes
R2	0.21	0.23	n.a.
N	108,430	108,430	108,430
N Firms	15,490	15,490	15,490
First-Stage F			551.6

Notes: The unit of analysis is a firm-year. Columns 1-3 report the $C \times Post$ coefficients from equation 2. The coefficients estimate average differential changes in outcomes between C and S corps before and after TCJA, controlling for firm and industry-size-year fixed effects. Standard errors are clustered by firm. Net investment is the change in book value of depreciable capital assets minus accumulated book depreciation. The outcomes in columns 1 and 2 are net investment scaled by lagged capital and by baseline 2016 sales, respectively. Column 3 reports the elasticity of net investment with respect to the net-of-tax rate, computed from equation 4.

TABLE 7: ROBUSTNESS TO ALTERNATE SPECIFICATIONS

Specification	(1) $\ln(1-\tau)$	(2) ε^{π}	(3) $\varepsilon^{\pi(1-\tau)}$	(4) $\varepsilon^{w_{p50}}$	(5) $\varepsilon^{w_{p95}}$	(6) $\varepsilon^{w_{exec}}$	(7) ε^{I}
1. Benchmark	0.066	0.455	0.612	-0.008	0.200	0.730	0.445
s.e.	(0.002)	(0.110)	(0.112)	(0.056)	(0.064)	(0.107)	(0.070)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
2. Age Controls	0.069	0.352	0.510	-0.029	0.166	0.607	0.448
s.e.	(0.002)	(0.104)	(0.107)	(0.055)	(0.062)	(0.102)	(0.068)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
3. Location Controls	0.068	0.410	0.566	-0.013	0.203	0.728	0.447
s.e.	(0.002)	(0.109)	(0.112)	(0.056)	(0.064)	(0.107)	(0.070)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
4. Pre-Trend Controls	0.066	0.489	0.636	-0.020	0.198	0.713	0.446
s.e.	(0.002)	(0.101)	(0.106)	(0.055)	(0.062)	(0.105)	(0.070)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
5. Industry = NAICS6	0.066	0.453	0.611	-0.009	0.207	0.736	0.446
s.e.	(0.002)	(0.110)	(0.113)	(0.056)	(0.064)	(0.108)	(0.071)
N	108,423	108,423	108,423	108,423	108,423	108,423	108,423
6. Industry-Size Reweighting	0.065	0.566	0.749	0.007	0.201	0.778	0.462
s.e.	(0.002)	(0.118)	(0.127)	(0.064)	(0.069)	(0.118)	(0.073)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
7. IPW Weighting	0.065	0.432	0.606	0.073	0.275	0.688	0.454
s.e.	(0.002)	(0.114)	(0.121)	(0.076)	(0.079)	(0.124)	(0.077)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
8. Log Outcome	0.066	0.334	0.377	-0.008	0.200	0.730	0.755
s.e.	(0.002)	(0.126)	(0.125)	(0.056)	(0.064)	(0.107)	(0.399)
N	108,430	84,434	83,290	108,430	108,430	108,430	53,176
9. Winsorize 5-95	0.066	0.247	0.279	-0.003	0.185	0.651	0.254
s.e.	(0.002)	(0.046)	(0.046)	(0.033)	(0.044)	(0.089)	(0.059)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
10. 2016 Sales Weights	0.091	0.366	0.387	0.171	0.083	0.318	0.351
s.e.	(0.006)	(0.092)	(0.092)	(0.187)	(0.116)	(0.468)	(0.153)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430

Notes: The table shows variations on the first stage from equation 3 (column 1) and the net-of-tax elasticities from equation 4 (columns 2-7). The outcomes are: net-of-tax rate, pre-tax profits, after-tax profits, median worker earnings, 95th centile worker earnings, executive earnings, and net investment. All specifications include firm and industry-size-year fixed effects. The outcomes in columns 1 and 4-6 are logged, the outcomes in columns 2-3 are scaled by 2016 sales, and the outcome in column 7 is scaled by lagged capital. Row 1 shows the benchmark specification. Row 2 includes cohort-by-year effects, where cohorts are defined as the firms' year of incorporation. Row 3 controls for state-by-year fixed effects, using the firm's reported address on its tax return. Row 4 controls for pre-trends, interacting the firm-specific 2013-2016 change in the outcome with year indicators. Row 5 defines the industries as 6-digit (rather than 3-digit) NAICS codes. Row 6 reweights the sample so that the industry-size bin distribution of S corps exactly matches that of C corps. Row 7 applies inverse propensity score weights, where the propensity score is constructed from estimating a probit regression in the pre-period of C corp status on log sales, log employment, log payroll, the net investment rate, and indicators for multinationals and industries. Row 8 shows log transformations of the outcomes rather than scaling by baseline sales; for columns 1 and 4-6, these results are the same as in row 1. Row 9 winsorizes the outcomes at the 5th and 95th percentiles. Row 10 weights the outcomes by 2016 sales, except for labor market outcomes which are weighted by the 2016 total wage bill. Standard errors are clustered by firm.

TABLE 8: ROBUSTNESS TO ALTERNATE SAMPLES

Sample	(1) $\ln(1-\tau)$	(2) ε^{π}	(3) $\varepsilon^{\pi(1-\tau)}$	(4) $\varepsilon^{w_{p50}}$	(5) $\varepsilon^{w_{p95}}$	(6) $\varepsilon^{w_{exec}}$	(7) ε^{I}
1. All Firms	0.066	0.455	0.612	-0.008	0.200	0.730	0.445
s.e.	(0.002)	(0.110)	(0.112)	(0.056)	(0.064)	(0.107)	(0.070)
N	108,430	108,430	108,430	108,430	108,430	108,430	108,430
2. Exclude Large C-Corps	0.065	0.445	0.617	-0.003	0.243	0.780	0.446
s.e.	(0.002)	(0.117)	(0.120)	(0.059)	(0.068)	(0.110)	(0.074)
N	98,133	98,133	98,133	98,133	98,133	98,133	98,133
3. Exclude Mismatch Industries	0.068	0.370	0.533	-0.028	0.177	0.644	0.441
s.e.	(0.002)	(0.106)	(0.109)	(0.052)	(0.060)	(0.103)	(0.070)
N	100,893	100,893	100,893	100,893	100,893	100,893	100,893
4. Exclude Mfg Industries	0.065	0.537	0.751	0.046	0.253	0.846	0.534
s.e.	(0.002)	(0.142)	(0.147)	(0.073)	(0.083)	(0.136)	(0.090)
N	77,434	77,434	77,434	77,434	77,434	77,434	77,434
5. Unbalanced Panel	0.064	0.313	0.397	0.027	0.223	0.662	0.664
s.e.	(0.002)	(0.101)	(0.102)	(0.042)	(0.051)	(0.089)	(0.146)
N	189,930	179,574	177,561	181,064	181,064	181,064	179,516
6. Exclude Public Firms	0.068	0.252	0.412	-0.013	0.203	0.598	0.410
s.e.	(0.002)	(0.097)	(0.104)	(0.055)	(0.062)	(0.102)	(0.070)
N	94,808	94,808	94,808	94,808	94,808	94,808	94,808
7. Exclude DPAD Industries	0.070	0.474	0.727	0.014	0.222	0.620	0.496
s.e.	(0.003)	(0.159)	(0.166)	(0.082)	(0.090)	(0.139)	(0.095)
N	56,623	56,623	56,623	56,623	56,623	56,623	56,623
8. Exclude NOL Industries	0.082	0.240	0.443	-0.053	0.176	0.389	0.290
s.e.	(0.003)	(0.107)	(0.113)	(0.054)	(0.062)	(0.104)	(0.074)
N	54,306	54,306	54,306	54,306	54,306	54,306	54,306
9. Exclude 163(j) Industries	0.078	0.287	0.497	-0.075	0.169	0.541	0.330
s.e.	(0.003)	(0.110)	(0.117)	(0.054)	(0.064)	(0.109)	(0.079)
N	56,861	56,861	56,861	56,861	56,861	56,861	56,861
10. Exclude Bonus Industries	0.070	0.372	0.410	0.054	0.236	0.670	0.461
s.e.	(0.003)	(0.105)	(0.103)	(0.067)	(0.077)	(0.142)	(0.098)
N	56,938	56,938	56,938	56,938	56,938	56,938	56,938
11. Exclude Multinationals	0.068	0.343	0.525	-0.001	0.224	0.712	0.442
s.e.	(0.002)	(0.097)	(0.101)	(0.059)	(0.067)	(0.110)	(0.073)
N	90,909	90,909	90,909	90,909	90,909	90,909	90,909
12. Exclude 2017-2018	0.066	0.488	0.633	0.023	0.268	0.878	0.834
s.e.	(0.002)	(0.139)	(0.140)	(0.077)	(0.089)	(0.142)	(0.100)
N	77,450	77,450	77,450	77,450	77,450	77,450	77,450
13. Exclude Single-Owner S-Corps	0.073	0.447	0.573	-0.022	0.182	0.684	0.395
s.e.	(0.002)	(0.101)	(0.104)	(0.055)	(0.064)	(0.103)	(0.068)
N	97,556	97,556	97,556	97,556	97,556	97,556	97,556

Notes: The table shows first-stage estimates and net-of-tax elasticities for key outcomes estimated from equation 3 (column 1) and equation 4 (columns 2-7) using alternate samples. The outcomes are: net-of-tax rate, pre-tax profits, after-tax profits, median worker earnings, 95th centile worker earnings, executive earnings, and net investment. All specifications include firm and industry-size-year fixed effects. The outcomes in columns 1 and 4-6 are logged, columns 2-3 are scaled by 2016 sales, and column 6 is scaled by lagged capital. Row 1 shows the benchmark specification. Row 2 excludes firms with 2016 employment of greater than 10,000 or 2016 sales greater than $1 billion. Row 3 excludes industries where the firm share of C corps is less than 20% or greater than 80%. Row 4 excludes manufacturing industries. Row 5 uses the unbalanced panel of firms. Row 6 excludes public firms. Row 7 excludes industries where net operating losses are most common. Row 8 excludes industries most likely to claim the DPAD deduction. Row 9 excludes industries most likely to claim the interest deduction limitation. Row 10 excludes industries that benefit most from bonus depreciation. Row 11 excludes multinationals. Row 12 excludes years 2017 and 2018. Row 13 excludes S corps with only one owner.

TABLE 9: MOMENTS AND PARAMETERS

	All Corps	C Corps	S Corps
Panel A: MTRs (Sales-Weighted)			
Mean 2016 τ	0.25	0.24	0.31
Mean $\Delta\tau$	-0.09	-0.10	-0.04
Mean $\Delta\tau/\tau_{t-1}$	-0.36	-0.42	-0.13
Mean $\Delta \ln(1-\tau)$	0.13	0.14	0.06
Panel B: Firm Aggregates (bil)			
Tax	294	254	40
Taxable Income	1,162	913	249
After-Tax Profit	859	659	200
Executive Payroll	153	104	49
Top 10% Payroll	1,150	929	221
Bottom 90% Payroll	2,128	1,683	444
Panel C: Distribution of Capital			
Top 1%	0.27		
91-99%	0.34		
Bottom 90%	0.39		
Foreign Share		0.38	0.00
Panel D: Net-of-Tax Elasticities			
Pre-Tax Profit	0.46		
After-Tax Profit	0.61		
Executive Pay	0.73		
Top 10 Earnings	0.33		
Bottom 90 Earnings	0.00		

Notes: Table shows the moments and parameters that we use to quantify the revenue, income, and welfare impacts of TCJA's corporate tax cuts. Data in Panels A and B are directly observed in our sample of tax records, and data in Panel C are from the 2018 Federal Reserve Board Distributional Financial Accounts. The parameters in Panel D are estimated in the empirical analysis. The pre-tax profit elasticity is estimated as in Table 3, and the after-tax profit elasticity is estimated as in Table 4. The executive earnings elasticity is estimated as in Table 5, Panel A. We set the top 10% earnings elasticity as the average of the 90th, 95th, and 99th centile elasticities from Table 5, Panel A, and set the bottom 90% earnings elasticity to zero.

TABLE 10: REVENUE AND WELFARE ESTIMATES

	2016 USD		GDP Share	
	bil $	(se)	%	(se)
Panel A: Tax Revenues				
Mechanical, dM	-102		-0.48	
Total, dT	-86	4	-0.40	0.02
Panel B: After-Tax Private Income				
Total Income, dY	124	26	0.58	0.12
Capital Income, dy^K	63	12	0.30	0.06
Labor Income, dy^L	61	22	0.28	0.10
Panel C: Welfare and Excess Burden				
Welfare, dW	38	28	0.18	0.13
Marginal Excess Burden, dW/dT	.44	.33		

Notes: The table shows estimated revenue, income, and welfare impacts from TCJA's changes in marginal income tax rates on C and S corps. Outcomes in columns 1 and 2 are scaled in billions of dollars. Outcomes in columns 3 and 4 are scaled as a percentage of GDP. Standard errors constructed from 1,000 bootstrap simulations of the jointly estimated parameters. The change in mechanical revenue is computed from equation 7, and the total change in revenue is computed from equation 9. The change in capital income is computed from equation 11, and the change in labor income is computed from equation 10. The change in welfare dW is defined as the sum of the changes in private income dY and tax revenue dT. The marginal excess burden is defined as the ratio of the change in welfare to the change in tax revenues. See Section 5 for details.

