Supplemental Appendix

"Corporate Tax Cuts, Firm Growth and Workers' Earnings"

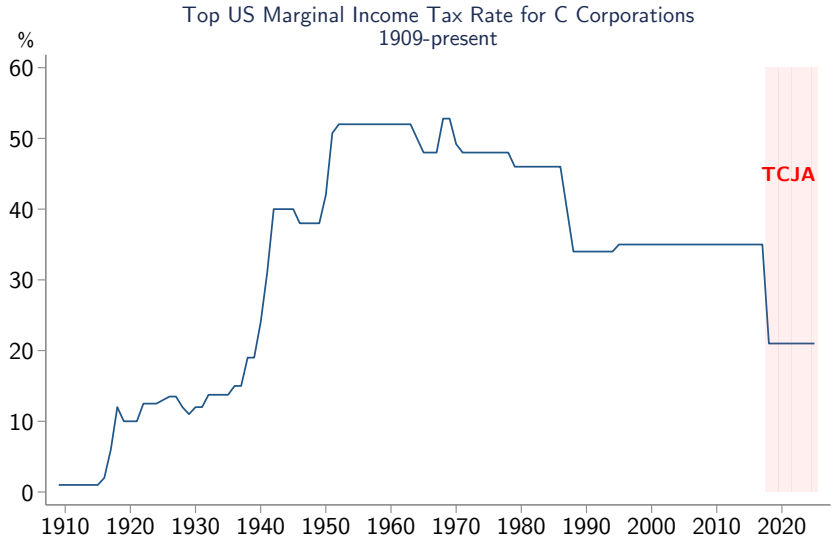
Kennedy, Dobridge, Landefeld, and Mortenson

A Appendix to Section I: Setting and Institutional Details

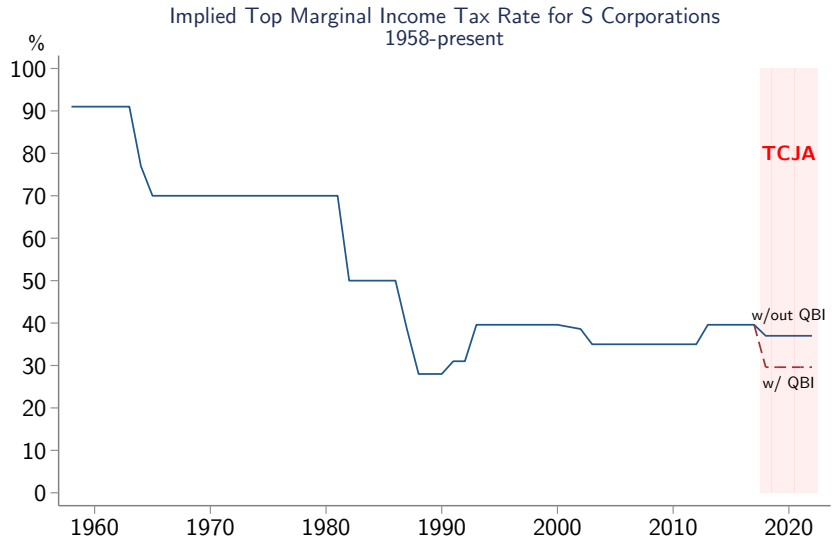
A.1 Historical Statutory Federal Top Marginal Income Tax Rates

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 are from Tax Foundation 2020a, 2020b. Panel A shows the evolution of the top statutory marginal corporate income tax rate facing C corporations since 1958. Panel B shows the implied top statutory marginal income tax rate facing S corporations, which is equal to the top federal 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	0.916	0.659	0.477
1	50,000	0.15	0.21	0.061	0.026	0.012
2	75,000	0.25	0.21	0.006	0.006	0.004
3	100,000	0.34	0.21	0.003	0.004	0.002
4	335,000	0.39	0.21	0.007	0.013	0.010
5	10,000,000	0.34	0.21	0.005	0.043	0.047
6	15,000,000	0.35	0.21	0.000	0.008	0.009
7	18,000,000	0.38	0.21	0.000	0.003	0.005
8	>18,000,000	0.35	0.21	0.001	0.240	0.433

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

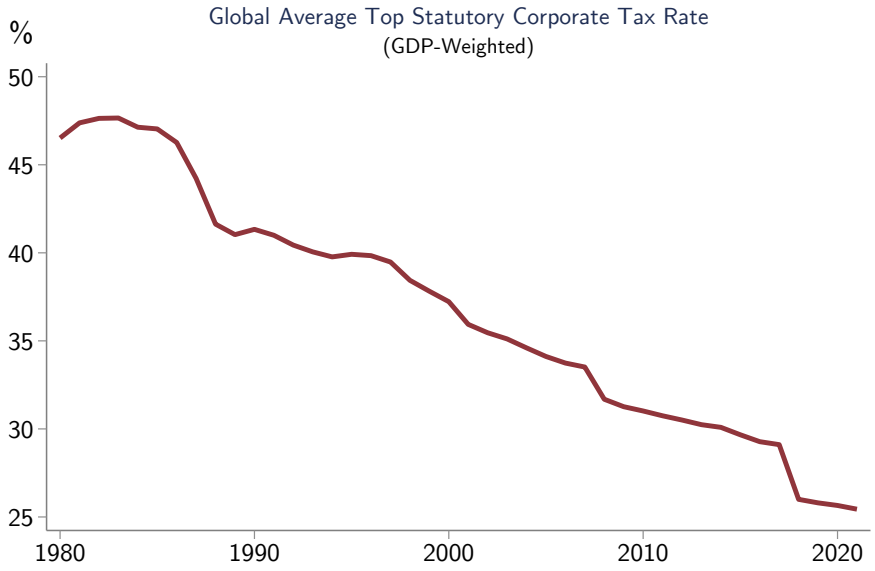
Income Bracket	Upper Income Threshold 2017 ($)	2017 MTR	Upper Income Threshold 2019 ($)	2019 MTR
1	18,650	.1	19,400	.1
2	75,900	.15	78,950	.12
3	153,100	.25	168,400	.22
4	233,350	.28	321,450	.24
5	416,700	.33	408,200	.32
6	470,700	.35	612,350	.35
7	>470,700	.396	>612,350	.37

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.

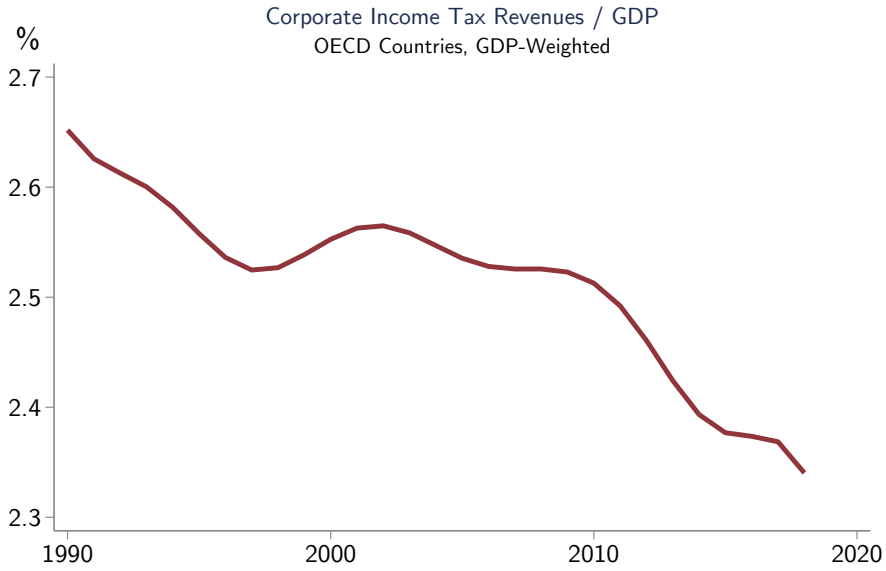
A.3 Global Perspective on Corporate Income Taxes

Appendix Figure 2: Corporate Taxes in Global Perspective

Panel A: Average Global Corporate Tax Rates



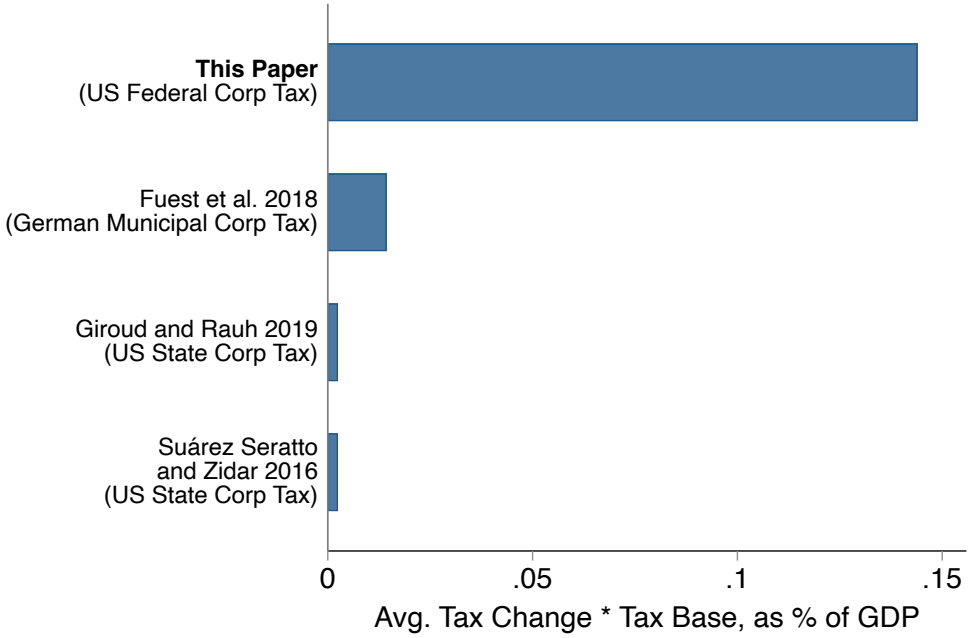
Panel B: Average Corporate Income Taxes in OECD Countries as a Share of GDP



Notes: Panel A shows the GDP-weighted global average top statutory corporate income tax rate since 1980, using data from Tax Foundation (2021) and World Bank (2025). Panel B shows the lowess-smoothed GDP-weighted ratio of corporate income tax revenues to GDP since 1990 for OECD countries, using data from OECD (2022). 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), and the unconditional average tax change is 9 percentage points.

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 owners of S corporations, as well as other pass-through businesses not included in the analysis sample, and is not relevant for C corporations. The deduction amount is equal to the minimum of:

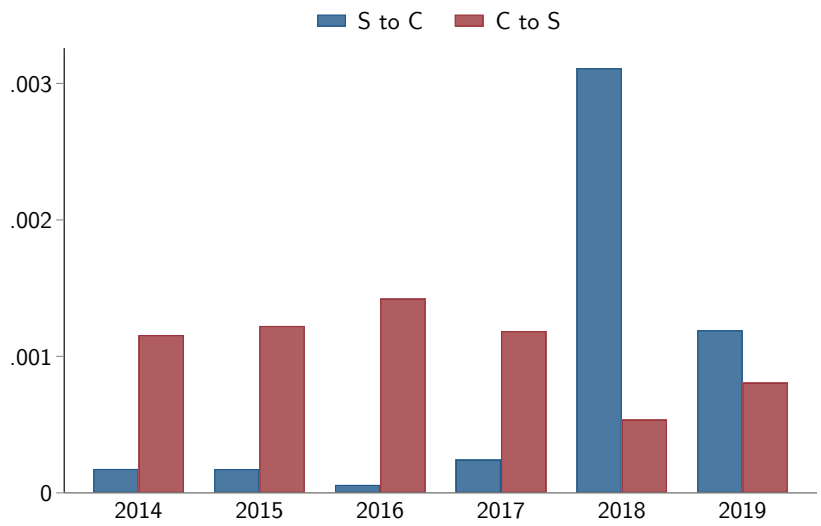
1. 20% of taxable income, where taxable income is calculated prior to assessing the QBI deduction, minus net capital gains; or,
2. The sum of both:
   (a) 20% of the aggregate qualified real estate and investment trust (REIT) dividends and publicly traded partnership (PTP) income; and
   (b) 20% of net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

Moreover, the deduction is limited for taxpayers with taxable incomes exceeding certain thresholds who receive qualified business income from businesses with certain characteristics. For tax year 2019, taxpayers with taxable income below $321,400 (married filing jointly) or $160,725 (single) are eligible for the full deduction without regard to firm-level wage or capital limitations. For taxpayers with taxable income within the phase-in range above these thresholds ($100,000 for married filers and $50,000 for single filers), the deduction is partially subject to additional limitations. For taxpayers with taxable income above the phase-in range, the deduction is subject to two constraints. First, income from specified service trades or businesses (SSTBs) is ineligible for the deduction. Second, the deduction is limited to 20 percent of QBI, capped at the greater of (i) 50 percent of W-2 wages paid by the business or (ii) 25 percent of W-2 wages plus 2.5 percent of the unadjusted basis immediately after acquisition of qualified depreciable property.

The deduction amount is claimed by individual owners on Schedule K-1. The phase-out and eligibility restrictions imply that, within S corporations, some owners may be eligible for QBI and others may not. The QBI deduction effectively lowers the marginal business income tax rate for firm owners who can claim the deduction, and in turn lowers firms' cost of capital (i.e., it lowers τ^c_{ft} for S corps in equation 7). Properly accounting for the QBI affects the first stage of the research design (i.e., it affects the tax rate for S corps) but does not affect the reduced form.

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

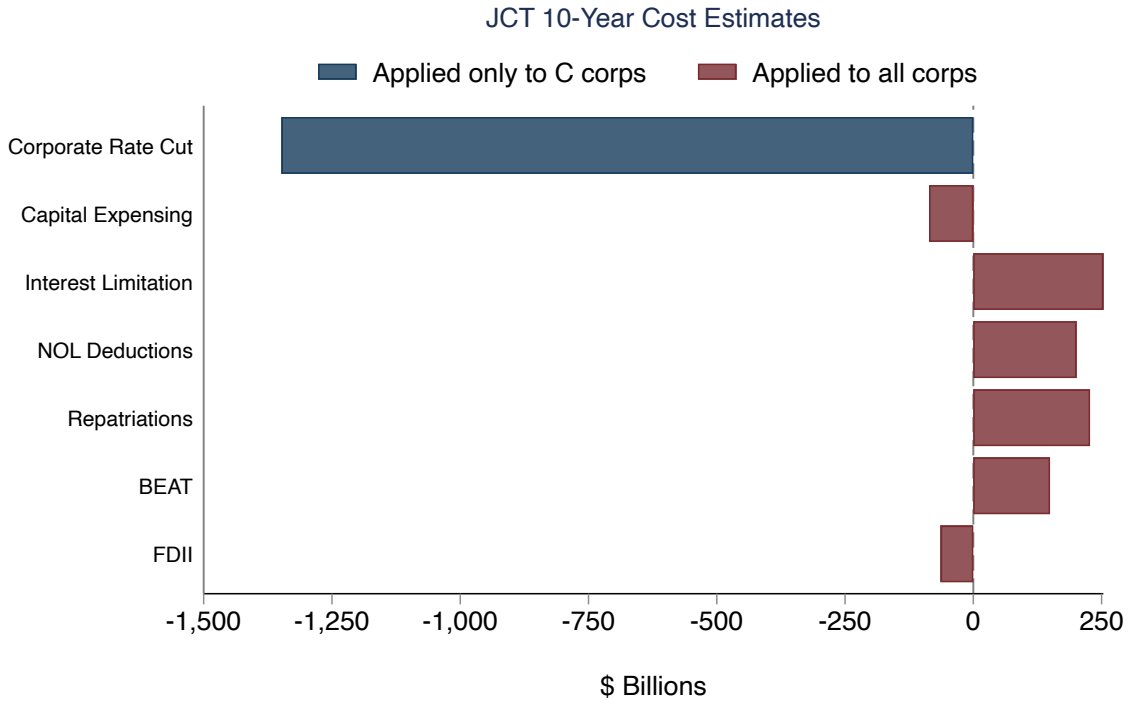
Below we briefly summarize other major provisions of TCJA affecting corporations. For more details on these reforms, see Auerbach (2018) and Joint Committee on Taxation (2018).

- **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 the DPAD, which provided a tax deduction to corporations for property manufactured, produced, extracted or grown by the taxpayer 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.

Figure 5 below plots the estimated budget impacts of each major provision over 10 years produced by Joint Committee on Taxation (2017). Among domestic firms, the corporate rate cut is the only major provision of the business tax code that applied exclusively to C corporations, and was the most expensive of these provisions. See Appendix C.11 for an empirical and theoretical

discussion of the relative importance of expensing and the tax rates in driving changes in user costs and marginal incentives.

APPENDIX FIGURE 5: ESTIMATED REVENUE IMPACTS OF MAJOR TCJA BUSINESS TAX PROVISIONS BY JOINT COMMITTEE ON TAXATION (2017)



Notes: The figure plots the estimated budget impacts of major TCJA business tax provisions over 10 years produced by Joint Committee on Taxation (2017). Among domestic firms, the corporate rate cut is the only provision of the business tax code that applied exclusively to C corporations, and was the most expensive provision of these reforms.

B Appendix to Section II: 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. Link S corp returns to K-1s; retrieve S corp owners' 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 operating profits are defined as sales minus costs of goods sold. After-tax operating profits are defined as pre-tax operating 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 are 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. When constructing measures of investment scaled by lagged capital, in a small share of observations we use lagged capital from the IRS CDW database if it is missing from the SOI files, or use two-period lagged capital if the one-period lag is missing or zero. When computing exposure to accelerated bonus depreciation, eligible investment is defined 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. We winsorize the top and bottom 5% of investment outcomes within entity-type-year bins.

Payroll, Employment, and Earnings

Worker earnings are measured for C and S corporation employees from Form W-2, box 5 (Medicare Wages). Payroll is the sum of W-2 earnings by firm and year. Employment is measured by matching firms with individuals' W-2s using the crosswalks described in JCT (2022). To increase precision and reduce measurement error due to part-time workers or tax reporting errors, we exclude workers without a valid taxpayer identification number, workers younger than 18 or older than 70, and workers in the bottom 5% of the national annual earnings distribution when computing employment counts and firm earnings centiles. Top-5 compensation is defined for C and S corporations as the average annual W-2 earnings of the top five highest paid workers at the firm in each year. 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

Firm 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 5%, 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. NAICS industry codes are defined using the code reported by the firm in the first year it appears in the sample.

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.

Additional Data and Measurement Notes

In the robustness checks in Table 7, we reclassify the NAICS-6 or state of fewer than 1% of observations to prevent them from falling out the sample when using finer fixed effects than in the benchmark specification. We do so by binning observations that would otherwise be excluded from the regression into a single new industry or state bin. Excluding these observations from the sample does not change the results. When controling for pre-trends, we estimate missing values at the firm level with the average pre-trend in the same industry-size bin, or failing that, the same NAICS-3 or NAICS-2 industry. In Table 8, the NOL, 163(j), and bonus exposure variables are winsorized at the 1st/99th percentiles to improve precision and reduce the influence of outliers. In Table 7, the SOI sample is collapsed by state (or state-industry) and year; firms in Puerto Rico, Virgin Islands, and Guam are excluded due to thin coverage and to protect taxpayer privacy. More broadly, we impose minimum cell sizes of at least 20 firms and 50 employees to protect taxpayer privacy. While it is legally possible for an S corp to own a C corp, this occurs in only 0.17% of observations in the sample and dropping them does not influence the results. C corps cannot own S corps.

Sample Restrictions

The Corporate SOI files from 2013-2019 begin with approximately 642,000 firm-year observations. Dropping firms with less than $1 million or greater than $10 billion in sales reduces the sample to 397,000. Dropping firms with fewer than 10 employees reduces the sample to 312,000. Dropping firms with non-positive capital and expenses reduces the sample to 299,000. Dropping multinational firms reduces the sample to 265,000. Dropping public firms reduces the sample to 254,000. Dropping firms that switch entity types reduces the sample to 247,000. Dropping singletons from the fixed effect regressions yields the final analysis sample of 231,360 firm-year observations.

B.2 Measuring User Costs

Here we provide additional details underlying the measurement of user costs in equation 7. The Hall and Jorgenson (1967) cost of capital expression is given by the following equation, here omitting subscripts for clarity:

$$\Phi = \left(r^d \Big(1 - \tau\Big) \cdot \alpha + r^e \cdot (1 - \alpha) - \rho + \delta \right) \cdot \left(\frac{\sum_k s_k (1 - \lambda z_k \tau^c)}{1 - \tau^c} \right)$$

where r^d and r^e are the nominal returns on debt and equity, respectively; α and $(1 - \alpha)$ are the share of debt vs. equity financing, respectively; s_k is the capital share with depreciation schedule k; z is the present value of deductions from bonus depreciation allowances of class k; λ is the effective share of capital investments eligible for bonus; τ^c is the marginal income tax rate (adjusted for debt and operating loss deductions, and for the QBI in the case of S corps); ρ is the inflation rate; and δ is the depreciation rate. We estimate or calibrate each of these parameters as follows, leveraging our data sample where possible and otherwise relying on estimates from the literature. The subscript f denotes firms, i denotes industries, is denotes industry-size bins, j denotes entity type (C or S), k denotes asset classes, and t denotes years. Parameters without subscripts are applied uniformly to all firms in all years.

- r^d_{ft}, the interest rate on debt, is estimated in the data at the firm-year level net interest payments divided by debt.
- r^e, the cost of equity, is calibrated to 0.089, using U.S. estimates from Damodaran (2025).
- α_{isj}, the share of debt financing, is estimated in the data at the industry-size-entity-type level as the ratio of debt to the sum of debt and equity in the pre-period. Since the firms in our sample are private, we estimate the market value of equity as in Smith et al. (2023). Those authors use Compustat data on public firms to estimate the ratios of market value to sales, market value to assets, and market value to EBITDA, all at the industry level. They

then apply those ratios to the observed firm-level values in the tax data, and estimate market value as the average of the three measures.

- z_{isjkt}, the expensing rate for eligible capital, is estimated by applying the methodology of Zwick and Mahon (2017) at the industry-size-entity-asset-type level separately in the pre-period and post-period. It is a weighted average of the present discounted value of bonus deductions, where the weights are given by firm-specific bonus-eligible asset mixes. Structures are never eligible for bonus. After TCJA, the introduction of full expensing means that $z_{isjk,t}$ is uniformly set to 1 for all bonus-eligible capital.