TABLE 11: INCIDENCE ESTIMATES

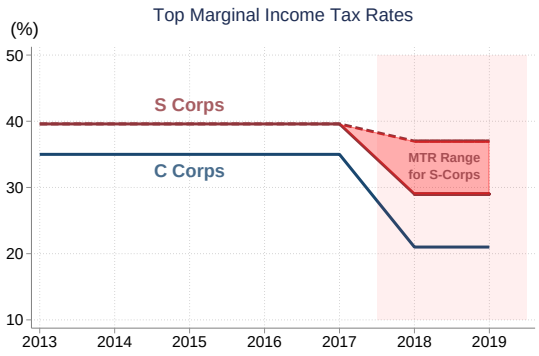
	2016 USD		Share	
	$	(se)	%	(se)
Panel A: Factors ($ bil)				
Firm Owners	63	12	51	11
Executives	13	2	10	2
High-Paid Workers	48	9	38	6
Low-Paid Workers	0	14	0	14
Panel B: Distributional ($ bil)				
Top 1%	30	4	24	4
91-99%	69	11	56	7
Bottom 90%	25	15	20	10
Panel C: Geographic ($ per capita)				
Northeast	481	100	29	1
Midwest	291	74	18	1
South	244	62	15	1
West	342	74	21	1
Foreign	—		17	4

Notes: Panel A reports the incidence of the corporate tax cuts on firm owners, executives, and high- and low-paid workers, based on equations 11, 10, and 14. Panel B reports distributional incidence, based on equation 15. Columns 1 and 2 report dollar estimates, and columns 3 and 4 show the share of total incidence borne by each subgroup. Standard errors constructed from 1,000 bootstrap simulations of the jointly estimated parameters are shown in columns 2 and 4. We allocate gains of firm owners to workers using data on the distribution of capital ownership, including ownership by foreigners, from the Federal Reserve Distributional Financial Accounts. Panel C reports geographic incidence, based on equation 16, and leveraging the observed residential locations of individuals in the tax data. We classify states into regions using the definitions from the U.S. Census, provided here, with the minor modification of classifying Delaware, DC, and Maryland as belonging to the Northeast rather than to the South.

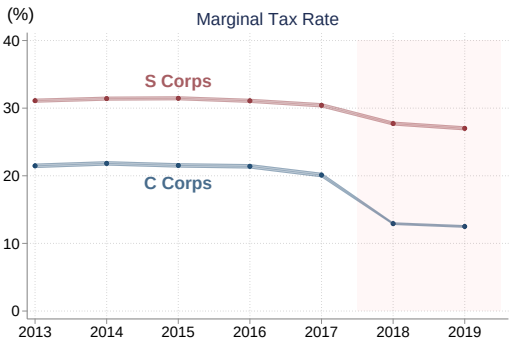
Figures

FIGURE 1: MARGINAL INCOME TAX RATES AND TAXES PER WORKER

(A) TOP MTR (STATUTORY)



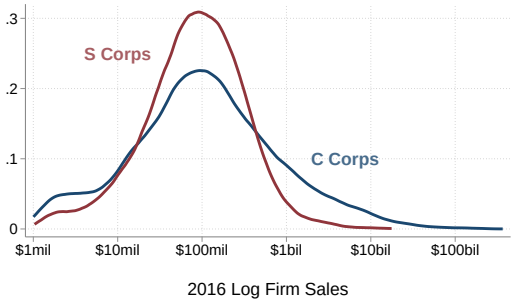
(B) AVERAGE MTR (OBSERVED)



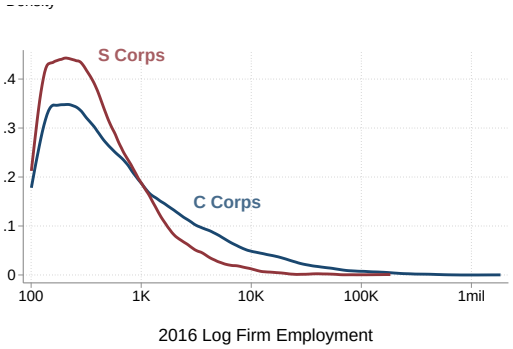
Notes: Panel A shows top statutory marginal tax rates for C and S corps before and after TCJA. Panel B shows the average MTRs observed in the sample. See Section 3 and Appendix B for additional data details.

FIGURE 2: FIRM SIZE DISTRIBUTIONS AND INDUSTRY COMPOSITION

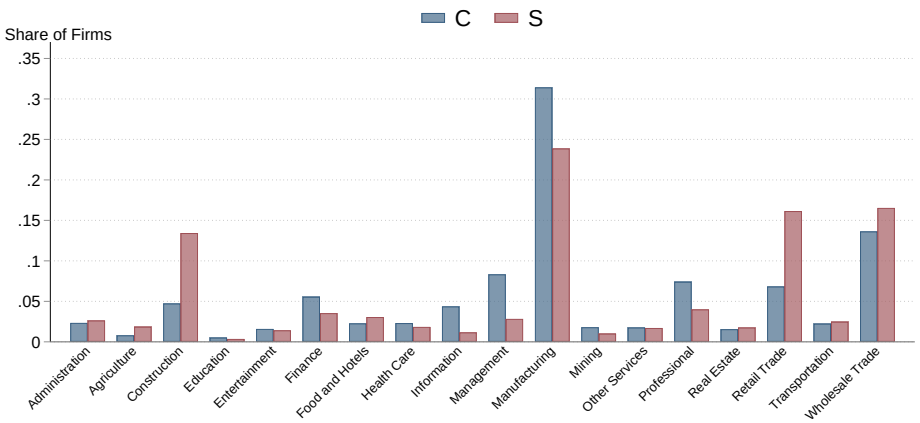
(A) 2016 SALES



(B) 2016 EMPLOYMENT



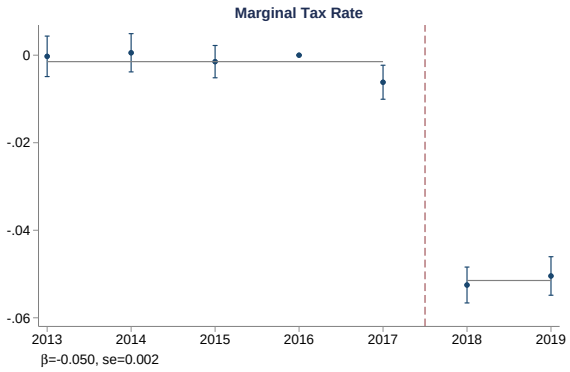
(C) INDUSTRY COMPOSITION



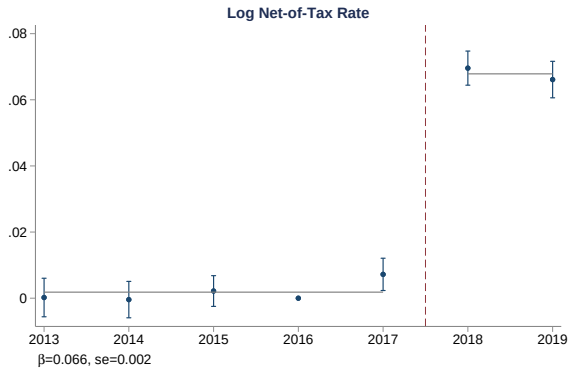
Notes: Panels A and B show the distribution of 2016 log firm sales and employment, respectively, for C and S corps in the analysis sample. Panel C shows the NAICS-2 industry composition of firms in the sample.

FIGURE 3: EVENT STUDIES: MARGINAL TAX RATES AND TAXES PAID

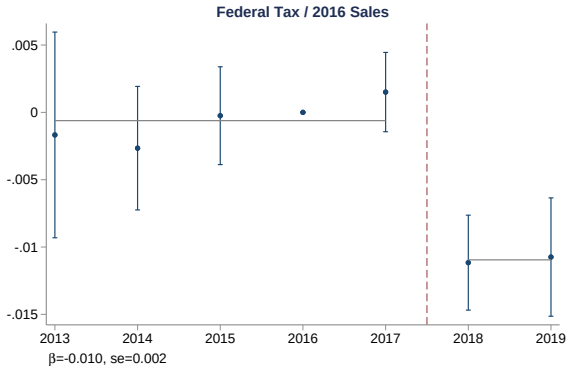
(A) MARGINAL TAX RATE



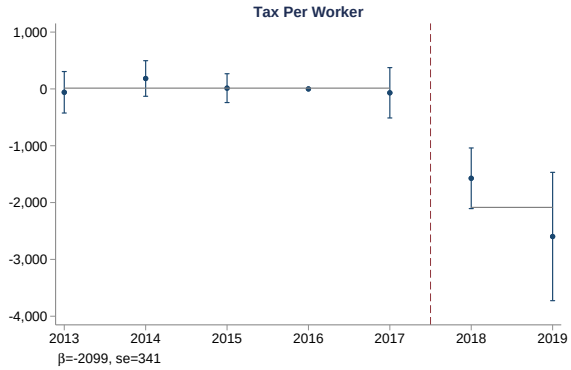
(B) LOG NET-OF-TAX RATE



(C) TAX / 2016 SALES



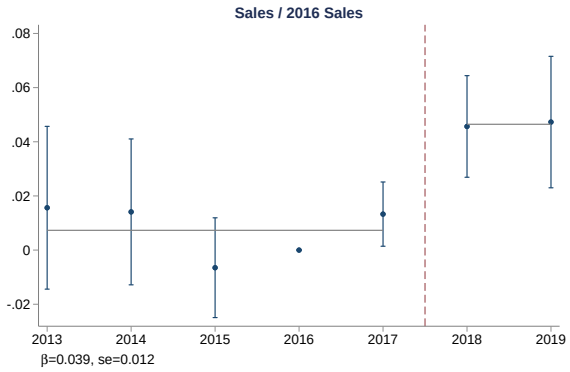
(D) TAX PER WORKER



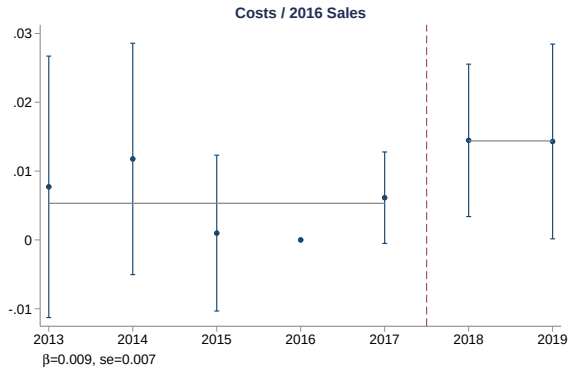
Notes: The unit of analysis is a firm-year. The panels plot the β_t coefficients estimated from equation 1. These coefficients capture average differences in outcomes between C and S corps over time after controlling for firm and industry-size-year fixed effects. Standard errors are clustered by firm and error bands show 95% confidence intervals. The grey lines show the average of the coefficients in the pre- and post- periods, and the corresponding DiD coefficient and standard error are shown in the bottom left of each panel. The outcome in Panel A is the firm's marginal tax rate, τ_f^{MTR}, and the outcome in Panel B is the log net-of-tax rate, $\ln(1-\tau_f^{MTR})$. The outcome in Panel C is tax scaled by the firms' baseline 2016 sales, and the outcome in Panel D is tax per worker, reported in dollars. Marginal tax rates for S corps are defined as the weighted average of the shareholders' individual marginal tax rates, where the weights are given by the ownership shares. See Section 3 for details on the measurement of tax payments for S corps. For data sources and variable definitions see Section 3.

FIGURE 4: EVENT STUDIES: FIRM SALES, COSTS, AND PRE-TAX PROFITS

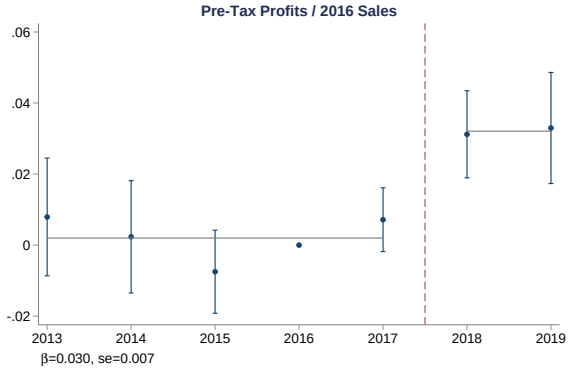
(A) SALES



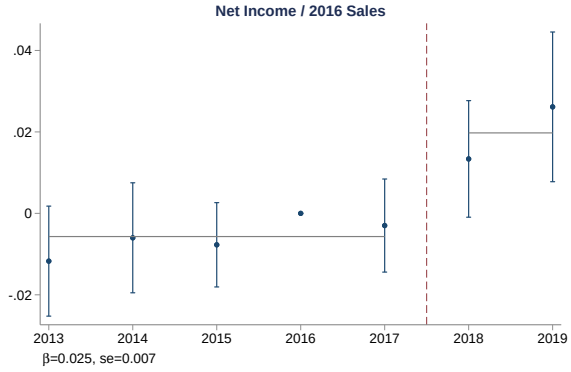
(B) COSTS



(C) PRE-TAX PROFIT



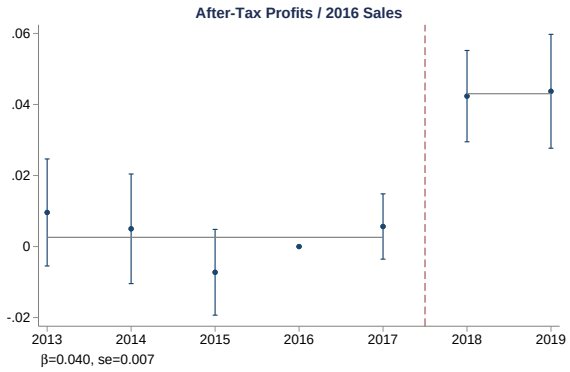
(D) NET INCOME



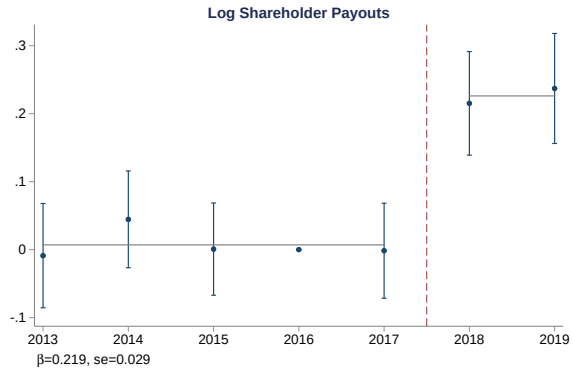
Notes: Unit of analysis is firm-year. The panels plot the β_t coefficients estimated from equation 1. These coefficients capture average differences in outcomes between C and S corps over time after controlling for firm and industry-size-year fixed effects. Standard errors are clustered by firm, and error bands show 95% confidence intervals. The grey lines show the average of the coefficients in the pre- and post- periods, and the corresponding DiD coefficient and standard error are shown in the bottom left of each panel. Sales are gross receipts. Costs are equal to cost of goods sold, including both material and labor costs. Pre-tax profits are sales minus costs. Net income is an alternate harmonized measure of pre-tax profit; see Section 3 and Appendix B for details.