- λ is a scaling factor accounting for incomplete take-up of bonus. We follow Congressional Budget Office (2024) and Kitchen and Knittel (2016) in making these adjustments. Kitchen and Knittel (2016) use IRS data to document that the dollar-weighted share of claimed expensing deductions ranges from 50-70% for C and S corporations. They also document that take-up rates are correlated with firm size. Since our sample covers mid-market firms, we use a benchmark take-up rate of 60%.

- ρ, the annual inflation rate, is set to 1.5%, the average over the sample period as computed from BLS data (BLS 2024).

- δ_{isj}, the depreciation rate, is estimated in the data at the industry-size-entity-type level as depreciation scaled by lagged capital.

- $\tau^c_{f,t}$, the marginal income tax rate, is computed as follows. For C corps, the top rate is 35% before TCJA and 21% after TCJA. The top tax rate in the pre-period for C corps that claimed the DPAD deduction before it was elimiated by TCJA was 31.85%. For S corps, the top rate is 39.6% before TCJA. We empirically observe a 3.2 percentage point decline in MTRs from 2016 to 2019 for firms with positive taxable income, after accounting for DPAD deductions in the pre-period and QBI deductions in the post-period, yielding a calibrated post-TCJA rate of 36.4%. Lastly, we adjust this tax rate, which we denote as $\tau^{'}_{f,t}$, for net operating loss (NOL) deductions as follows. First, we estimate the share of NOL deductions in taxable income by industry-size bin among C corps in the pre-period, denoted as $\omega_{is,j}$. Second, to account for the favorable tax treatment of losses for S corps relative to C corps — S corp owners may immediately deduct business losses against positive income from other sources — we scale $\omega_{is,j}$ by 1.63 for S corps, equal to the aggregate S-to-C ratio of NOLs over positive business income in the pre-period.[18] Third, we compute the applicable marginal income tax rate before TCJA as $\tau^c_{f,t} = \tau^{'}_{f,t} \cdot (1 - \omega_{isj(f)})$. Fourth, we use the same formula to compute $\tau^c_{f,t}$ in the post-period, except where $\omega_{isj(f)} = \min(\omega_{isj(f)}, 0.8)$ to account for TCJA's limitation on NOL deductions, capped at 80% of taxable income.

[18]The average ratio of NOL deductions to the sum of taxable income and NOL deductions in the pre-period in the sample is 8.8% for C corps but not empirically observable for S corps on Form 1120-S, as these deductions are claimed by the individual owners on Form 1040. We estimate this ratio as 14.3% for S corps using publicly available SOI data (IRS 2025). The ratio 0.143/0.088 = 1.63. Varying the scaling factor from 1 to 2 does not significantly affect the estimates.

- $\tau^d_{f,t}$, the marginal tax benefit from interest payments on debt, is equal to the firm's marginal income tax rate in years prior to TCJA. After TCJA, deduction amounts were capped at 30% of EBITDA. Denoting debt interest costs as c and EBITDA as Y, the effective marginal tax rate on debt is given by: $\tau^d_{f,t} = \tau^c_{f,t} \cdot \min(c_f, 0.3 \cdot \max(0, Y_{f,t}))/c_{f,t}$, where firms below the interest limitation threshold deduct interest costs at the marginal income tax rate, and firms above the threshold deduct costs at a lower effective rate equal to the product of the marginal tax rate and the share of interest costs that are deductible.
- When estimating parameters in the data, we winsorize ratios at the 5th/95th percentiles (e.g., interest/debt, NOL deductions/taxable income, etc). If values of parameters are missing at the {firm, industry-size, NAICS-3 industry, NAICS-2 sector} level, then we use the average value of the parameter in the next most aggregate bin {industry-size, NAICS-3 industry, NAICS-2 sector}, in that order.

APPENDIX TABLE 2: USER COST PARAMETERS

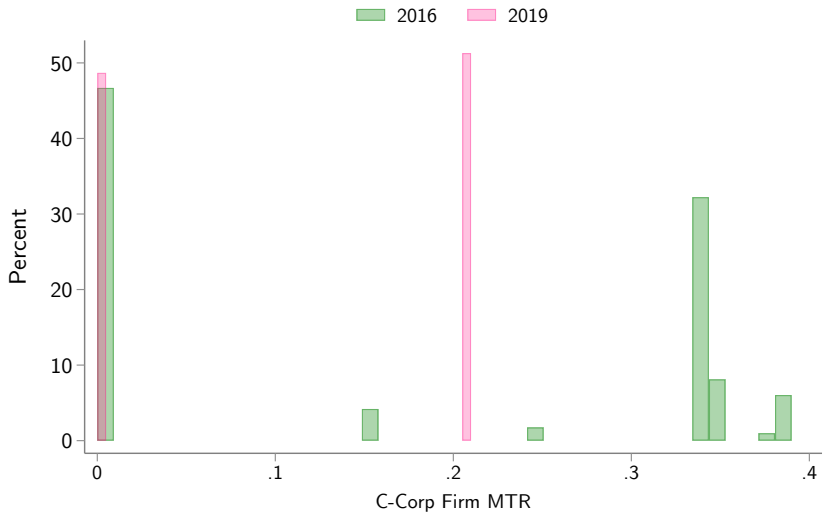
	All Firms		**C Corps**		**S Corps**	
	(1) Pre	(2) Post	(3) Pre	(4) Post	(5) Pre	(6) Post
$r^d_{f,t}$	0.031	0.031	0.030	0.028	0.033	0.035
r^e	0.089	0.089	0.089	0.089	0.089	0.089
$\alpha_{f,t}$	0.295	0.295	0.326	0.326	0.258	0.258
$z_{isj,t}$	0.733	1.000	0.740	1.000	0.726	1.000
λ_{isj}	0.600	0.600	0.600	0.600	0.600	0.600
ρ	0.015	0.015	0.015	0.015	0.015	0.015
δ_{isj}	0.048	0.048	0.050	0.050	0.046	0.046
$\tau^c_{f,t}$	0.244	0.184	0.206	0.123	0.289	0.254
$\tau^d_{f,t}$	0.244	0.234	0.206	0.182	0.289	0.294
$\phi_{f,t}$	0.132	0.119	0.130	0.114	0.134	0.125

Notes: The table reports the estimated and calibrated parameters used to measure user costs for firms in the balanced analysis sample. The table reports unconditional, unweighted means for all firms, C corps, and S corps in years pre- and post-TCJA. See above for additional measurement details.

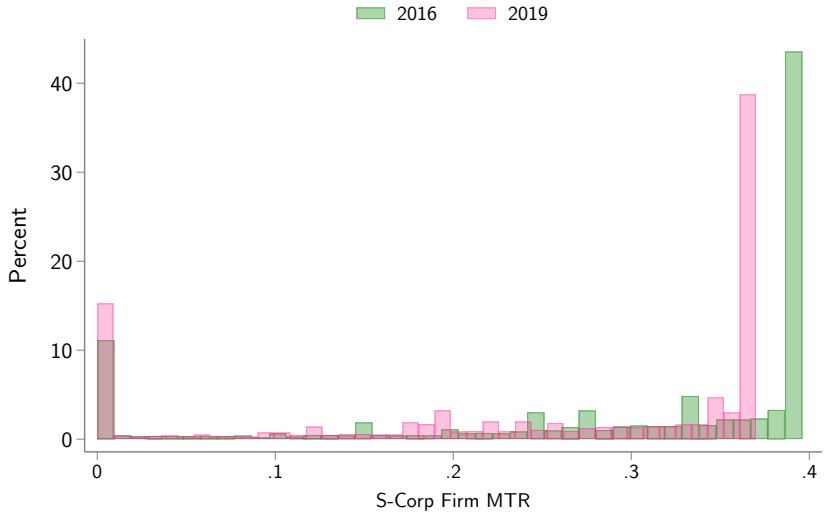
B.3 Sample Distribution of Firms' Statutory Marginal Income Tax Rates Before and After TCJA

Appendix Figure 6: 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.