FIGURE 5: EVENT STUDIES: AFTER-TAX PROFITS AND SHAREHOLDER PAYOUTS

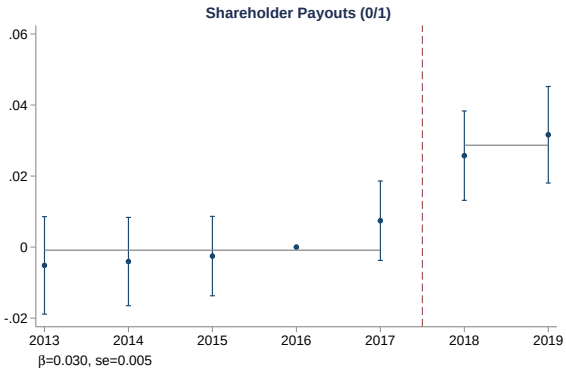
(A) AFTER-TAX PROFITS



(B) PAYOUTS (INTENSIVE MARGIN)



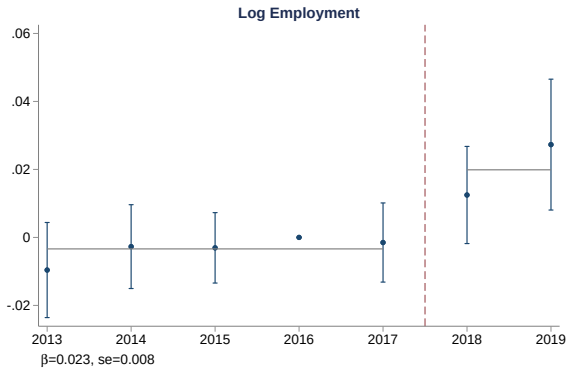
(C) PAYOUTS (EXTENSIVE MARGIN)



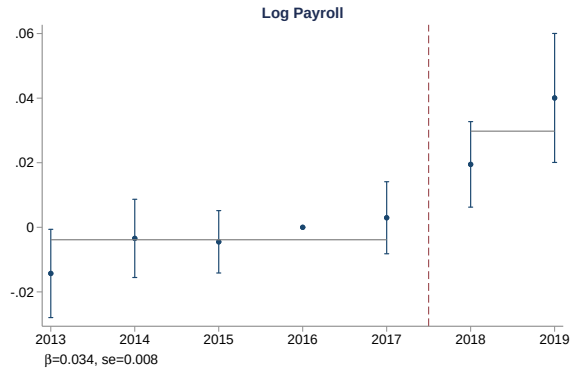
Notes: The unit of analysis is a firm-year. The panels plot the β_t coefficients estimated from equation 1. These coefficients capture average differences in outcomes between C and S corps over time after controlling for firm and industry-size-year fixed effects. Standard errors are clustered by firm and error bands show 95% confidence intervals. The grey lines show the average of the coefficients in the pre- and post- periods, and the corresponding DiD coefficient and standard error are shown in the bottom left of each panel. In Panel A, after-tax profits are defined as pre-tax profits minus tax, and are scaled by 2016 baseline sales. In Panel B, the outcome is log shareholder payouts (the intensive margin). In Panel C, the outcome is an indicator equal to 1 if shareholder payouts are positive (the extensive margin), where payouts are defined as the sum of cash and property distributions to shareholders. For additional information on data sources and variable definitions see Section 3 and Appendix B.

FIGURE 6: EVENT STUDIES: LABOR MARKET OUTCOMES

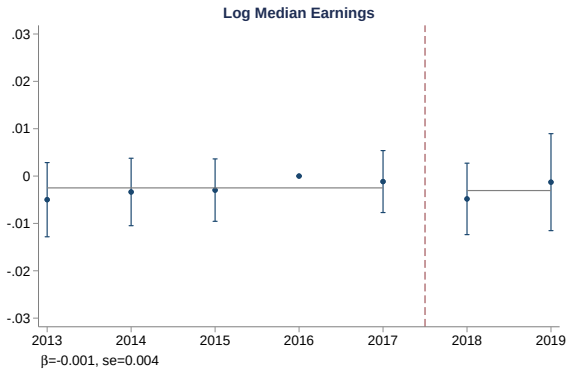
(A) LOG EMPLOYMENT



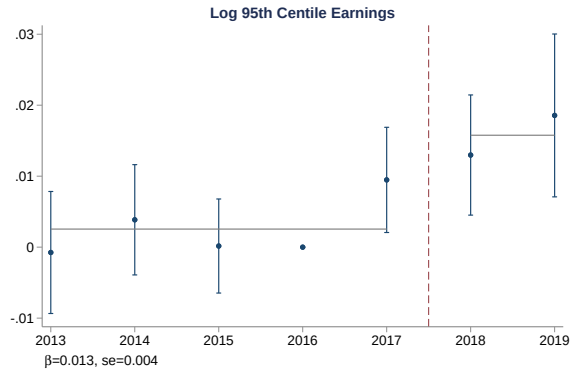
(B) LOG PAYROLL



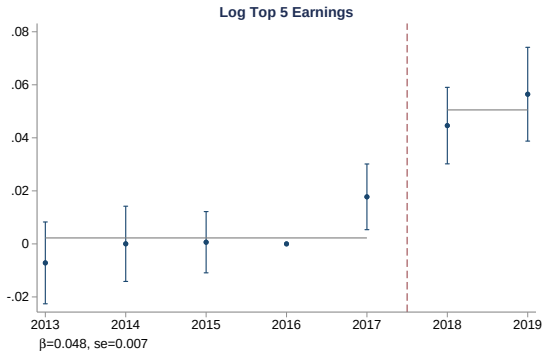
(C) LOG MEDIAN EARNINGS



(D) LOG 95TH CENTILE EARNINGS

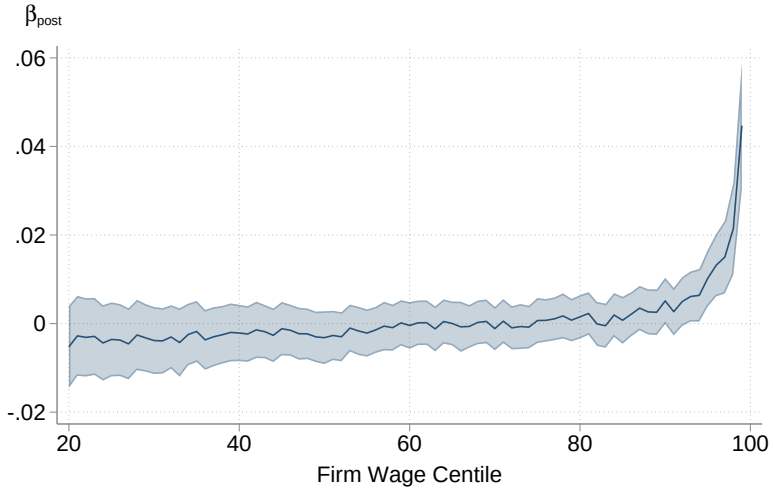


(E) LOG TOP 5 EARNINGS



Notes: Unit of analysis is firm-year. The panels plot the β_t coefficients obtained estimated from estimating equation 1. These coefficients capture average differences in outcomes between C and S corps over time after controlling for firm and industry-size-year fixed effects. Standard errors are clustered by firm and error bands show 95% confidence intervals. The grey lines show the average of the coefficients in the pre- and post- periods, and the corresponding DiD coefficient and standard error are shown in the bottom left of each panel. Employment, payrolls, and annual earnings are computed by matching worker-level W-2's with firm-level tax returns. For additional details on data sources and variable definitions see Section 3.

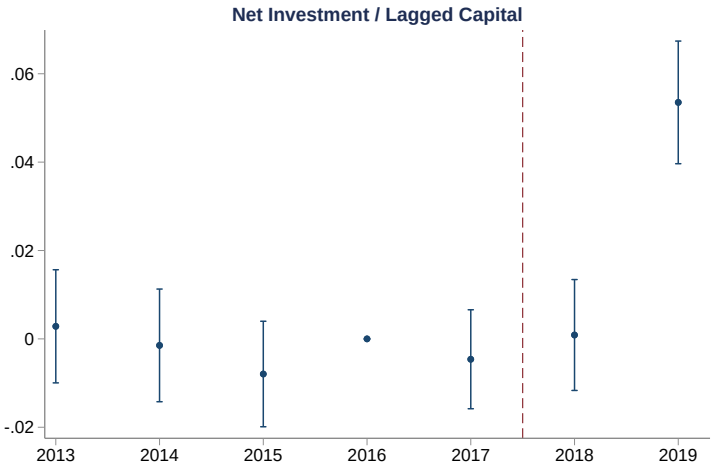
FIGURE 7: DISTRIBUTION OF EARNINGS RESPONSES



Notes: Unit of analysis is firm-year. Figure plots the β coefficients obtained from estimating equation 2, where the outcomes are centiles of the distribution of workers' wages within the firm. For example, centile 50 measures the annual earnings of the median worker within the firm, and centile 90 captures the annual earnings of the worker at the 90th percentile of the within-firm earnings distribution. We exclude the bottom 20% of the distribution, which is imprecisely estimated due to the presence of part-time workers. For additional details on data sources and variable definitions, see Section 3. Standard errors are clustered by firm and error bands show 95% confidence intervals.

FIGURE 8: EVENT STUDIES: INVESTMENT

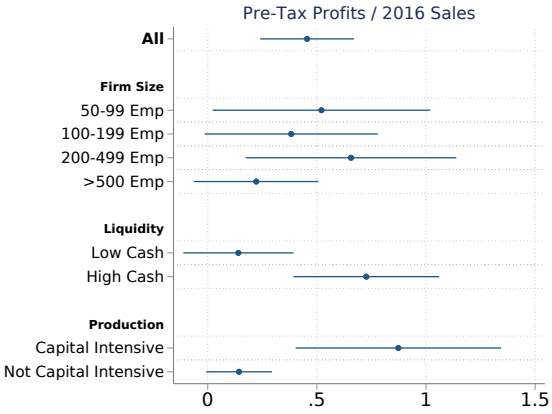
(A) NET INVESTMENT RATE



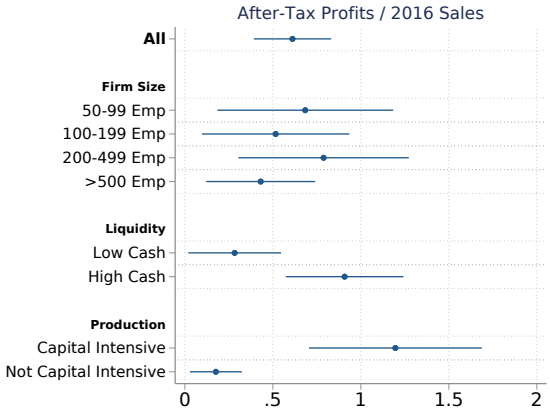
Notes: Unit of analysis is firm-year. The figure plots the β_t coefficients estimated from equation 1. The outcome is net investment scaled by lagged capital. These coefficients capture average differences in outcomes between C and S corps over time after controlling for firm and industry-size-year fixed effects. Standard errors are clustered by firm and error bands show 95% confidence intervals. Net investment is defined as the change in book value of depreciable capital assets minus accumulated book depreciation. See Section 3 for data sources and variable definitions.