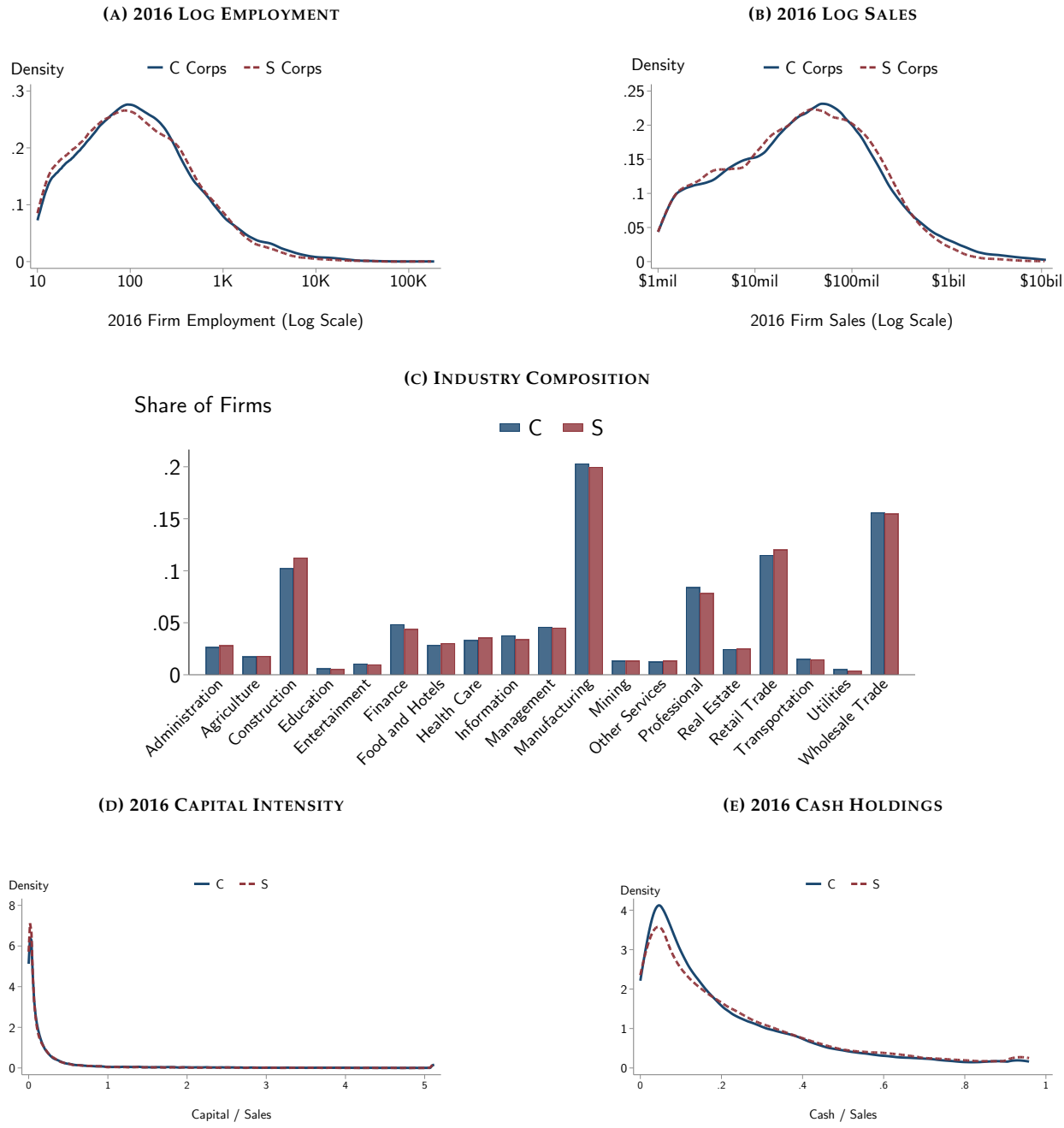
B.4 Additional Summary Statistics

APPENDIX TABLE 3: WEIGHTED 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	0.236	0.163	0.184	0.170	0.150	0.350	0.287	0.138	0.364	0.396
Federal Tax (mil)	0.909	1.584	0.821	1.701	0.023	2.877	0.995	1.455	0.267	3.961
Federal Tax Per Worker	7,125	13,992	4,580	8,592	285	16,042	9,603	17,381	2,598	27,240
Sales and Profits										
Sales (mil)	129.8	445.7	154.1	550.8	30.6	297.1	106.3	309.3	36.6	238.1
Costs (mil)	132.8	475.1	162.2	602.0	34.6	307.2	104.2	301.7	34.8	231.7
Operating Profit (mil)	44.3	197.2	55.2	245.4	10.5	107.6	33.7	133.7	10.6	63.4
After-Tax Op. Profit (mil)	43.4	196.8	54.3	244.9	10.0	105.3	32.7	133.4	9.8	61.3
Taxable Income (mil)	3.1	7.9	1.9	9.3	0.3	11.4	4.3	6.0	1.7	14.5
After-Tax Net Income (mil)	2.2	6.7	1.0	8.0	0.2	8.3	3.3	5.0	1.2	11.5
Shareholder Payouts										
Dividends (mil)	3.2	18.9	1.1	16.0	0.0	0.6	5.4	21.2	1.0	11.0
Share Buybacks (mil)	0.1	4.7	0.1	6.0	0.0	0.0	0.1	2.9	0.0	0.0
Total Payouts (mil)	3.5	20.4	1.3	17.8	0.0	1.0	5.8	22.5	1.0	11.9
Capital and Investment										
Capital (mil)	24.0	278.9	33.8	385.9	3.0	51.8	14.5	91.3	1.8	26.1
Net Investment (mil)	1.3	71.1	2.0	100.1	-0.0	3.6	0.5	11.5	-0.0	2.0
Net Investment / Lagged Capital	0.07	0.34	0.08	0.36	-0.02	0.54	0.06	0.31	-0.02	0.48
Payroll and Employment										
Payroll (1120; mil)	23.9	113.4	28.5	134.2	6.5	56.3	19.4	88.4	5.9	37.3
Payroll (W2; mil)	22.2	99.3	26.3	119.4	6.3	52.3	18.1	74.6	5.7	34.8
Employment	461	2,790	517	3,067	106	884	407	2,489	106	701
Worker Earnings and Characteristics										
Mean Annual Earnings (thous)	62.8	61.5	65.0	58.4	55.1	111.1	60.6	64.2	50.0	91.9
Median Annual Earnings (thous)	45.9	29.2	48.6	32.2	42.9	85.0	43.2	25.7	38.8	67.2
95th Centile Earnings (thous)	170.7	285.7	173.7	266.1	131.6	296.8	167.8	303.5	118.6	260.2
Mean Top 5 Earnings (thous)	374	961	378	919	218	708	371	1,001	197	669
Female Share	0.35	0.23	0.35	0.22	0.32	0.71	0.36	0.23	0.28	0.72
Worker Age	42.2	5.2	42.4	5.1	42.9	48.6	41.9	5.2	41.9	47.7
Firm Characteristics										
Firm Age	28.7	21.1	27.6	21.8	22.3	53.9	29.7	20.3	26.8	56.5
Manufacturing	0.20		0.20				0.20			
Capital Intensive	0.58		0.58				0.57			
N Firms	32,649		17,915				14,734			

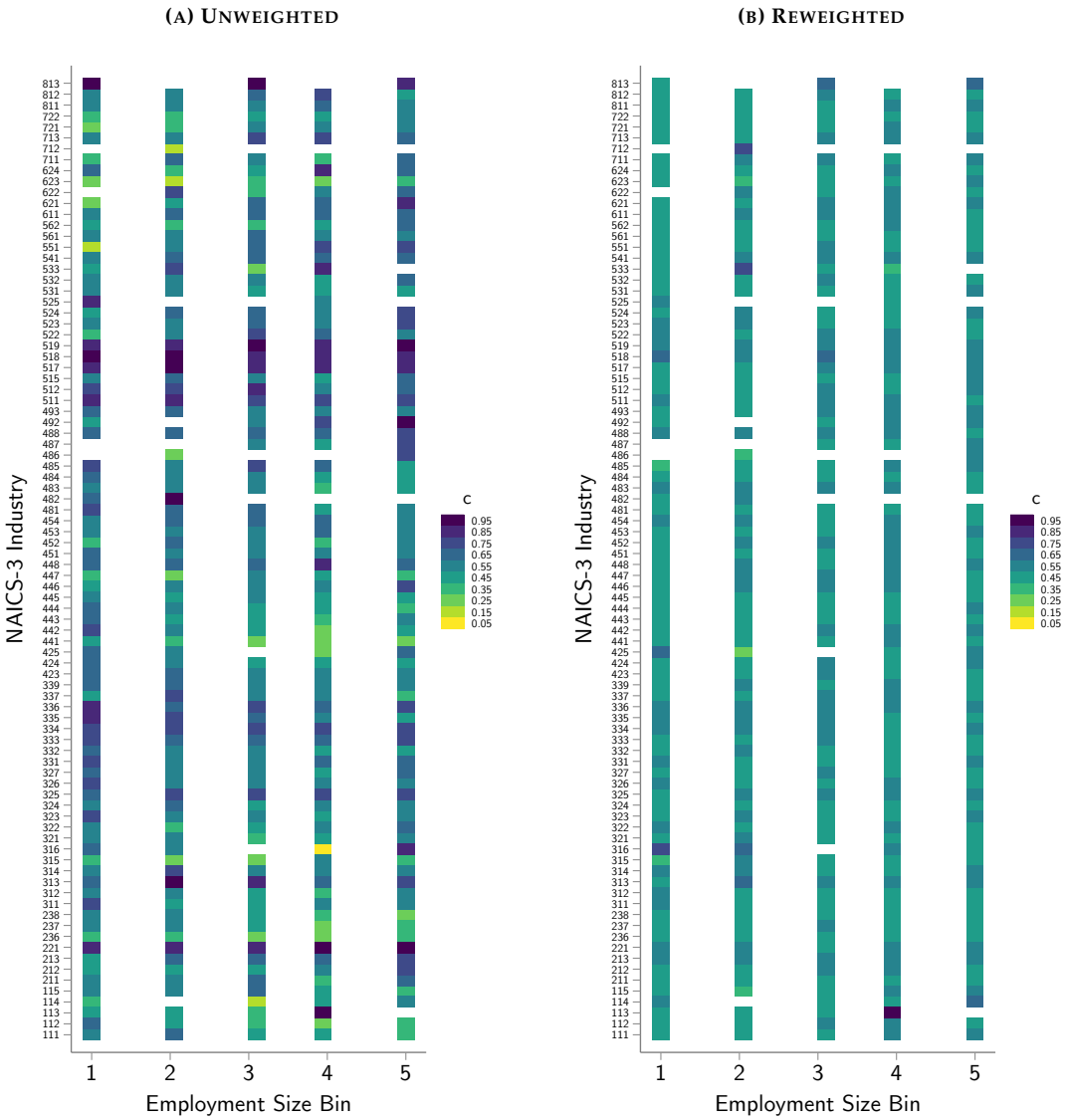
Notes: Table shows summary statistics from 2016 for firms in the analysis sample after reweighting by industry and size. Medians and centile statistics are fuzzed to protect taxpayer privacy. The reweighting procedure ensures that the joint probability distribution of industry-size cells is identical for C and S corps in the estimation sample but does not precisely equalize continuous firm characteristics such as employment or sales within each cell. For data sources and variable definitions see Section 3.

Appendix Figure 7: Weighted Firm Size Distributions and Industry Composition



Notes: The figure shows the distributions of firm characteristics for C and S corps after reweighting the sample to match the industry-size composition of the sample in the pre-period. Panels A and B show the distributions of 2016 log firm employment and log sales, respectively. Panel C shows the NAICS-2 industry composition. Panels D and E show the 2016 distribution of capital intensity (capital / sales) and cash holdings (cash / sales). In Panels D and E the top 1% of outcomes are winsorized to improve the data visualization. The unweighted industry and size distributions are shown in Figure 2.

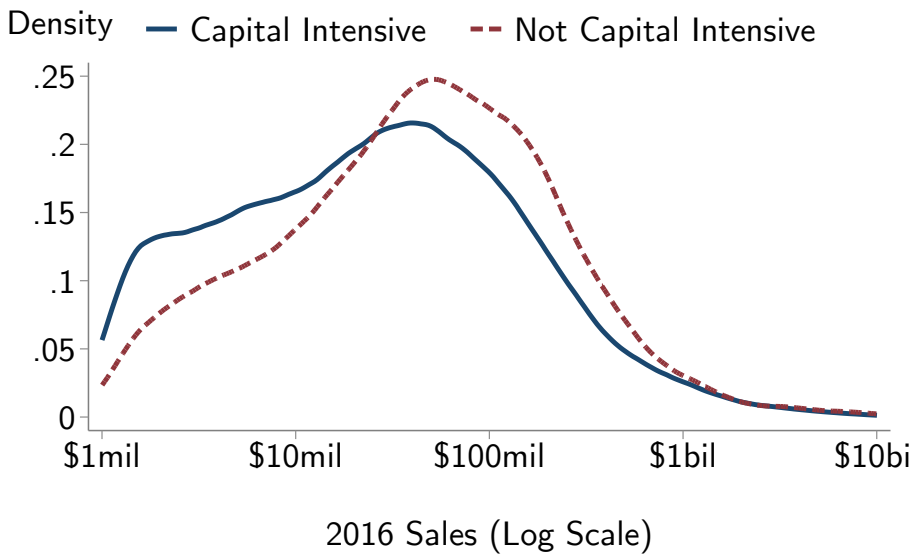
APPENDIX FIGURE 8: JOINT INDUSTRY-SIZE DISTRIBUTION



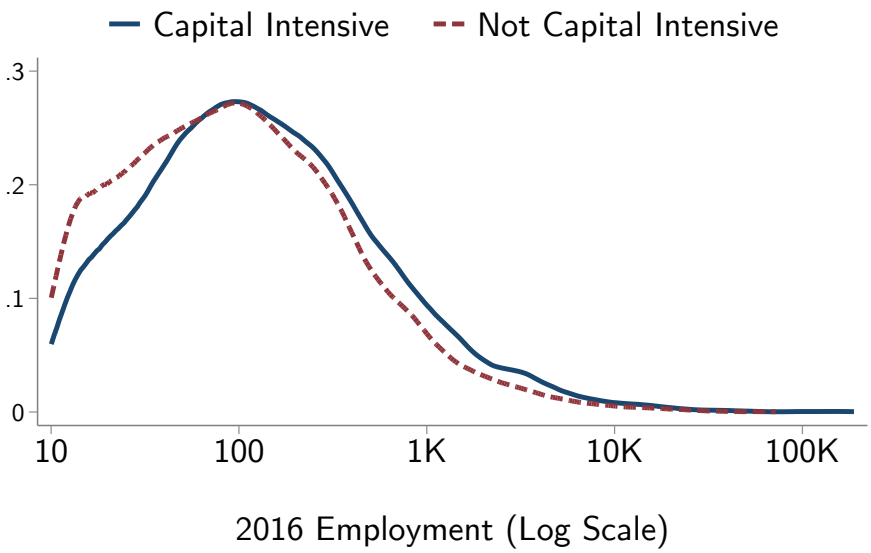
Notes: Panel A shows the unweighted shares of C corporations within each industry-size bin in the pre-period. Panel B shows the shares after reweighting by industry and size using the procedure described in Section II. White cells indicate bins with no observations. Lighter cells indicate lower shares of C corporations and darker shares indicate higher shares.