FIGURE 9: FIRM HETEROGENEITY

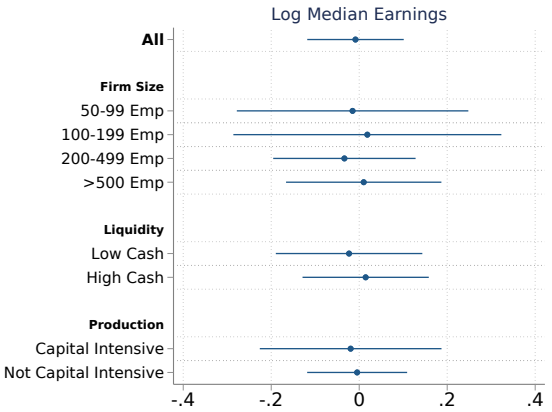
(A) PRE-TAX PROFIT



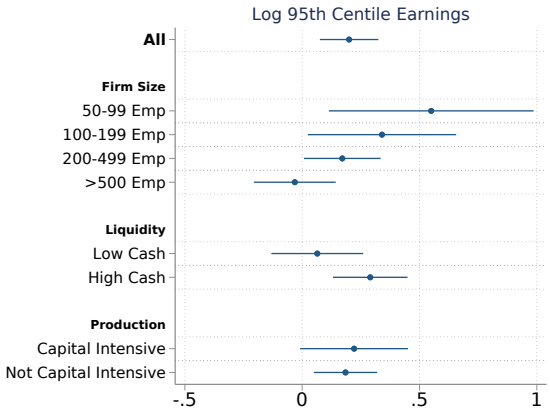
(B) AFTER-TAX PROFIT



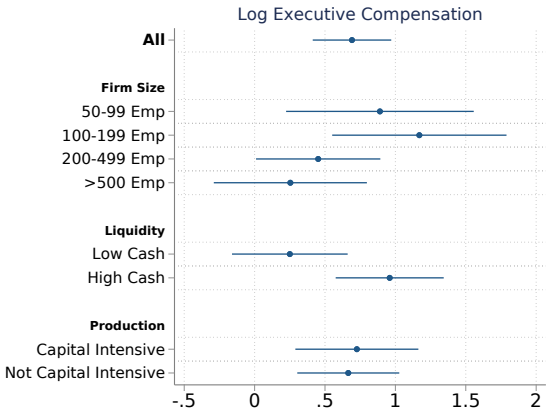
(C) MEDIAN EARNINGS



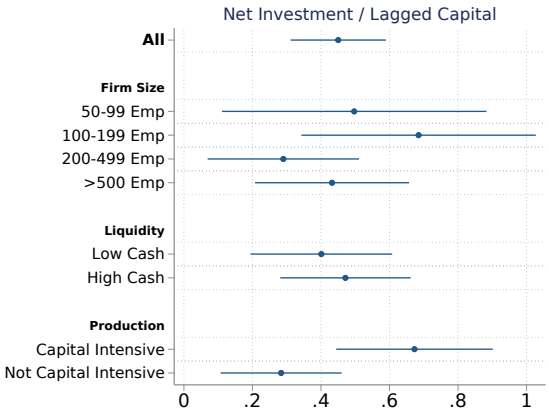
(D) 95TH CENTILE EARNINGS



(E) EXECUTIVE EARNINGS



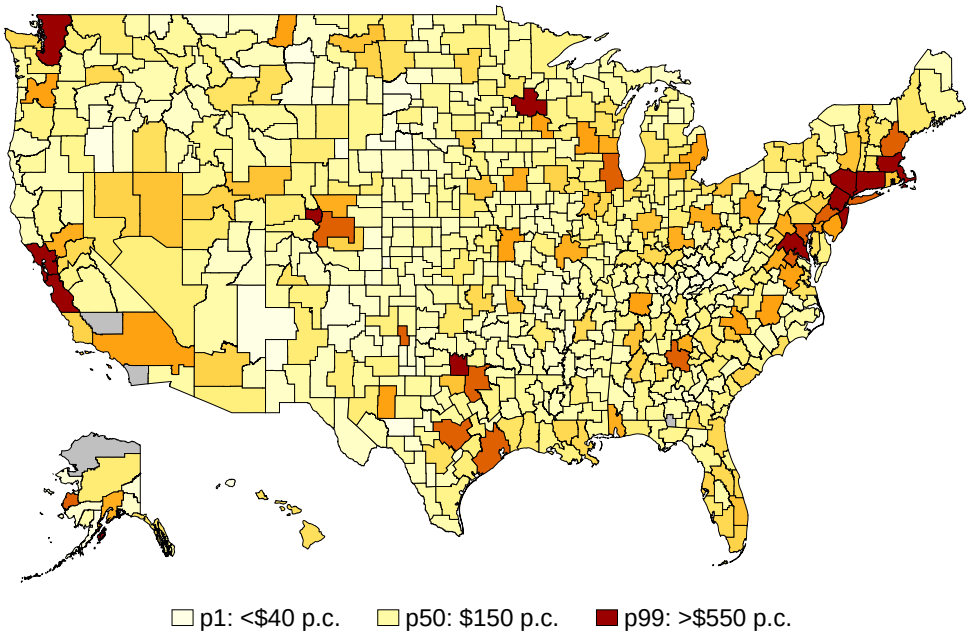
(F) NET INVESTMENT



Notes: The unit of analysis is a firm-year. The table reports heterogeneity in the net-of-tax elasticities from equation 4 using different samples of firms. The specifications split by firm size include firm and industry-year fixed effects. All others include firm and industry-size-year fixed effects. Error bars show 95% confidence intervals.

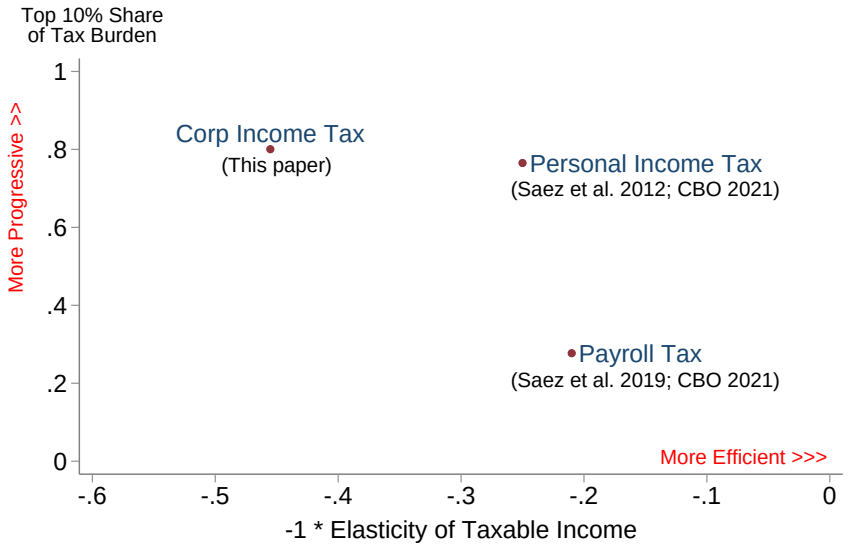
FIGURE 10: GEOGRAPHIC INCIDENCE

FIGURE 11: CHANGE IN PER CAPITA INCOME ACROSS COMMUTING ZONES



Notes: The unit of analysis is a commuting zone. The map illustrates geographic variation in changes in per capita income due to the corporate tax cuts, estimated from equation 16. Income gains are proportional to color intensity in the map, with darker colors representing larger gains.

FIGURE 11: THE EFFICIENCY-EQUITY TRADEOFF IN CONTEXT



Notes: The figure contextualizes our results on the corporate income tax, compared with the personal income and payroll taxes, the two other largest sources of US federal tax revenue. The tax base elasticity, shown on the X-axis, is a measure of the market value of tax distortions. The share of the tax burden borne by the top 10% of the income distribution, shown on the Y-axis, is a measure of progressivity. The estimates for the corporate income tax are from this paper. The ETI estimates for the personal income and payroll tax are from Saez et al. (2012) and Saez et al. (2019), respectively, and the progressivity estimates are from CBO (2021).

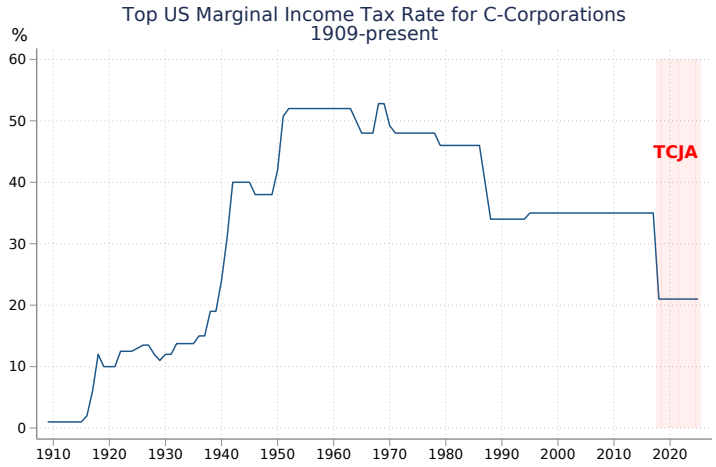
Appendices for Online Publication

A Appendix to Section 2: Setting and Institutional Details

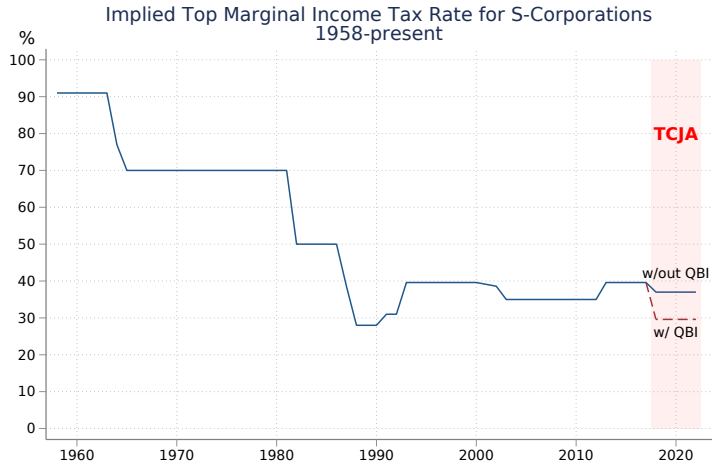
A.1 Historical Statutory Federal Top Marginal Income Tax Rates

Appendix Figure 1: Top Marginal Income Tax Rates in Historical Context

Panel A: Top Marginal Tax Rate for C corporations



Panel B: Implied Top Marginal Tax Rate for S corporations



Notes: Data from the Tax Foundation. Panel A shows the evolution of the top statutory marginal corporate income tax rate facing C corporations throughout U.S. history. Panel B shows the implied top statutory marginal income tax rate facing S corporations, which is equal to the top rate facing individuals.

A.2 Marginal Income Tax Rates and Brackets Before and After TCJA

Appendix Table 1: Marginal Income Tax Brackets Before and After TCJA

Panel A: Tax Brackets for C Corporations

Income Bracket	Upper Income Threshold	Pre-TCJA MTR	Post-TCJA MTR	Firm Share	Emp Share	Sales Share
0	0	0	0	0.446	0.219	0.225
1	50,000	0.15	0.21	0.090	0.008	0.002
2	75,000	0.25	0.21	0.034	0.003	0.001
3	100,000	0.34	0.21	0.023	0.002	0.001
4	335,000	0.39	0.21	0.087	0.011	0.005
5	10,000,000	0.34	0.21	0.227	0.059	0.048
6	15,000,000	0.35	0.21	0.016	0.012	0.011
7	18,000,000	0.38	0.21	0.007	0.006	0.007
8	>18,000,000	0.35	0.21	0.070	0.680	0.699

Panel B: Implied Tax Brackets for S Corporations (Married Joint Filers)

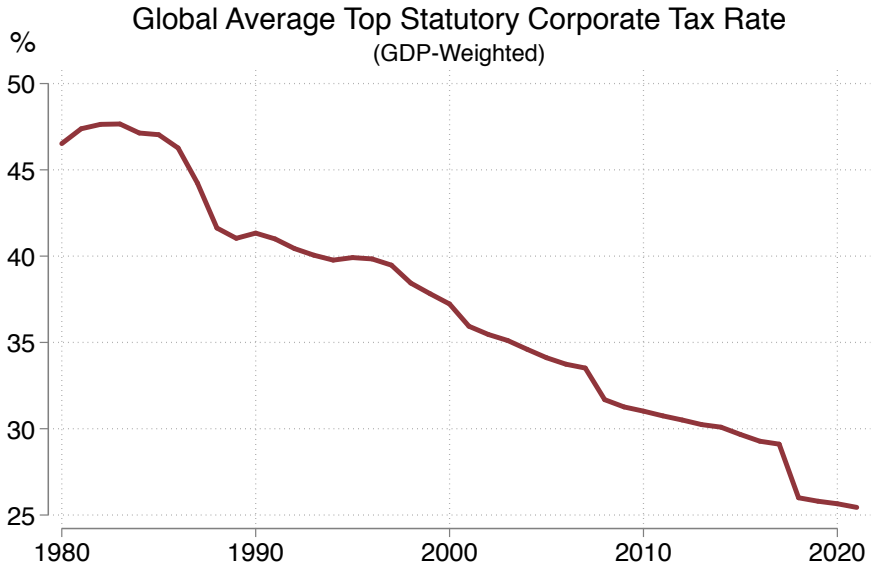
Income Bracket	Upper Income Threshold 2017 ($)	2017 MTR	Upper Income Threshold 2019 ($)	2019 MTR
1	18,650	.1	19,400	.1
2	75,900	.15	78,950	.12
3	153,100	.25	168,400	.22
4	233,350	.28	321,450	.24
5	416,700	.33	408,200	.32
6	470,700	.35	612,350	.35
7	>470,700	.396	>612,350	.37

Notes: Panel A reports the statutory marginal income tax brackets facing C corps before and after TCJA. The firm, employment, and sales shares are calculated in tax year 2016 using SOI data. Panel B illustrates an example of the implied statutory marginal income tax brackets facing S corp owners. This schedule varies depending on the taxpayer's filing status. For illustrative purposes, the schedule shown here is for married joint filers, although in practice we use the corresponding tax schedules for different filer types.

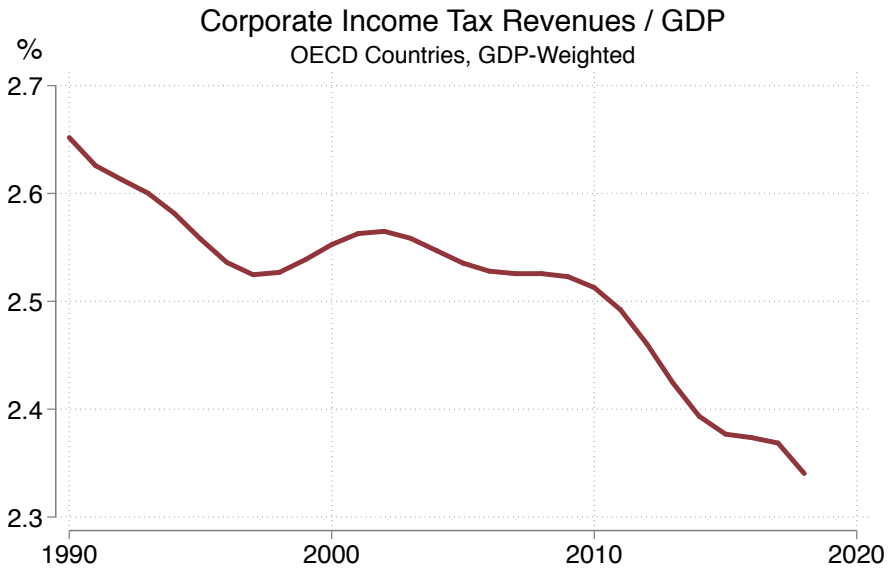
A.3 A Global Perspective on Corporate Income Taxes

Appendix Figure 2: Corporate Taxes in Global Perspective

Panel A: Average Global Corporate Tax Rates



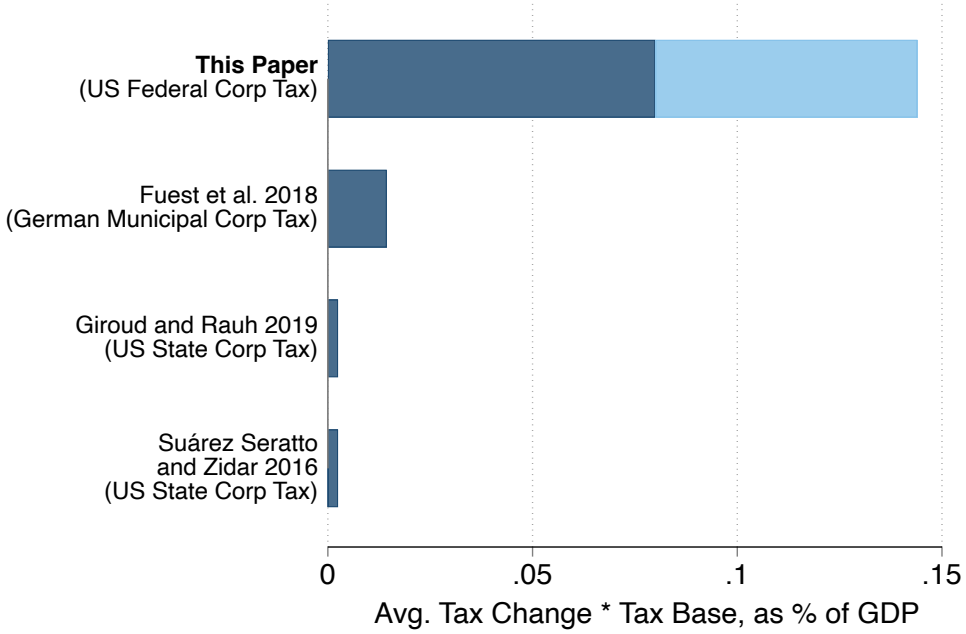
Panel B: Average Corporate Income Taxes in OECD Countries as a Share of GDP



Notes: Panel A shows the GDP-weighted global average top statutory corporate income tax rate since 1980, using data from the Tax Foundation. Panel B shows the lowess-smoothed GDP-weighted ratio of corporate income tax revenues to GDP since 1990 for OECD countries, using data from the OECD tax database (data are not available for this series before 1990).

A.4 TCJA Tax Cut in the Context of Recent Literature

APPENDIX FIGURE 3: TCJA TAX CHANGE VS. OTHER RECENT STUDIES



Notes: The figure shows the average tax change studied in several recent papers, multiplied by the tax base and scaled by GDP. The average tax change in Fuest et al. (2018) is 0.9 percentage points, and the LBT tax base is approximately 1.6% of GDP (see OECD/UCLG 2019). The average tax change in Suárez Serrato and Zidar (2016) and Giroud and Rauh (2019) is 1.0 percentage point, and the state corporate tax base is approximately 0.25% of GDP (Census 2019). In this study, the 2016 federal corporate tax base is approximately 1.6% of GDP (OMB 2022), the average differential tax change between C and S corps is 5.0 percentage points (indicated by the dark blue bar), and the unconditional average tax change is 9.0 percentage points (indicated by the sum of the dark and light blue bars).

A.5 The QBI Deduction

Here we broadly summarize the Qualified Business Income (QBI) deduction enacted in TCJA. For comprehensive details, see documentation from the IRS here.
Commonly referred to as "Section 199A" after the corresponding section of the tax code, the QBI deduction is potentially available to S corporations, as well as other pass-through businesses not included in our analysis sample, and is not relevant for C corporations. The deduction amount is equal to the minimum of:

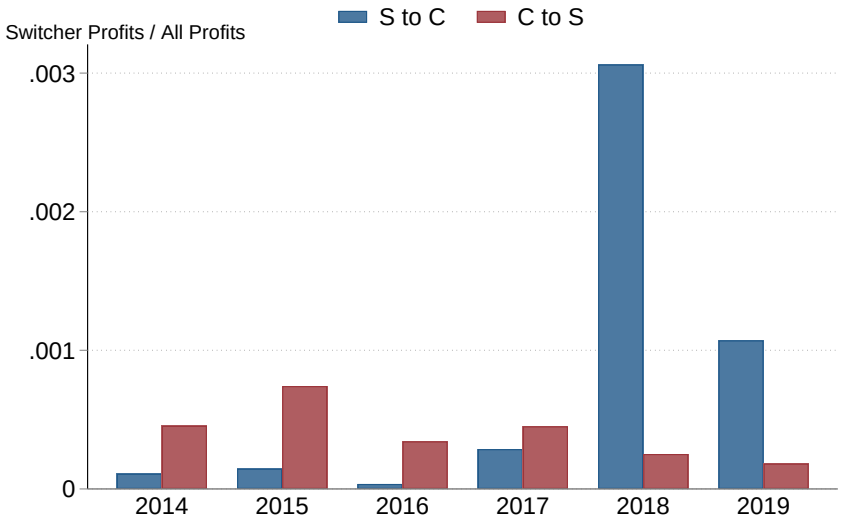
1. 20% of taxable income, where taxable income is calculated prior to assessing the QBI deduction, minus net capital gains; or,
2. The sum of both:
   (a) 20% of the aggregate qualified real estate and investment trust (REIT) dividends and publicly traded partnership (PTP) income; and
   (b) Deductible amounts from qualified trades or businesses.

Moreover, the deduction amount is subject to an adjusted gross income limitation after which the deduction amount phases out. The limitation amounts for tax year 2019 where $321,000 for married taxpayers, and $161,000 for single taxpayers. If a taxpayer exceeds these limitations, then two additional tests apply:

- Qualified business income must not be from a service specialized trade or business, otherwise the deduction amount is phased out; and
- The deduction amount is limited to 50% of the firm's allocated W-2 wages.

A.6 Entity-Type Switching

APPENDIX FIGURE 4: CORPORATE ENTITY-TYPE SWITCHING, 2013-2019



Notes: Figure shows the profit-weighted share of firms that switch their legal entity type from C-to-S or from S-to-C over the sample period.

A.7 Other Policy Changes Enacted in TCJA

Below we briefly summarize other major provisions of TCJA affecting corporations. For more details on these reforms, see Auerbach (2018) and Joint Committee on Taxation (2018).

- **Net Operating Loss (NOL) Deductions:** TCJA limited NOL deductions to 80% of a corporation's taxable income, eliminated NOL carrybacks, and allowed indefinite NOL carryforwards.
- **Domestic Production Activities Deduction (DPAD):** TCJA repealed DPAD, which provided a tax deduction to corporations that produce manufactured goods within the United States.
- **Alternative Minimum Tax (AMT):** TCJA repealed the corporate AMT, which imposed a minimum tax of 20% on corporations' relevant taxable income in excess of a $40,000 exemption threshold, excluding the firm's AMT foreign tax credit.
- **Interest Deductions**: TCJA limited the net interest payment deductions to 30% of adjusted taxable income.
- **Bonus Depreciation:** TCJA temporarily allowed corporations to immediately deduct 100% of the cost of newly purchased eligible capital investments (known as "full expensing"), an increase from 50% prior to TCJA, but scheduled to phase out beginning in 2023.
- **Taxation of Foreign Income**: TCJA introduced several changes to taxation of corporations' income earned abroad. The most significant changes include: (a) a one-time tax on previously accumulated foreign income and an elimination of tax on repatriated income; (b) a minimum tax on foreign income above a threshold return on tangible assets (known as Global Intangible Low-Taxed Income, or GILTI); (c) a minimum tax on deductible related-party transactions to U.S. subsidiaries, known as the Base Erosion and Anti-Abuse Tax, or BEAT; and (d) a lower tax rate on income earned from foreign sales, known as Foreign Derived Intangible Income, or FDII.

B Appendix to Section 3: Data Sources, Variable Definitions, and Measurement

B.1 Variable Definitions

Below we describe how we measure key outcomes in the study. For additional details on construction of the SOI samples, see documentation provided by the IRS here.

Taxes Paid

Taxes paid are defined for C corporations as Form 1120: Schedule L, line 31. For S corps, taxes paid are measured using the following methodology:

1. Match S corp owners to their 1040s
2. Use 1040s to compute each owner's average tax rate (ATR) and total taxes paid on pass-through income
   (a) Calculate ATR for a tax unit: ATR = Taxes Paid / Taxable Income
   (b) Record net ordinary business income: NET_OBI = Line 32 from 1040 (from schedule E)
   (c) Compute taxes paid on business income: BIZ_TAX_PAID = min(max{ATR*(NET_OBI),0},total tax paid on 1040)
   (d) Save table unique by TIN-year
3. Compute total non-negative pass-through income from 1120s and 1065s by owner
   (a) Append all K1s from 1120s and 1065s with positive OBI (drop K1s with OBI<$0)
   (b) Sum up OBI by TIN-year; call the sum OBI_SUM
   (c) Save table unique by TIN-year
4. Merge table 2 and 3 by TIN-year
5. Compute the OBI share of each pass-through business in the owner's portfolio
   (a) Append all K1s from 1120s with positive OBI
   (b) Match m:1 by TIN with table 4; new table is unique by TIN-K1-year
   (c) Compute share of each K1 in total OBI, call it W = OBI / OBI_SUM
   (d) Allocate tax_paid in proportion to the shares: S_TAX = W*BIZ_TAX_PAID
   (e) Sum up S_TAX by firm-year, final table is unique by EIN-year

Sales, Costs, and Profits

Sales are defined for C and S corporations as Form 1120: line 1c and Form 1120-S: line 1c, respectively. Costs of goods sold are defined for C and S corporations as Form 1120: line 2 and Form 1120-S: line 2, respectively. Pre-tax gross profits are defined as sales minus costs of goods sold. After-tax gross profits are defined as gross profits minus taxes paid. Harmonized Net Income is defined for C corporations as Form 1120: line 28 minus Form 1120: line 29b plus Form 1120: line 25, and is defined for S corporations as Form 1120-S Schedule K: line 18.

Shareholder Payouts

Dividends are defined for C corporations as Form 1120: Schedule M-2, line 5a plus line 5c. For S corporations, dividends are defined as Form 1120-S: Schedule K, line 17c. Share buybacks are defined as the non-negative annual dollar change in the treasury stock; treasury stock is defined for C corporations as Form 1120: Schedule L, line 27(d) and for S corporations as Form 1120-S: Schedule L, line 26(d). Total payouts are defined as dividends plus share buybacks.

Investment

Capital assets is defined for C and S corporations as buildings and other depreciable assets less accumulated depreciation, as measured on Form 1120: Schedule L, line 10b(d) and Form 1120-S: Schedule L, line 10b(d), respectively. Net investment is defined as the annual dollar change in capital assets. Short-life new investment is defined for C and S corporations as the sum of Form 4562: lines 19a(c) to 19c(c). Long-life new investment is defined for C and S corporations as the sum of Form 4562 lines 19d(c) to 19i(c) plus the sum of lines 20a(c) to 20c(c) plus the sum of line 14, line 15, and line 16. Total new investment is defined as short-life new investment plus long-life new investment. Following Yagan (2015), we winsorize the top and bottom 5% of investment outcomes within entity-type-year bins.

Employment and Earnings

Employment for C and S corporations is the total number of unique individuals with a W-2 issued by the firm. Worker earnings are measured for C and S corporation employees from Form W-2, box 5 (Medicare Wages). Payroll is the sum of workers' annual earnings. Top-5 compensation is defined for C and S corporations as the combined annual W-2 earnings of the top

five highest paid workers at the firm. Reported compensation captures several but not all components of pay, including: wage, salary, and bonus income; stock options and grants, when exercised; and non-qualified deferred compensation. However, this measure is a lower bound on executive compensation, as it does not capture stock options or grants before they are exercised, and does not include incentive stock option plans.

Other Firm Characteristics

Age is defined as tax year minus year of incorporation, where year of incorporation for C corporations and S corporations is defined as Form 1120: box C and Form 1120-S: box E, respectively. Multinational firms are defined as those whose foreign sales share in the pre-period is greater than 1%, where foreign sales are defined as the sum of gross receipts from all Controlled Foreign Corporations (that is, foreign subsidiaries) reported for each foreign subsidiary on Form 5471 Schedule C: line 1c. Capital intensity is defined at the industry level as total capital assets divided by total sales. C and S corporations are classified as capital intensive if the mean of this ratio in the pre-period (2013 to 2016) is greater than the sample median. Industry is defined for C corporations as the first three digits of Form 1120: Schedule K, line 2a and for S corporations as the first three digits of Form 1120-S: Schedule B, line 2a.