APPENDIX FIGURE 9: SIZE DISTRIBUTIONS OF FIRMS, BY CAPITAL INTENSITY

Panel A: 2016 Sales

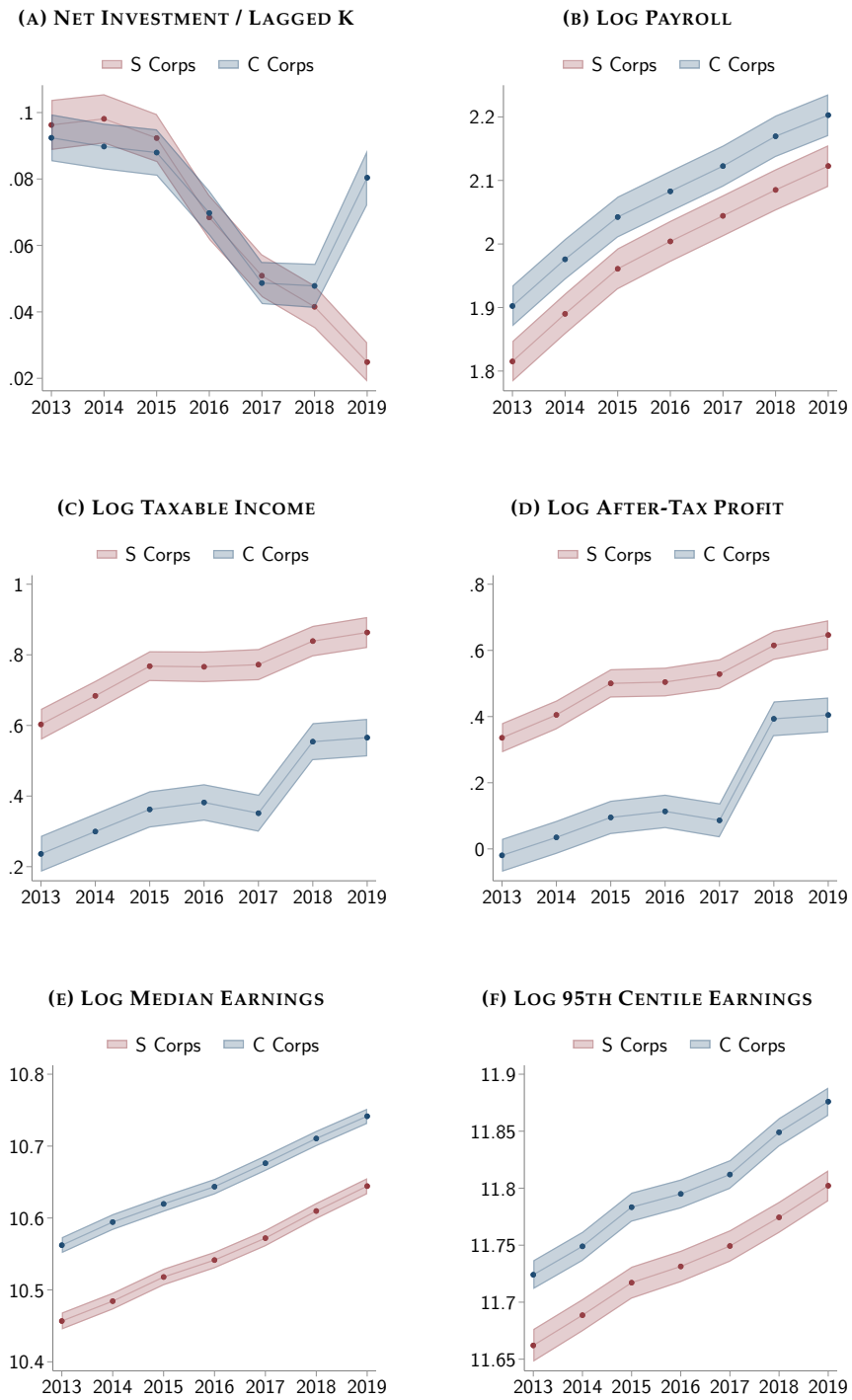


Panel B: 2016 Employment



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

Appendix Figure 10: Raw Outcome Trends



Notes: The panels report raw outcome means for C and S corps in the analysis sample from 2013-2019, using the balanced panel to remove firm composition effects. Error bands show 95% confidence intervals.

C Appendix to Section III: Empirical Results

C.1 Evidence Supporting the Common Elasticity Assumption

The research design comparing C and S corporations relies on two key identifying assumptions. The first is the standard assumption of parallel trends in the absence of the tax reform, and is supported by the broadly flat pre-trends documented in the event studies in Section 4. Since C and S corps are both treated with tax changes in our setting, but with different treatment doses, the research design also requires a second assumption: namely, that C and S corps respond to tax shocks with common elasticities.

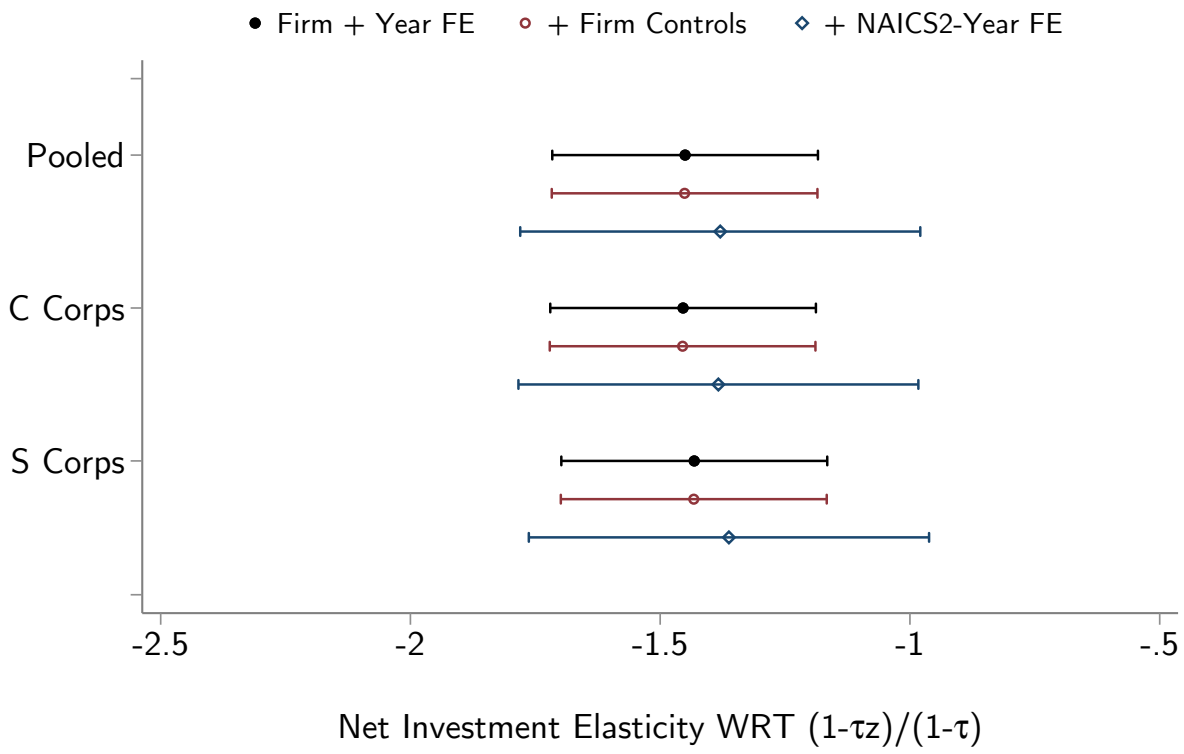
To study whether C and S corps have similar elasticities with respect to tax shocks, we require a source of quasi-experimental variation in effective tax rates *within* the C corp sector and, separately, *within* the S corp sector. The setting in Zwick and Mahon (2017) (henceforth, ZM) is ideal, as their research design exploits cross-industry differences in exposure to changes in accelerated depreciation policies (i.e., bonus depreciation) over time. The original ZM data sample includes both C and S corps, which the authors use to estimate the elasticity of investment with respect to changes in the tax term $\frac{1-\tau z}{1-\tau}$, where τ is the tax rate and z is the present value of a dollar of investment eligible for bonus depreciation. While the original analysis does not report results separately for C vs. S corps, we can apply their cross-industry research design to sub-samples of C and S corps to assess whether the elasticity varies by firm type.

Using the IRS SOI data, we first replicated ZM's pooled results for the most recent period in their sample (2005-2009), using the same sample restrictions and regression specifications used in their original analysis. ZM estimate investment elasticities using the following specification:

$$\frac{I_{ft}}{K_{f,t-1}} = \alpha_f + \beta \frac{1-\tau_{ft} z_{ft}}{1-\tau_{ft}} + \gamma X_{ft} + \varepsilon_{ft}$$

We precisely replicate the investment elasticity of 1.42 (se = 0.13) reported in the third panel of Table 3, column 4 of ZM. These replication results are shown in the "Pooled" coefficients in Figure 11 below. Beyond the baseline specification, we further report specifications with and without the controls used in their original analysis (i.e., time-varying controls for sales, firm age, and assets). In the lower panels, we split the ZM sample by entity type to estimate elasticities separately for C and S corps. The elasticities are economically and statistically indistinguishable for C versus S corps. This evidence is consistent with the common elasticities assumption underlying the research design as described in Section 4.

APPENDIX FIGURE 11: REPLICATION AND EXTENSION OF ZWICK AND MAHON (2017) TO TEST FOR COMMON ELASTICITIES OF C AND S CORPS TO TAX SHOCKS

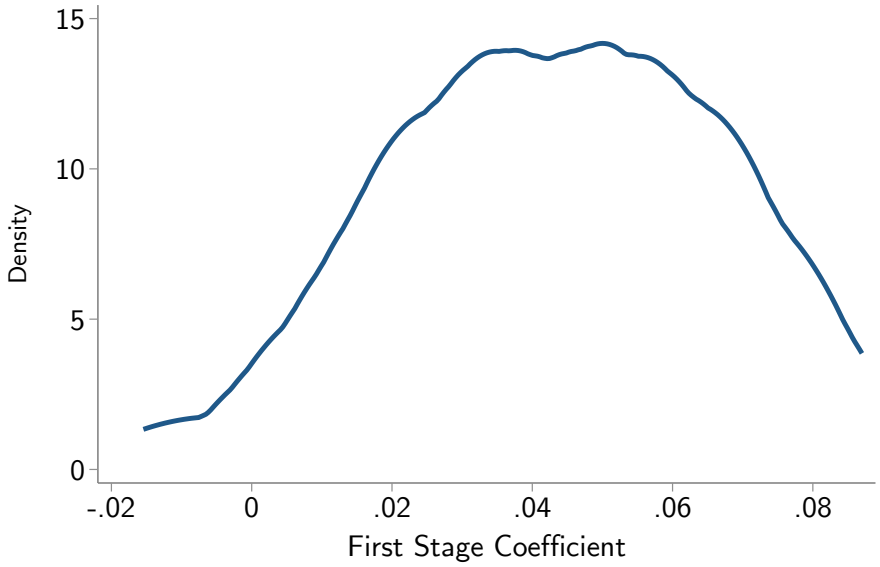


Notes: Unit of analysis is firm-year. The figure plots results from our replication of the investment elasticity from Zwick and Mahon (2017), equation (3), as reported in the third panel of their Table 3, column 4. The outcome is investment scaled by lagged capital and the independent variable is the tax term, $\frac{1-\tau z}{1-\tau}$, where τ is the tax rate and z is the present value of a dollar of investment eligible for bonus depreciation. Specifications are estimated separately for the full pooled sample, for C corporations separately, and for S corporations separately. The specifications designated by the solid black circle, open red circle, and open blue diamond respectively include firm and year fixed effects; add time-varying controls for firms' sales, age, and assets; and add NAICS-2 industry-year fixed effects. Error bars show 95% confidence intervals and standard errors are clustered by firm.