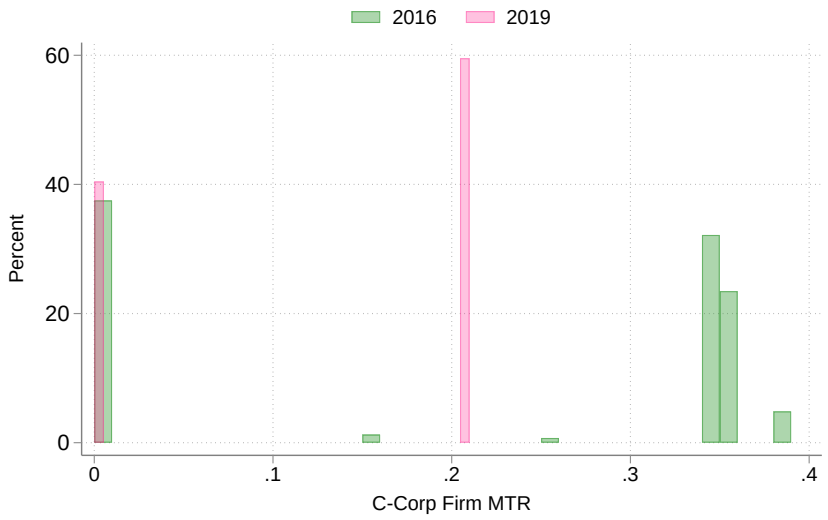
Fuzzed Centile Statistics

When reporting centile statistics, we compute averages of all observations within a quantile range rather than report the singular centile observation in the data. For example, rather than report the true median, we report the average of all observations in the 50th quantile of the distribution. We take these measures to ensure and protect taxpayers' privacy in compliance with IRS policy.

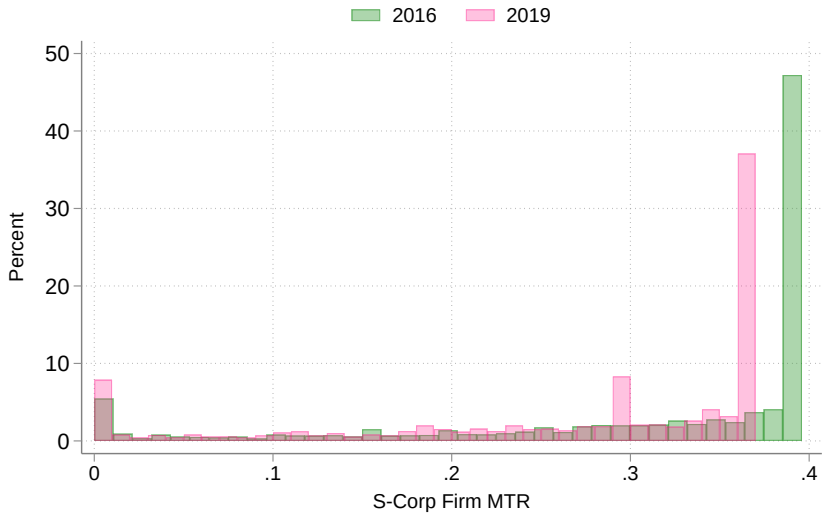
B.2 Sample Distribution of Firms' Statutory Marginal Income Tax Rates Before and After TCJA

Appendix Figure 5: Sample Distribution of C corp Statutory MTR's

Panel A: Marginal Income Tax Rates for C corporations



Panel B: Implied Marginal Income Tax Rates for S corporations

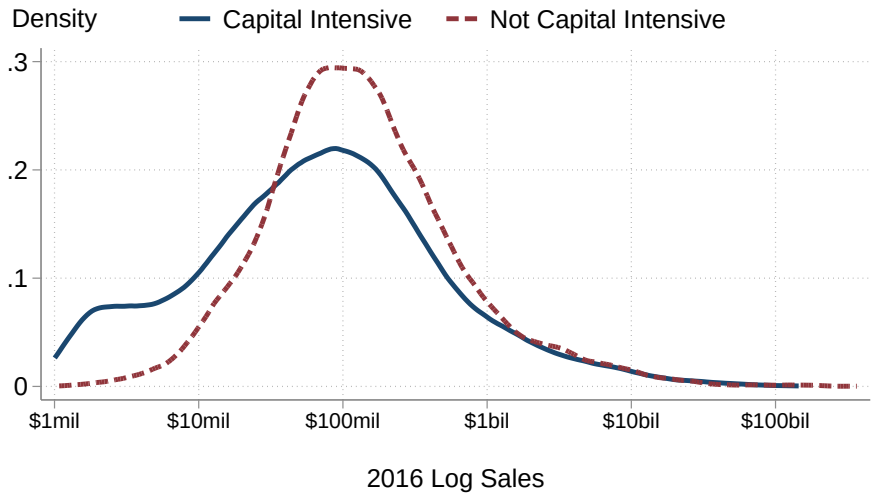


Notes: Panels A and B show the sample distribution of statutory marginal income tax rates for C corps and S corps, respectively, before and after TCJA.

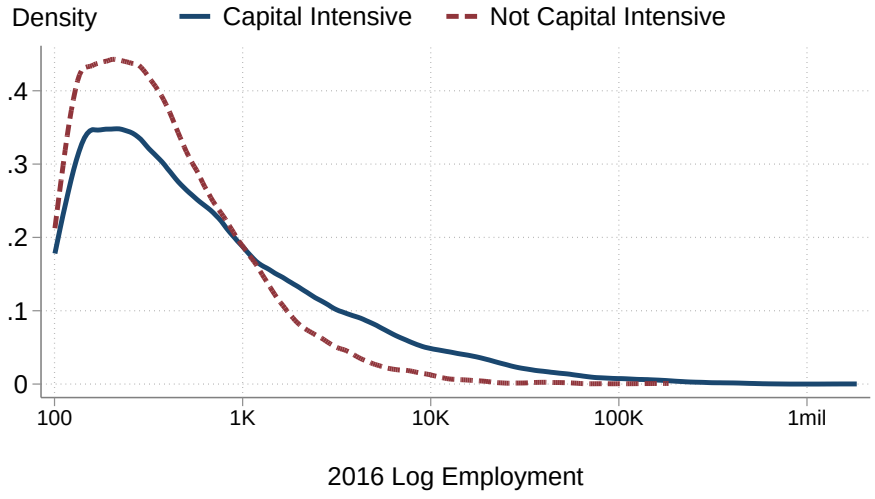
B.3 Size Distribution of Capital-Intensive Industries

Appendix Figure 6: Size Distributions of Firms, by Capital Intensity

Panel A: 2016 Sales



Panel B: 2016 Employment



Notes: Panels A and B show the distribution of 2016 log firm sales and employment, respectively, for capital-intensive and non-capital-intensive firms in the sample.

C Appendix to Section 4: Empirical Results

C.1 Equity and Debt Issuance

APPENDIX TABLE 2: EQUITY AND DEBT ISSUANCE

	(1) New Equity (0/1)	(2) Log New Equity	(3) New Debt (0/1)	(4) Log New Debt
C × Post	-0.002	0.090	0.006	0.001
	(0.005)	(0.109)	(0.007)	(0.010)
2016 Outcome Mean	0.27	1.06	0.60	3.67
Firm FE	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes
R2	108430	26139	108430	108027
N	15,490	5,817	15,490	15,484

Notes: Table shows results from estimating equation 2 to assess if TCJA caused increases in equity or debt issuance of C corps relative to S corps. Columns 1 and 3 show the extensive margins, and columns 2 and 4 show the intensive margins.

C.2 Bonus Depreciation Exposure and Additional Investment Results

Exposure to Accelerated Depreciation Policy

APPENDIX TABLE 3: EXPOSURE OF C AND S CORPS TO BONUS DEPRECIATION

	(1)	(2)	(3)	(4)
C Corp	-0.0017	-0.0017	-0.0019	-0.0020
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Outcome Mean	0.871	0.871	0.871	0.871
FE	None	Industry	Size	Industry-Size
R2	0.00	0.08	0.00	0.10
N Firms	14,849	14,849	14,849	14,849
N	55,396	55,396	55,396	55,396

Notes: Table reports regressions of the present discounted value of an additional dollar of accelerated capital deductions, constructed at the firm-level and following Zwick and Mahon (2017), on an indicator for C corps in the pre-period. Standard errors clustered by firm. The outcome is calculated by first applying a 7 percent discount rate to each property classification category's deduction schedule from IRS publication 946, and then computing firm-level weighted averages of deduction values, where the weights are given by each firm's share of eligible investment in each property classification from IRS Form 4562. Standard errors clustered by firm. Relative to the outcome means reported in the table, the results indicate precise zeros.

New Investment by Asset Life

APPENDIX TABLE 4: NEW INVESTMENT

	(1)	(2)	(3)	(4)
	Total	Short-Life	Long-Life	Structures
C $\times$ Post	0.0049	0.0043	0.0002	0.0004
	(0.0021)	(0.0014)	(0.0005)	(0.0011)
2016 Outcome Mean	0.06	0.04	0.00	0.01
Firm FE	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes
R2	0.59	0.64	0.49	0.37
N	108,430	108,430	108,430	108,430
N Firms	15,490	15,490	15,490	15,490

Notes: New investment is defined as the sum of capital expenditures reported on IRS Form 4562. These tax forms include information on firms' purchases of new capital assets such as machinery, computers, vehicles, office furniture, and structures. Firms report these investments according to the lifespan of the investment, which affects the horizon of capital tax deductions available to the firm. We decompose new investment into "short-life" equipment with depreciation schedules of less than or equal to 10 years (such as light machinery, computers, and vehicles), "long-life" equipment with longer depreciation schedules (such as heavy machinery), and structures (such as new factories or office buildings). Outcomes scaled by baseline sales. Standard errors clustered by firm.

C.3 Market-Level Analyses

Discussion of General Equilibrium and Market-Level Forces

Our firm-level empirical analysis leverages the fact that C and S corps on average received differently sized tax cuts to identify causal effects. However, in the firm-level difference-in-differences design, it is possible that general equilibrium effects, operating through market-level adjustments impacting both C and S corps, are absorbed by the industry-size-year fixed effects. In this case, firm-level "micro" elasticities may diverge from market-level "macro" elasticities. In principle, the firm-level elasticity captures the effect of exogeneously treating a single firm within a market relative to other firms, whereas the market-level elasticity captures the effect of treating some non-trivial (sales or employment- weighted) share of firms in a market, relative to other markets where different shares of firms are treated.

In theory, market-level elasticities could be either larger or smaller than firm-level elasticities. Consider the effects of corporate tax cuts on investment and profits. At the firm level, we estimate that C corps increased their investment and pre-tax profits relative to S corps following TCJA. However, if the supply of capital is constrained, it is possible that investors may divert investment away from S corps and toward C corps in response to the tax cut. Deploying a higher stock of productive capital, C corps may then increase their pre-tax profits at the expense of competitor S corps. In this case, the market-level investment and profit elasticities would be smaller than the corresponding firm-level elasticities, because increases in investment and profits for C corps are offset by declines for S corps.

In the case of workers' wages, if corporate tax cuts lead firms to increase labor demand, and if workers are perfectly substitutable across firms, then the wages of both C and S corp workers would increase by an equal amount. In this case, the market-level earnings elasticity would be positive, even as the firm-level earnings elasticity is zero.

Evidence on Market-Level Adjustments

Estimating the market-level effects of corporate tax cuts in our setting is empirically challenging, for several reasons. First, the empirical variation in corporate tax cuts at the market level is generally smaller than at the micro level: sharp policy variation in tax changes *within* industries often nevertheless yields attenuated policy variation in tax changes *across* industries. The attenuated policy variation, as well as the smaller number of observations (e.g., fewer industries than firms), reduces statistical precision. Second, the parallel trend assumption necessary to estimate a market-level elasticity is more challenging to defend at the market level than at the firm level. For example, while it may be plausible to suppose that firms within the same

industry-size bin are subject to common supply and demand shocks, it may be less plausible to suppose that different industries provide suitable counterfactuals for causal inference. Third, general equilibrium effects often unfold over longer time horizons, but our study focuses on short-run responses. These challenges limit our ability to precisely estimate market-level effects. Nevertheless, we consider three forms of evidence that may be informative: time series evidence, market-level aggregations, and data on worker flows across sectors.

First, we consider the time-series evidence. Figure 7 reports mean outcomes in levels for C and S corps in our sample, without any fixed effects or controls. Guided by the discussion of economic forces described above, we focus on four key outcomes: mean and median worker earnings; pre-tax profits, and investment. Panels A and B do not suggest evidence of trend breaks consistent with the predictions of a perfect competition labor market; that is, the plots do not show a jump in earnings for workers of both C and S corps following TCJA, relative to the pre-TCJA trend. Moreover, Panels C and D do not suggest obvious evidence of a reallocation of profits or investment from S to C firms — that is, profits and investment of S firms do not decline (relative to trend) at the same time that profits and investment increase for C corps. This evidence does not rule out that such general equilibrium effects were present, but it does suggest that GE effects were likely economically small over our sample horizon.

Second, to further investigate general equilibrium responses, we implement a market-level analysis. To do so, we construct market-level tax shocks, defined as the sales-weighted marginal tax rate of firms within the same NAICS3 industry or corporate entity type (C or S). We then instrument for the log net-of-tax MTR shock with the sales-weighted share of C corps within each market. The structural and first-stage equations, respectfully, are given by:

$$\ln y_{mt} = \varepsilon_t \ln(1 - \tau_{mt}) + \gamma_m + \alpha_t + \epsilon_{it} \tag{17}$$

$$\ln(1 - \tau_{mt}) = \lambda C_m * Post + \gamma_m + \alpha_t + \epsilon_{it} \tag{18}$$

where y_{mt} indexes outcomes in market m in year t; C_m is the pre-TCJA sales-weighted market-level share of C corps in a market (always exactly equal to 0 or 1 at the entity level, and ranging between at the industry level); $Post$ is an indicator equal to 1 for years $\geq$2018; γ_m is a market fixed effect; and α_t is a year fixed effect. The coefficients ε_t capture the market-level elasticity of the outcomes with respect to the log net-of-tax MTR change in year t. The fixed effects γ_m and α_t control, respectively, for time-invariant market characteristics and market-invariant

time trends correlated with the outcome. Standard errors are clustered by market.

The results and the implied net-of-tax elasticities, ε^{NTR}, are reported in Table 5. Although the elasticities are imprecisely estimated, the magnitudes for profits and investment are within the confidence interval of the firm-level elasticities, consistent with the notion that any market-level adjustments were likely economically small over our time horizon.