C.2 Evidence Supporting the Monotonicity Assumption

The monotonicity assumption underlying the IV estimation of net-of-tax elasticities requires that no C corp received a smaller tax cut than an S corp due its status as a C corp. Theoretically, this assumption is supported by the institutional fact that the top statutory rate cut was larger by law for C corps than for S corps. Empirically, several additional pieces of evidence support the mononiticty assumption. First, Figure 12 below plots the distribution of β_t coefficients from variations of equation 2, where the outcome is the log net-of-tax change. The coefficients are estimated separately within NAICS-2 industries and within firm size bins, yielding 28 distinct coefficients. The regressions are unweighted and include firm and year fixed effects. 27 of the 28 coefficients are positive, and the single negative coefficient is not statistically distinguishable from zero. Although it is not possible to test for violations of monotonicty at the firm level, this distribution of positive first-stage coefficients across a broad range of subsamples supports the monotonicty assumption. Second, the assumption is further supported by the sub-sample analyses presented in Table 8, which show a uniformly positive first stage in all subsamples. Third, Appendix A.6 showed that switching entity types is extremely rare.

APPENDIX FIGURE 12: DISTRIBUTION OF FIRST-STAGE COEFFICIENTS



Notes: Figure plots the distribution of β_t coefficients from variations of equation 2, where the outcome is the log net-of-tax change. The coefficients are estimated separately within NAICS2 industries and within firm size bins. The regressions are unweighted and include firm and year fixed effects.

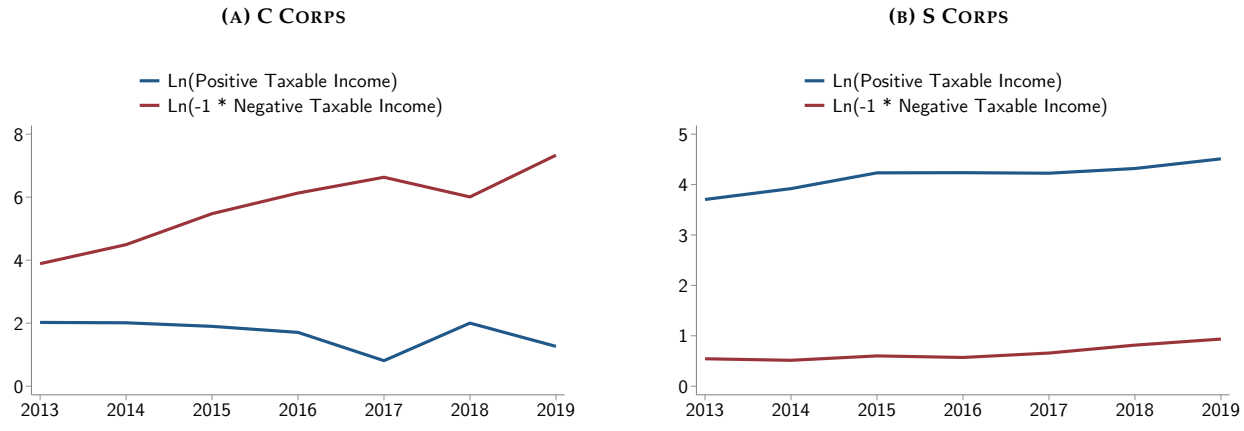
C.3 Intertemporal Profit Shifting

The event studies in Section III show that, in response to corporate tax cuts, C corps increased their capital and labor demand in 2018 and 2019, and also increased their sales, costs, and pre-tax profits. However, whereas investment, labor demand, sales, and costs all increase gradually, pre-tax profits increase sharply and immediately in 2018. This appendix provides evidence that the sharp increase in pre-tax profits in 2018 reflects, in part, efforts by C corporations to intertemporally shift income so as to minimize their tax burdens (see also Dowd et al. (2020) who document intertemporal shifting behaviors by C corporations after TCJA in detail).

In particular, firms faced incentives to accelerate expenses in 2017 (when those expenses could be deducted at a higher rate) and to delay income into 2018 (when that income would be taxed at a lower rate). Such incentives are consistent with the modest dip in taxable income and MTR measures observed in 2017 relative to 2016 in the event studies (reflecting accelerated reporting of expenses) and are also consistent with taxable income increasing sharply and suddenly in 2018 (reflecting delayed income reporting), even as real measures like capital and labor demand increased more gradually. The incentives to intertemporally shift income and losses were larger for C corporations, who faced a significantly larger tax change due to TCJA.

These intertemporal shifting behaviors are small but sufficiently systematic to be discernible in the raw data. Figure 13 below plots raw means of log(taxable income) and log(-1 * negative taxable income) in the analysis sample for both C and S corps. Among C corps, the two series diverge inversely in 2017 and 2018 in a mirror-image manner. The results are more muted for S corps, consistent with their weaker incentives to shift income given their smaller tax change. These results help to explain the timing patterns observed in the event studies. To assess sensitivity to this shifting, Table 8 in Section 4.4 of the paper reports elasticity estimates from specifications that exclude 2017 and 2018 from the sample.

APPENDIX FIGURE 13: RAW DATA TRENDS IN TAXABLE INCOME FOR C AND S CORPS



Notes: The unit of analysis is a firm-year. The panels show raw trends of log(taxable income) and log(-1 * taxable income) for C and S corporations, respectively. The figure is strongly suggestive of intertemporal shifting of profits among C corps in 2017 and 2018.

C.4 Extensive Margin Responses

In this section we present additional analyses to study how tax cuts may affect both intensive and extensive margin firm outcomes. To do so, we use methods developed in the literature to study outcomes with zeros (following Chen and Roth 2024) and to study negative capital income (following Kleven and Schultz 2014).

Chen and Roth (2024) propose guidance for studying outcomes with zeros as follows. When the researcher aims to estimate a single, scale-invariant percentage-of-the-mean effect and is willing to treat intensive and extensive responses symmetrically, they recommend Poisson quasi-maximum likelihood (PPML). Estimation via PPML does not exclude observations where the outcome is zero, and PPML coefficients are scale invariant and can be interpreted as percent changes with log regressors. However, when zeros reflect distinct economic decisions that may be of interest to the researcher (for example, in our setting, such as the decision to initiate dividend payments), Chen and Roth advise estimating the conditional change in the amount paid (the intensive margin) in one model and, separately, the probability of paying anything at all (the extensive margin).

Kleven and Schultz (2014) estimate taxable income elasticities for individuals in Denmark following significant tax reforms. For our purposes, their key innovation is to model effects on positive and negative capital income separately, taking into account that the two forms of income may face asymmetric tax rates.

Below we describe how we have applied the logic from these papers in our setting, and present additional analyses to illuminate additional dimensions of intensive and extensive margin responses.

Federal Taxes Paid

Federal corporate tax liability is a function of positive taxable income and zero otherwise. Empirically, taxable income is more likely to be positive than negative, but is quite smooth above and below zero, suggesting that firms have limited capacity to "choose" positive or negative profits. With respect to taxes paid, our aim is to illuminate the overall fiscal response, rather than to document intensive versus extensive margin responses. In this case, the guidance from Chen and Roth (2024) implies that the scale-invariant percentage-of-the-mean parameter is appropriate. Thus, in the event studies in Figure 3, we report PPML regressions where taxes paid and tax per worker are the outcomes.

For completeness, Appendix Table 4 below also reports intensive and extensive margin elasticities separately. Column 1 reports that the intensive margin elasticity is negative and statistically significant, as expected. The extensive margin is also negative and statistically signficiant, although the total effect is small: a 5-10% increase in the net-of-tax rate decreases the probability of paying positive tax by approximately 4-8 percentage points. A larger tax cut increases the chance that fixed tax credits, deductions, or carryforwards are sufficient to fully offset tax liability, especially for firms near the bottom of the taxable income distribution. This makes it more likely

that firms with large rate reductions pay zero tax, even if their pre-tax profits may rise. As a result, firms receiving larger tax cuts may be modestly less likely to report positive tax payments, due to nonlinearities and thresholds in the tax code.

Dividends and Share Buybacks

Dividend payouts and share buybacks, by contrast, reflect discrete choices. Firms first choose whether to pay dividends to shareholders (Lintner 1956; Brav et al. 2005), and then choose the payout amount. Because economic theory assigns different determinants to the two margins, the guidance from Chen and Roth (2024) implies that it is appropriate to model the two outcomes separately.

We report dividend and buyback estimates for both margins below in Table 5. Column 3 indicates a large intensive margin effect on dividend payouts, and columns 4 and 6 imply economically and statistically significant increases in the extensive margin probabilites that firms initiate dividend payouts or share buybacks, respectively. Column 5 reports a positive but statistically insignificant intensive margin effect on share buybacks.

APPENDIX TABLE 4: TAXES, DIVIDENDS, AND SHARE BUYBACKS

	(1) ln(Tax)	(2) **1**(Tax>0)	(3) ln(Dividends)	(4) **1**(Div>0)	(5) ln(Buybacks)	(6) **1**(Buy>0)
$\ln(1-\tau_{f,t})$	-0.456	-0.824	1.468	0.242	1.545	0.402
	(0.177)	(0.068)	(0.198)	(0.062)	(1.344)	(0.063)
2016 Outcome Mean	0.92	0.67	2.91	0.46	0.12	0.13
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	144,453	231,360	101,544	231,360	6,250	231,360
N Firms	34,053	49,235	22,921	49,235	1,804	49,235

Notes: The unit of analysis is a firm-year. The table reports results from equation 4. Standard errors are clustered by firm. The 2016 outcome means are reported before taking logs and are scaled in nominal dollars in columns 1, 3, and 5. All specifications include firm and industry-size fixed effects, and the data are reweighted to match the joint industry-size distribution of firms in the pre-period. Specifications where the outcome is binary and the endogenous variable is logged correspond to semi-log linear probability models; in this case, the interpretation of the estimated coefficient is that a 1% increase in the log net-of-tax rate is associated with a $0.01 \times \varepsilon$ increase in the probability that the outcome = 1. Thus, even the statistically significant coefficients reflect effects that are economically small.