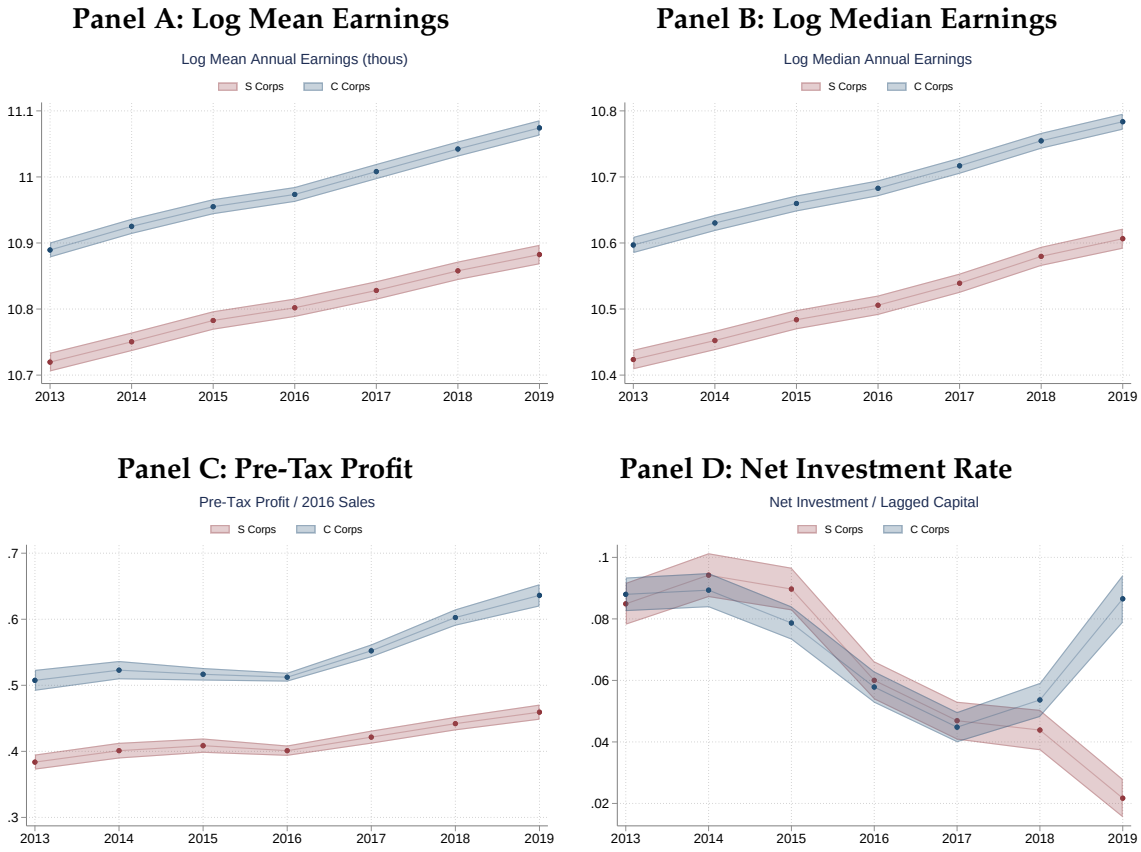
Lastly, we leverage the W2 data to explore the reallocation of workers across sectors of employment. While we cannot directly infer the counterfactual allocation of profits or investment from the corporate tax returns, the W2 data do allow us to observe workers' employment histories, and thus to directly observe the reallocation of labor across sectors after TCJA.

To do so, in Panel A of Table 6 we report the share of newly hired workers in C and S corps that were previously employed (or not) in other sectors, before and after TCJA. Column 1 shows the share of newly hired workers at a C corp that were previously employed at a different C corp (or S corp workers that were previously employed a different S corp). Column 2 indicates the share of newly hired C corp workers that were previously hired at an S corp, and Column 3 reports the converse. Column 4 reports the share of new hires that were previously employed outside the corporate sector (for example, in the non-corporate pass-through, non-profit, or public sectors). Column 5 reports the share of new hires who did not have a W2 in the previous year (for example, individuals who were self-employed or out of the labor force). The shares sum to one across the rows. Panel B reports results from estimating equation 2 using these shares as outcomes, where the regression is weighted by the number of newly hired workers at each firm. For ease of interpretation, we multiply the outcome in Panel B column 3 by -1 so that a negative coefficient on $C \times Post$ implies a decline in worker flows from C to S corps.

The negative and statistically significant coefficient in column 1 of Table 6 Panel B implies that, after TCJA, newly hired C corps workers were less likely to come from other C corps. The negative and significant coefficient in column 3 implies that C corps workers were less likely to move to S corps. The positive and significant coefficients in columns 2 and 4 imply that workers were more likely to move to C corps from S corps or from the non-corporate sector, respectively. The small and statistically insignificant coefficient in column 5 implies that newly hired C corp workers were not more or less likely to have previously been self-employed or out of the labor force before versus after TCJA. Overall, this evidence suggests that aggregate employment gains from the tax changes were likely to have been modest, because workers were primarily

reallocated from other sectors of the economy into the corporate sector.

APPENDIX FIGURE 7: TIME SERIES EVIDENCE FOR C AND S CORPS



Notes: Figure plots mean outcomes for C and S corps over the sample period, without fixed effects or controls.

APPENDIX TABLE 5: MARKET-LEVEL ELASTICITIES

Panel A: Industry-Level Elasticities

	(1) $\ln(1-\tau)$	(2) $\ln \pi$	(3) $\ln \pi(1-\tau)$	(4) I_t/K_{t-1}
$C_m \times Post$	0.075			
	(0.021)			
$\ln(1-\tau_{mt})$		0.390	0.304	0.448
		(1.249)	(1.240)	(0.362)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	616	616	616	616

Panel B: Entity Type-Level Elasticities

	(1) $\ln(1-\tau)$	(2) $\ln \pi$	(3) $\ln \pi(1-\tau)$	(4) I_t/K_{t-1}
$C_m \times Post$	0.079			
	(0.016)			
$\ln(1-\tau_{mt})$		0.511	0.584	0.889**
		(0.429)	(0.494)	(0.266)
Entity Type FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	14	14	14	14

Notes: The unit of analysis in Panel A is an industry-year. The unit of analysis in Panel B is an entity-type year (i.e., outcomes are aggregated for all C and S corps, respectively). The tables estimate equations 17 and 18, instrumenting the sales-weighted log net-of-tax rate with the pre-TCJA sales-weighted share of C corporations in the market. The outcomes in columns 1-4 are the log net-of-tax rate, log pre-tax profits, log after-tax profits, and the net investment rate, respectively. See above for details.

APPENDIX TABLE 6: WORKER TRANSITIONS

Panel A: New Hires, Raw Data

Firms	Period	(1)	(2)	(3)	(4)	(5)
Firms	Period	Same-Same	S-C	C-S	Noncorp-Corp	NoW2-Corp
S Corps	Pre-TCJA	0.229	0.000	0.290	0.234	0.247
	Post-TCJA	0.241	0.000	0.286	0.233	0.240
C Corps	Pre-TCJA	0.359	0.175	0.000	0.235	0.231
	Post-TCJA	0.346	0.187	0.000	0.245	0.221

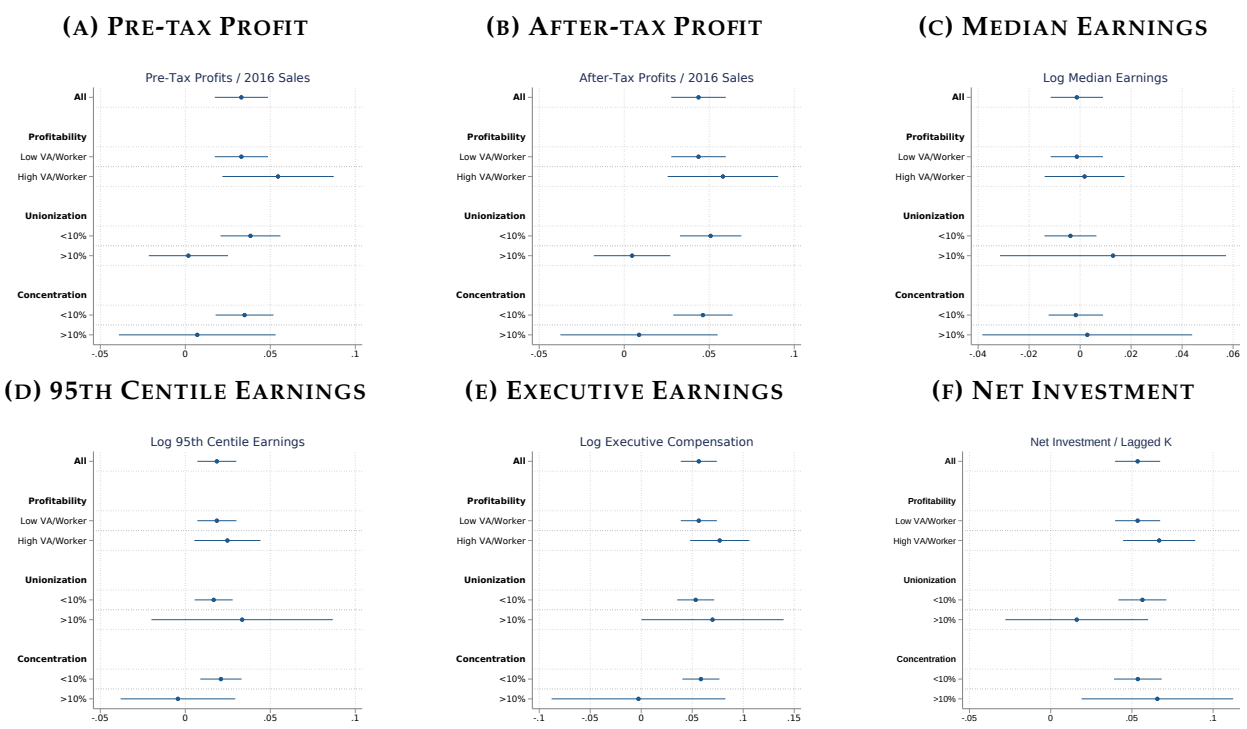
Panel B: Difference-in-Differences Estimates

	(1)	(2)	(3)	(4)	(5)
	Same-Same	S-C	C-S	Noncorp-Corp	NoW2-Corp
C × Post	-0.023	0.009	-0.007	0.011	-0.003
	(0.003)	(0.001)	(0.003)	(0.005)	(0.003)
Firm FE	Yes	Yes	Yes	Yes	Yes
Industry-Size Fe	Yes	Yes	Yes	Yes	Yes
R2	0.75	0.84	0.95	0.66	0.91
N Firms	15,490	15,490	15,490	15,490	15,490
N	108,213	108,213	108,213	108,213	108,213

Notes: Panel A reports the shares of newly hired workers in C and S corps that were previously employed (or not) in other sectors, before and after enactment of TCJA. Column 1 indicates the share of newly hired workers at a C corp that were previously employed at a different C corp (or S corp workers previously employed at a different S corp). Column 2 indicates the share of newly hired C corp workers that were previously hired at an S corp, and Column 3 reports the converse. Column 4 reports the share of new hires that were previously employed outside the corporate sector (for example, in the pass-through, non-profit, or public sectors). Column 5 reports the share of new hires who did not have a W2 in the previous year (for example, individuals who were self-employed or out of the labor force). The shares sum to one across the rows. Panel B reports results from estimating equation 2 using these shares as outcomes. The shares in Panel B column 3 are multiplied by -1 so that a negative coefficient is interpreted as a decline in worker flows from C to S corps.

C.4 Firm Heterogeneity

Appendix Figure 8: Additional Firm Heterogeneity



Notes: The unit of analysis is a firm-year. The figure reports heterogeneity in the net-of-tax elasticities from equation 4 for different samples of firms. The specifications include firm and sector-year fixed effects. Profitability is defined as value added per worker in the pre-period, and the sample is split at the median. Unionization rates are estimated at the industry level using data from the Current Population Survey. We approximate market shares as the share of sales by the firm in an industry.

C.5 The Cost of Capital and Elasticities with Respect to Effective Marginal Tax Rates

We use a model of the corporate income tax based on theoretical work by Auerbach and Hassett (1992) and using data from Foertsch (2018). The Auerbach-Hassett model can flexibly incorporate salient features of firm behavior and of the U.S. business tax provisions before and after TCJA, including: forward-looking expectations; adjustment costs in investment; different tax rates on the income of shareholders of C versus S corps, including individual-level taxes on dividends, capital gains, interest income, and distributions of non-qualified annuities; the expansion and phase-out of bonus depreciation, as well as incomplete take-up of bonus; and the sunsetting of the QBI deduction. In the model, firms optimize the present discounted value of after-tax profits:

$$\max \mathbb{E}\left\{ \sum_{s=t}^{\infty}(1+\rho)^{-(s-t)}\left[\frac{F_s(K_s,L_s))(1-\tau_s)}{(1-r)} - w_s L_s(1-\tau_s) - C_s(I_s)I_s(1-\Gamma_s)\right] + A_t \right\} \tag{19}$$

where $\mathbb{E}$ is the expectations operator; ρ is the shareholders' discount rate; $F(K,L)$ is the firm's production function, which uses capital and labor as inputs; τ is the corporate income tax rate, which varies for C and S corps; r is the risk-free rate of return; w is the market wage, which may be generalized to include several types of workers and corresponding wage rates; I is new investment net of depreciation; $C(I)$ is a quadratic convex investment cost function capturing adjustment costs; Γ is the present discounted value of savings due to investment tax credits k and depreciation allowances:

$$\Gamma_s = k_s + A_s$$

and where A is the present discounted value of tax benefit from investment depreciation allowances D per dollar of investment:

$$A_s = \sum_{z=s}^{\infty}(1+r)^{-s(z-s)}\tau_s D_{z-s}$$

We assume that $F(K,L)$ varies across firms due to heterogeneous productivities, such that some firms are able to produce greater output than others given a fixed set of inputs. The first-order condition for profit maximization with respect to capital yields:

$$\underbrace{\frac{\partial F_s}{\partial K_s}}_{\text{MRPK}} = \underbrace{\left(\frac{(1-\Gamma_s)}{1-\tau_s}\right)\left(\frac{r+\delta+(\Gamma_{s+1}-\Gamma_s)}{1-\Gamma_s}\right)}_{\text{user cost of capital}} \equiv \phi_s \tag{20}$$

Auerbach-Hassett show that, in the presence of adjustment costs, optimization implies that firms' investment is a function of a weighted average of current and future user costs, given by:

$$\phi_t = \sum_{s \geq t} w_{s-t} \phi_s \tag{21}$$

where ϕ_s is the user cost of capital in period s, and w_{s-t} represents weights that sum to one and reflect adjustment costs. If adjustment costs are low, the weights assigned to future periods are low, and current investment is less sensitive to future user costs. Conversely, if adjustment costs are high, then the weights assigned to future periods are high, and investment is highly responsive to future user costs.