Profits

Taxable income and other profit measures may be positive, negative, or zero. Section III estimates intensive margin responses (i.e., treatment effects conditional on positive profits). This section investigates extensive margin responses and impacts on negative profits. To assess extensive margin responses, we estimate linear probability models. To estimate effects on negative capital income, we adopt the approach of Kleven and Schultz (2014), who estimate the following elasticities:

$$\varepsilon^{-} = \frac{\partial \ln(-\pi_{ft})}{\partial(1-\tau_{ft})}, \text{ for } \pi_{ft} < 0$$

Following Kleven and Shultz, we use the statutory marginal tax rate as the relevant marginal subsidy. This tax rate provides a transparent, theory-consistent benchmark, and isolates how sensitive reported losses are to the headline tax incentive per dollar of loss. Since Appendix C.3 documents that firms intertemporally shifted income surrounding TCJA's tax changes, the table also reports results both including and excluding 2017/2018 from the sample.

Panel A of Table 5 presents elasticities of taxable income with respect to the net-of-tax rate, separately examining intensive and extensive margin responses. Columns 1 through 3 use the full sample, while columns 4 through 6 exclude the 2017 and 2018 tax years to address potential distortions from intertemporal shifting around the implementation of TCJA. In each panel, column 1 estimates elasticities for firms with positive taxable income; column 2 estimates elasticities for the absolute value of losses among firms with negative income; and column 3 estimates effects on the extensive margin (i.e., the likelihood that a firm reports positive income).

In both sample periods, firms with positive taxable income increase their reported profits in response to lower tax rates, as reflected in positive and statistically significant elasticities in columns 1 and 4. Column 2 suggests an increase in reported losses, but the effect is not statistically significant in column 5 after removing sample years most likely to have been affected by intertemporal shifting. Extensive margin responses are more modest: the probability of reporting positive taxable income appears null in the full sample (column 3), and is negative and statistically significant though economically small when 2017 and 2018 are excluded (column 6). Panel B reports broadly similar results for after-tax profits.

APPENDIX TABLE 5:
TAXABLE INCOME AND AFTER-TAX PROFIT

(A) TAXABLE INCOME

	All Years			Excl. 2017/18		
	(1) $ln(\pi)$	(2) $ln(-\pi)$	(3) $\mathbf{1}(\pi > 0)$	(4) $ln(\pi)$	(5) $ln(-\pi)$	(6) $\mathbf{1}(\pi > 0)$
$\ln(1-\tau_{f,t})$	0.697		0.011	0.705		-0.349
	(0.158)		(0.075)	(0.246)		(0.102)
$\ln(1+\tau^{-}_{f,t})$		1.364			0.295	
		(0.457)			(0.688)	
2016 Outcome Mean	2.85	4.64	0.75	2.85	4.64	0.75
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	167,773	48,236	231,360	114,988	28,681	157,725
N Firms	39,032	15,635	49,235	33,018	10,618	41,774

(B) AFTER-TAX PROFIT

	All Years			Excl. 2017/18		
	(1) $ln(\pi)$	(2) $ln(-\pi)$	(3) $\mathbf{1}(\pi > 0)$	(4) $ln(\pi)$	(5) $ln(-\pi)$	(6) $\mathbf{1}(\pi > 0)$
$\ln(1-\tau_{f,t})$	1.064		-0.061	1.025		-0.436
	(0.156)		(0.075)	(0.242)		(0.103)
$\ln(1+\tau^{-}_{f,t})$		1.153			0.189	
		(0.473)			(0.725)	
2016 Outcome Mean	1.93	4.51	0.74	1.93	4.51	0.74
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Size-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	166,197	49,698	231,360	113,865	29,618	157,725
N Firms	38,833	16,056	49,235	32,814	10,935	41,774

Notes: The unit of analysis is a firm-year. The table reports results from equation 4. Standard errors are clustered by firm. The 2016 outcome means are reported before taking logs and are scaled in nominal dollars in columns 1, 3, and 5. All specifications include firm and industry-size fixed effects, and the data are reweighted to match the joint industry-size distribution of firms in the pre-period. Specifications where the outcome is binary and the endogenous variable is logged correspond to semi-log linear probability models: the interpretation of the estimated coefficient is that a 1% increase in the log net-of-tax rate is associated with a $0.01 \times \varepsilon$ increase in the probability that the outcome = 1.

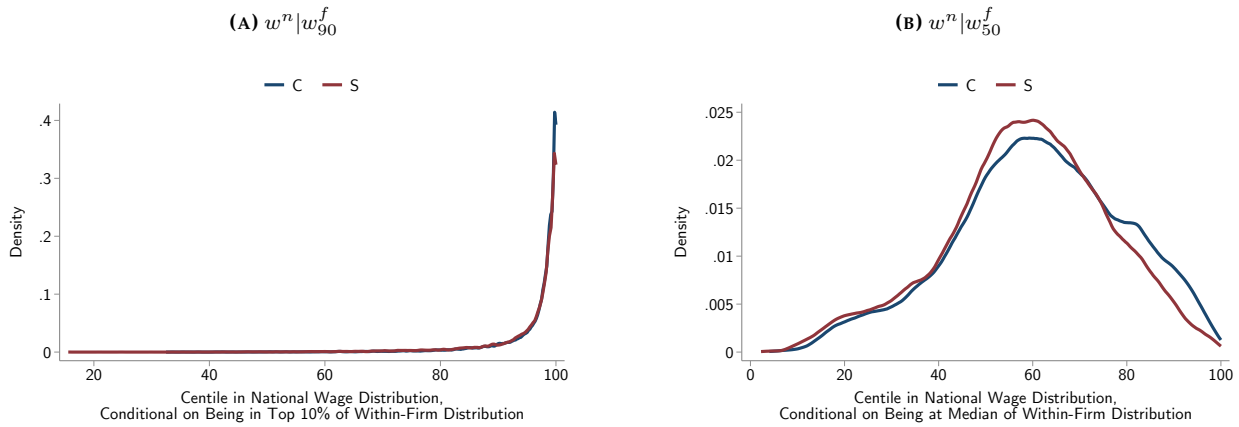
C.5 Comparing the Within-Firm and National Wage Distributions

The incidence analysis in Section IV extrapolates treatment effects based on comparisons across the the within-firm earnings distribution to estimate distributional effects across the national earnings distribution. This appendix provides empirical evidence that this is a reasonable approximation.

First, we document that it is empirically rare that workers in the top 10% of the within-firm distribution are not also in the top 10% of the national distribution. Workers at the median of the within-firm distribution are somewhat more dispersed throughout the national wage distribution, however. These patterns are illustrated below, where w_p^n denotes rank p in the national distribution and w_p^f denotes rank p in the within-firm distribution.

Panel (a) shows that workers at the top of the within-firm are nearly always at the top of the national distribution. Panel (b) shows more dispersion, and also shows that the median earner in the corporate sector is modestly positively selected on wages relative to the median worker in the national distribution.

APPENDIX FIGURE 14: FIRM-SPECIFIC VS. NATIONAL WAGE DISTRIBUTIONS



Notes: The unit of analysis is worker-year. Panel A plots the centile of workers in the national wage distribution, conditional on being in the top 10% of the within-firm distribution, for C and S corps in the analysis sample in the pre-period. Panel B plots the centile of a worker in the national wage distribution, conditional on being at the median of the the within-firm distribution, for C and S corps in the analysis sample in the pre-period.

To disentangle the role of within-firm vs. national distributions in the results, we split the sample to estimate relative wage growth (C vs S) of workers in firms whose median workers are intially (in the pre-period) at the median of the within-firm distribution (w_{50}^f) but in the top 10% of the national wage distribution (w_{90+}^n). We also estimate relative wage growth of workers at firms initially at the 90th percentile the within-firm distribution (w_{90}^f) but not in the top 10% of the national distribution (w_{90-}^n). These tests provide bounds on the interaction effects of within-firm and national wage distributions if one is willing to assume, consistent with Figure 7, that treatment effects on earnings are likely to be weakly monotonically increasing with respect to workers' place in either distribution.

The table below reports the results. Columns 1 and 4 show the results without conditioning on initial place in the national wage distribution; columns 2 and 5 condition on initially being in the top 10% of the national distribution; and columns 3 and 6 condition on initially being below the 90th percentile of the national distribution.

APPENDIX TABLE 6: EARNINGS EFFECTS CONDITIONING ON PLACE IN THE NATIONAL EARNINGS DISTRIBUTION

	(1) w^f_{50}	(2) $w^f_{50}\|w^n_{90+}$	(3) $w^f_{50}\|w^n_{90-}$	(4) w^f_{90}	(5) $w^f_{90}\|w^n_{90+}$	(6) $w^f_{90}\|w^n_{90-}$
$C_f \times Post_t$	-0.002	-0.005	-0.002	0.007**	0.009***	0.003
	(0.002)	(0.016)	(0.002)	(0.003)	(0.003)	(0.008)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Size FE	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.94	0.85	0.92	0.93	0.92	0.85
N	231,360	8,229	222,710	231,360	202,333	28,598

Notes: The unit of analysis is a firm-year. The table reports the $C \times Post$ coefficients from equation 2. The coefficients estimate average differential changes in log earnings between C and S corps before and after TCJA, controlling for firm and industry-size-year fixed effects. Column 1 reports baseline estimates for log annual earnings of workers initially at the median of the within-firm distribution in 2016. Columns 2 and 3 report estimates for log annual earnings of workers initially at the median of the within-firm distribution in 2016 and in the top 10% of the national wage distribution, and not in the top 10% of the national wage distribution, respectively. Column 4 reports baseline estimates for log annual earnings of workers initially at the 90th centile of the within-firm distribution in 2016. Columns 5 and 6 report estimates for log annual earnings of workers initially at the 90th centile of the within-firm distribution in 2016 and in the top 10% of the national wage distribution, and not in the top 10% of the national wage distribution, respectively. Standard errors are clustered by firm.

Columns 1-3 show that workers at the median of the within-firm distribution do not see increases in wages irrespective of their place in the national distribution. Columns 4-6 show that workers at the top of the within-firm distribution benefit only if they are also at the top of the national distribution. However, it is rare for workers to be "off the diagonal" of this matrix, as shown by the low observation counts in columns 2 and 6.

The results imply that extrapolating from the within-firm distribution to the national distribution yields a reasonable approximation. To the extent this analysis adds nuance to the main findings, it is that the main results may slightly understate the effects of the tax cuts on increasing wage dispersion nationally (since extrapolating the estimates at the top of the within-firm distribution to the broader population is modestly over-inclusive of a small share of top-firm workers not in the top 10% nationally.) However, given the rarity of such workers, this bias would be small.

C.6 Robustness to Alternate Specifications

Appendix Table 7 reports robustness results for the key elasticities, focusing on investment, payrolls, profits, and workers' earnings. We focus on these outcomes due to their usefulness in interpreting mechanisms and their central role in the incidence quantification in Section 4.

Row 1 reports the net-of-tax elasticities from equation 1 using the benchmark regression specification. The remaining rows assess the sensitivity of these estimates to alternate modeling choices. All specifications include firm and industry-size-year fixed effects and reweight the sample to match the pre-TCJA industry-size distribution of firms, unless noted otherwise.

Row 2 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 3 defines industries using 6-digit, rather than 3-digit, NAICS codes. Row 4 controls for firm age with cohort-by-year fixed effects, where cohorts are defined as terciles of incorporation year. Row 5 includes controls for log mean firm employment in the pre-period, interacted with year indicators. Row 6 controls for quintiles of shareholder counts-by-year fixed effects, noting that the number of shareholders is measured imperfectly especially for C corps. Row 7 controls for pre-trends, interacting the 2013-2016 firm-specific trend in the outcome with year indicators. Row 8 controls only for firm and year fixed effects. Row 9 reports unweighted results. Row 10 winsorizes the outcomes at the 5th and 95th percentiles, and row 11 at the 1st and 99th percentiles. Row 12 weights observations by each firm's 2016 sales (and for labor market outcomes, by 2016 employment).