Foertsch (2018) parameterizes equation 20 separately for C corporations and pass-through businesses (including S corps) for 54 NAICS industry codes. Here we broadly summarize the methodology and refer readers to that article for exhaustive details. The data are from the Bureau of Economic Analysis (BEA) and cover 76 distinct depreciable assets (covering both equipment and structures), land, inventories, and intangibles (such as research and development, advertising, and artistic works). Foertsch then computes user costs at the entity type-level weighting by asset type and by industry, and computes effective marginal tax rates as follows:

$$EMTR_t = \frac{\phi_t - S}{\phi_t} \tag{22}$$

where S is a weighted average of the after-tax return on corporate equity and corporate debt. Effective marginal tax rates (EMTR's) measure the difference between the pre-tax and after-tax return on an investment, divided by the pre-tax return. In theory, a higher EMTR implies a larger distortion on firms' investment decisions. Foertsh (2018) reports EMTR's separately for C corps and pass-through firms for each year in the ten-year period from 2018-2027, as well as EMTR's in a counterfactual scenario where TCJA was not enacted. Cohen, Hansen, and Hassett (2002) formulate the weights in Equation 21 using the parameter Ω:

$$w_0 = 1 - \Omega \tag{23}$$

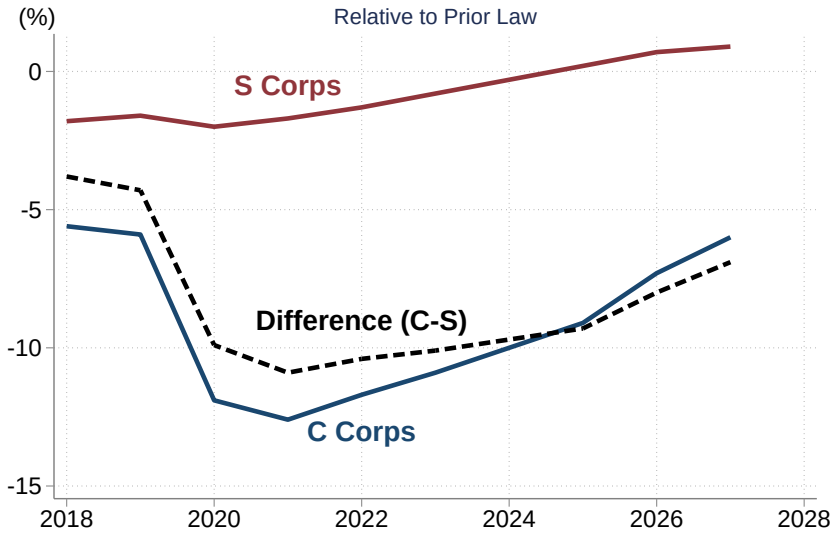
$$w_{s-t} = w_{s-t-1} * \Omega, \forall s > t$$

such that $\sum_{s \geq t} w_{s-t} = 1$. The expression implies that, if $\Omega = 0.5$, the weights in each successive year are half as large as the prior year, and the successive year's user costs are half as important.

To estimate elasticities with respect to effective marginal tax rates, we use the actual and counterfactual (that is, pre-TCJA) EMTR's reported by Foertsch and, as in the baseline case of Cohen, Hansen, and Hassett (2002), apply an adjustment cost parameter of $\Omega = 0.5$. We also perform sensitivity analyses using Ω values of 0.3 (low adjustment costs) and 0.7 (high adjustment costs). Finally, we compute the TCJA shock to EMTR's separately for C and S corps as the difference in the resulting actual and counterfactual EMTR's, and estimate corresponding net-of-tax elasticities using equation 4.

The first row of Table 7 reports our benchmark net-of-tax elasticities using the marginal income tax rates reported in the main text. Rows 2-4 report elasticities with respect to the (net-of) effective marginal tax rates, computed as described above, and varying the adjustment cost parameter. In the baseline adjustment cost case, $\Omega = 0.5$, the resulting elasticities are nearly identical to the benchmark elasticities reported in the main text (and in row 1). In the case with low adjustment costs, $\Omega = 0.3$, the elasticities are modestly higher. The modestly higher elasticities reflect that the tax wedge between C and S firms in the years immediately following TCJA was smaller relative to the middle and latter end of the ten-year window, when the bonus expensing provisions are scheduled to phase out and several individual provisions (including the QBI) are scheduled to sunset. In this case, the reduced form coefficients (from equation 2) will be scaled by a smaller first-stage coefficient (from equation 3), generating a larger elasticity. The reverse holds for the high adjustment cost case where $\Omega = 0.7$, generating modestly smaller elasticities. In all cases, the estimated elasticities with respect to effective marginal tax rates remain within the confidence intervals of the benchmark estimates.

APPENDIX FIGURE 9: CHANGES IN EFFECTIVE MARGINAL TAX RATES



Notes: Figure shows changes, relative to prior law, in the 10-year path of expected effective marginal tax rates. Estimates are constructed from the cost of capital equation 20 and the implied EMTR equation 22 using data from Foertsch (2018). See above for details.

APPENDIX TABLE 7: NET-OF-TAX ELASTICITIES

Specification	(1) ε^{B}_{π} π	(2) $\varepsilon^{\pi}_{\pi(1-\tau)}$ $\pi(1-\tau)$	(3) $\varepsilon^{w_{p50}}$ p50 w	(4) $\varepsilon^{w_{p50}}$ p95 w	(5) $\varepsilon^{w_{exec}}$ Exec w	(6) $\varepsilon^{I}_{I_t/K_{t-1}}$ I_t/K_{t-1}
Benchmark	0.455	0.612	-0.008	0.200	0.692	0.445
	(0.110)	(0.112)	(0.056)	(0.064)	(0.142)	(0.070)
$\Omega = 0.5$	0.419	0.563	-0.008	0.184	0.679	0.410
	(0.098)	(0.099)	(0.052)	(0.058)	(0.136)	(0.063)
$\Omega = 0.3$	0.523	0.702	-0.010	0.230	0.847	0.511
	(0.123)	(0.124)	(0.064)	(0.072)	(0.169)	(0.078)
$\Omega = 0.7$	0.332	0.447	-0.006	0.146	0.539	0.325
	(0.078)	(0.079)	(0.041)	(0.046)	(0.108)	(0.050)
N	108,430	108,430	108,430	108,430	108,430	108,430

Notes: Row 1 reports benchmark net-of-tax elasticities using the marginal income tax rates reported in the main text. Rows 2-4 report elasticities with respect to the (net-of) effective marginal tax rates, from equations 20 and 22, and varying the adjustment cost parameter, Ω. See above for details.

D Appendix to Section 5: Revenue, Welfare, and Incidence

D.1 Revenue and Welfare Estimates for C Corporations Only

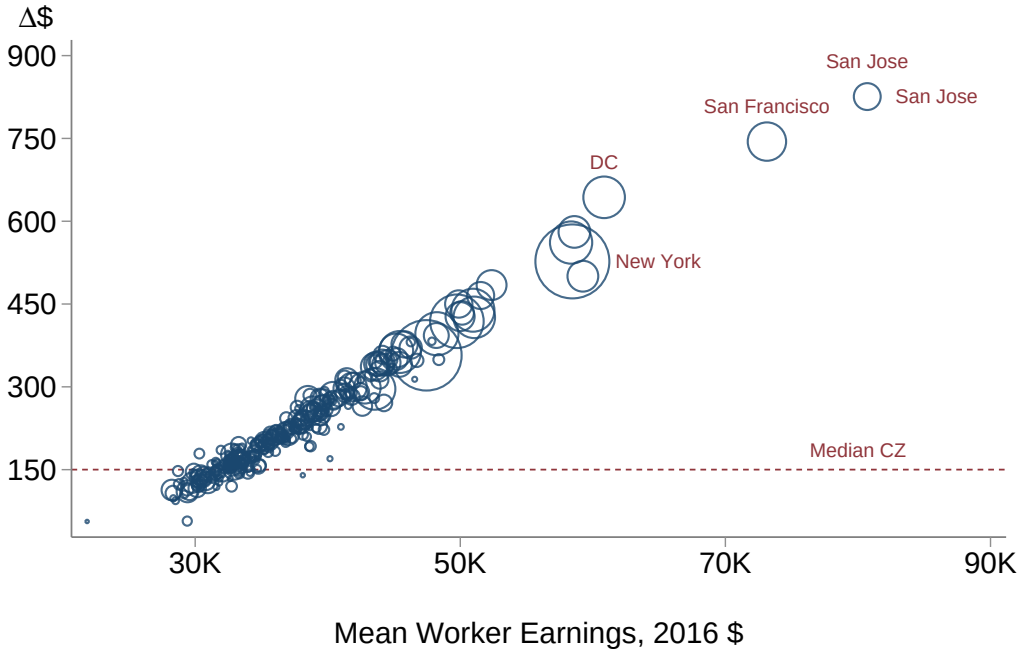
APPENDIX TABLE 8: REVENUE AND WELFARE ESTIMATES

	2016 USD		GDP Share	
	bil $	(se)	%	(se)
Panel A: Tax Revenues				
Mechanical, dM	-91		-0.43	
Total, dT	-77	3	-0.36	0.01
Panel B: After-Tax Private Income				
Total Income, dY	109	23	0.51	0.11
Capital Income, $d\pi^K$	56	10	0.26	0.05
Labor Income, $d\pi^L$	54	20	0.25	0.09
Panel C: Welfare and Excess Burden				
Welfare, dW	32	24	0.15	0.11
Marginal Excess Burden, dW/dT	.41	.33		

Notes: Table shows estimated revenue, income, and welfare impacts from TCJA's changes in corporate income tax rates only on C corporations. Outcomes are scaled in billions of dollars in column 1. Outcomes in column 2 are scaled as a percentage of GDP. Standard errors constructed from 1,000 bootstrap simulations of the estimated parameters are shown in parentheses. The change in mechanical revenue is computed from equation 7, and the total change in revenue is computed from equation 9. The change in capital income is computed from equation 11, and the change in labor income is computed from equation 10. The change in welfare dW is defined as the sum of the changes in private income dY and tax revenue dT. The marginal excess burden is defined as the ratio of the change in welfare to the change in tax revenues. See Section 5 for details.

APPENDIX FIGURE 10: GEOGRAPHIC INCIDENCE

APPENDIX FIGURE 11: CHANGE IN PER CAPITA INCOME VS. INITIAL WORKER EARNINGS

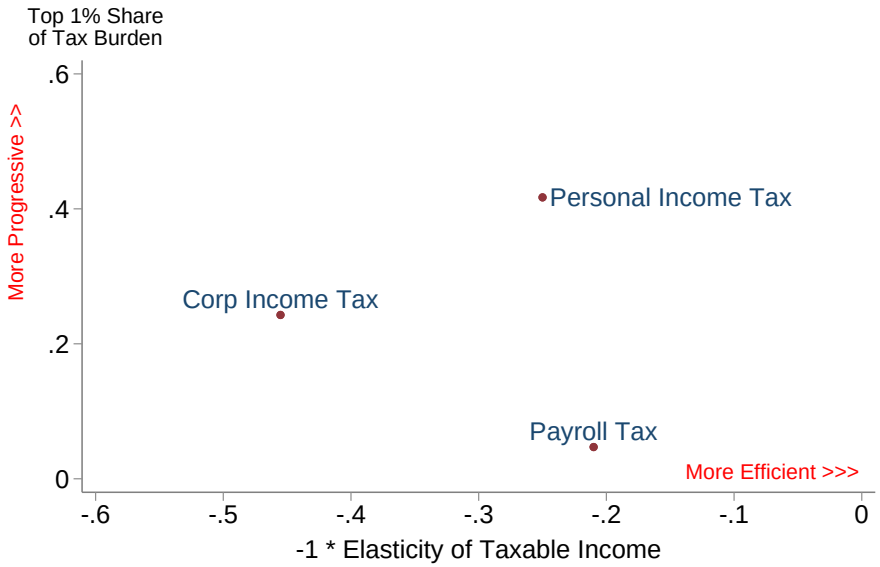


Notes: The unit of analysis is a commuting zone. The figure plots the estimated change in income for each commuting zone against the 2016 average earnings of corporate-sector workers. The size of the bubbles is proportional to the 2016 population of each commuting zone.

D.2 The Efficiency-Equity Tradeoff

This appendix reproduces Figure 11 using a more extreme measure of equity, the share of the tax burden borne by the top 1%.

APPENDIX FIGURE 11: THE EFFICIENCY-EQUITY TRADEOFF IN CONTEXT



Notes: The figure contextualizes our results on the corporate income tax against the personal income and payroll taxes, the two other largest sources of federal tax revenue in the United States. The elasticity of the tax base, shown on the X-axes, is a measure of the market value of the tax distortions. The share of tax burden borne by the top of the income distribution is a measure of progressivity. The ETI estimates for the personal income and payroll tax are from Saez et al. (2012) and Saez et al. (2019), respectively, and the progressivity estimates are from CBO (2021).