APPENDIX TABLE 7: ROBUSTNESS TO ALTERNATE SPECIFICATIONS

Specification	(1) $\ln(1-\tau_{ft})$	(2) ε^{I} I_t/K_{t-1}	(3) ε^{wL} Payroll	(4) ε^{π} Tax. Inc.	(5) $\varepsilon^{\pi(1-\tau)}$ After-Tax π	(6) $\varepsilon^{w_{p50}}$ p50 w	(7) $\varepsilon^{w_{p95}}$ p95 w	(8) $\varepsilon^{w_{exec}}$ Exec w
1. Benchmark	0.055	0.449	0.369	0.697	1.064	-0.027	0.224	0.466
	(0.002)	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.057)	(0.079)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
2. Location Controls	0.056	0.449	0.328	0.632	0.999	-0.042	0.223	0.458
	(0.002)	(0.070)	(0.085)	(0.159)	(0.157)	(0.040)	(0.057)	(0.078)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
3. Industry = NAICS-6	0.056	0.465	0.309	0.700	1.046	0.007	0.241	0.474
	(0.002)	(0.072)	(0.086)	(0.165)	(0.163)	(0.039)	(0.057)	(0.079)
	231,360	204,055	231,360	166,789	165,193	231,360	231,360	231,360
4. Age Controls	0.056	0.461	0.262	0.695	1.064	-0.045	0.196	0.412
	(0.002)	(0.070)	(0.084)	(0.158)	(0.156)	(0.039)	(0.055)	(0.076)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
5. Finer Size Controls	0.055	0.456	0.342	0.696	1.063	-0.030	0.224	0.453
	(0.002)	(0.071)	(0.085)	(0.158)	(0.156)	(0.040)	(0.057)	(0.078)
	225,444	203,219	225,444	164,613	163,069	225,444	225,444	225,444
6. Shareholder Controls	0.058	0.388	0.322	0.568	0.957	-0.062	0.171	0.406
	(0.002)	(0.071)	(0.087)	(0.168)	(0.166)	(0.041)	(0.058)	(0.080)
	213,177	188,241	213,177	154,568	153,080	213,177	213,177	213,177
7. Pre-Trend Controls	0.055	0.447	0.374	0.707	1.080	-0.029	0.224	0.447
	(0.002)	(0.070)	(0.082)	(0.157)	(0.155)	(0.039)	(0.055)	(0.077)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
8. Firm + Year FE Only	0.056	0.459	0.359	0.696	1.069	-0.039	0.227	0.455
	(0.002)	(0.071)	(0.087)	(0.158)	(0.156)	(0.040)	(0.057)	(0.079)
	231,360	204,432	231,360	167,838	166,265	231,360	231,360	231,360
9. Unweighted	0.053	0.427	0.453	0.765	1.122	-0.023	0.224	0.511
	(0.001)	(0.073)	(0.087)	(0.157)	(0.155)	(0.041)	(0.058)	(0.080)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
10. Winsorize 5-95	0.055	0.449	0.510	0.697	1.064	-0.001	0.242	0.585
	(0.002)	(0.070)	(0.080)	(0.158)	(0.156)	(0.034)	(0.045)	(0.068)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
11. Winsorize 1-99	0.055	0.647	0.394	0.615	0.943	-0.018	0.198	0.490
	(0.002)	(0.160)	(0.085)	(0.161)	(0.158)	(0.038)	(0.052)	(0.075)
	231,360	204,411	231,360	167,773	166,138	231,360	231,360	231,360
12. Firm Size Weights	0.076	0.381	0.327	0.752	1.308	0.067	0.242	0.331
	(0.003)	(0.082)	(0.112)	(0.172)	(0.172)	(0.050)	(0.056)	(0.137)
	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360

Notes: The table reports the first stage from equation 3 (column 1) and the net-of-tax elasticities from equation 4 (columns 2-8). The outcomes are: the net-of-tax rate, taxable income, after-tax profits, net investment, payroll, median worker earnings, 95th centile worker earnings, and executive earnings. All outcomes except net investment are logged. All specifications include firm and industry-size-year fixed effects and are reweighted to match the joint industry-size distribution of firms in the pre-period, unless otherwise noted. Row 1 shows the benchmark specification. Row 2 controls for state-by-year fixed effects, using the firm's reported address from the 1120. Row 3 defines the industries as 6-digit (rather than 3-digit) NAICS codes. Row 4 includes cohort-by-year effects, where cohorts are defined as terciles of incorporation year. Row 5 includes controls for log mean firm employment in the pre-period, interacted with year indicators. Row 6 controls for quintiles of shareholder counts-by-year fixed effects, noting that the number of shareholders is measured imperfectly especially for C corps. Row 7 controls for pre-trends, interacting 2013-2016 changes in the outcome with year indicators. Row 8 includes only firm and year fixed effects. Row 9 reports unweighted regressions. Rows 10 and 11 apply alternate winsorizing thresholds. Row 12 weights the regressions by mean firm sales, or by mean firm employment for labor market outcomes; these weights are winsorized at the 5th/95th percentiles to improve precision. Standard errors are clustered by firm.

C.7 Robustness to Alternate Samples and Controlling for Other TCJA Provisions

Appendix Table 8 assesses the sensitivity of the results to alternate samples. Row 1 shows the benchmark specification. Row 2 excludes unbalanced industry-size cells, defined as those in which C corps account for greater than 80% or less than 20% of firms in the unweighted sample. Row 3 excludes manufacturing firms, which may have been affected, for example, by changes in tax deductions for domestic production or by the 2018-2019 U.S.-China trade war. Row 4 uses the balanced panel. Row 5 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 6 excludes S corps with only one owner, who have the strongest incentives to reclassify wages and profits. The results indicate that these adjustment margins do not drive the results.

The benchmark elasticities reported in the paper are estimated from data samples that exclude public and multinational firms, where multinationals are defined as firms that earn more than 5% of their revenues abroad. A reason to exclude public and multinational firms is to improve the covariate balance of C and S corps, since S corps cannot be public firms and C corps are modestly more likely to be multinational firms. However, there is also reason to include them in the analysis: if, for example, tax cuts cause C corps to expand, and expanding firms are more likely to become public firms or increase their foreign sales, then excluding them would bias the elsaticitiy estimates downward. Empirically, we find that C corps are approximately 0.006 percentage points ($\approx 9\%$) more likely to become public in 2018 and 2019 relative to C corps in the pre-period, controlling for firm and industry-size fixed effects. (Note that this analysis leverages a single difference and cannot account for time fixed effects, since S corps are not a valid control in this case.) However, we do not find any change in firms' foreign sales share after TCJA. Table 8 reports the net-of-tax elasticities from samples that include public and multinational firms. Row 7 includes public firms, and row 8 adds multinationals. The elasticities are broadly within the confidence intervals of the benchmark results.

Rows 9 to 12 report additional tests to control for exposure to concurrent TCJA policies. Row 9 excludes industries most likely to claim DPAD deductions. Row 10 controls for third-order polynomials in NOL deductions scaled by sales at the industry-size level in the pre-period and interacted with year dummies. Rows 11 and 12 do the same for net interest deductions scaled by sales and for exposure to bonus depreciation as in Zwick and Mahon (2017), both measured at the firm level in the pre-period.

APPENDIX TABLE 8: ROBUSTNESS TO ALTERNATE SAMPLES AND TO CONTROLS FOR CONCURRENT POLICIES

Specification	(1) $\ln(1-\tau_{ft})$	(2) ε^{I} I_t/K_{t-1}	(3) ε^{wL} Payroll	(4) ε^{π} Tax. Inc.	(5) $\varepsilon^{\pi(1-\tau)}$ After-Tax π	(6) $\varepsilon^{w_{p50}}$ p50 w	(7) $\varepsilon^{w_{p95}}$ p95 w	(8) $\varepsilon^{w_{exec}}$ Exec w
1. All Firms	0.055	0.449	0.369	0.697	1.064	-0.027	0.224	0.466
s.e.	(0.002)	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.057)	(0.079)
N	231,360	204,411	231,360	167,773	166,197	231,360	231,360	231,360
2. Exclude Mismatch Ind-Size Bins	0.057	0.428	0.288	0.658	1.028	-0.043	0.203	0.423
s.e.	(0.002)	(0.070)	(0.084)	(0.159)	(0.157)	(0.039)	(0.056)	(0.077)
N	222,118	196,411	222,118	162,436	160,901	222,118	222,118	222,118
3. Exclude Mfg Industries	0.054	0.487	0.381	0.706	1.078	-0.021	0.270	0.557
s.e.	(0.002)	(0.084)	(0.102)	(0.184)	(0.182)	(0.047)	(0.068)	(0.092)
N	184,024	161,909	184,024	133,519	132,133	184,024	184,024	184,024
4. Balanced Panel	0.057	0.360	0.348	0.647	0.992	-0.035	0.224	0.669
s.e.	(0.002)	(0.070)	(0.150)	(0.196)	(0.195)	(0.063)	(0.081)	(0.114)
N	139,076	134,227	138,443	108,746	107,758	138,409	138,409	138,419
5. Exclude 2017-2018	0.053	0.915	0.271	0.705	1.025	-0.061	0.217	0.539
s.e.	(0.002)	(0.111)	(0.120)	(0.246)	(0.242)	(0.055)	(0.080)	(0.113)
N	157,725	140,344	157,725	114,988	113,865	157,725	157,725	157,725
6. Exclude Single-Owner S-Corps	0.060	0.398	0.421	0.776	1.109	0.011	0.244	0.523
s.e.	(0.002)	(0.071)	(0.089)	(0.163)	(0.162)	(0.039)	(0.057)	(0.083)
N	197,372	175,455	197,372	139,964	138,701	197,372	197,372	197,372
7. + Public Firms	0.055	0.439	0.546	0.749	1.127	-0.018	0.257	0.616
s.e.	(0.002)	(0.069)	(0.089)	(0.153)	(0.151)	(0.040)	(0.059)	(0.083)
N	242,473	215,051	242,473	174,970	173,381	242,473	242,473	242,473
8. + Multinational Firms	0.055	0.415	0.643	0.828	1.236	-0.018	0.225	0.637
s.e.	(0.001)	(0.065)	(0.088)	(0.139)	(0.138)	(0.038)	(0.056)	(0.083)
N	274,985	244,968	274,985	195,795	194,094	274,985	274,985	274,985
9. Exclude DPAD Industries	0.051	0.432	0.190	0.755	1.190	0.055	0.236	0.332
s.e.	(0.003)	(0.125)	(0.161)	(0.289)	(0.287)	(0.074)	(0.102)	(0.138)
N	83,050	74,752	83,050	61,230	60,445	83,050	83,050	83,050
10. NOL Exposure Controls	0.055	0.449	0.369	0.697	1.064	-0.027	0.224	0.466
s.e.	(0.002)	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.057)	(0.079)
N	231,354	204,411	231,354	167,767	166,191	231,354	231,354	231,354
11. 163(j) Exposure Controls	0.055	0.465	0.368	0.746	1.089	-0.026	0.220	0.475
s.e.	(0.002)	(0.073)	(0.087)	(0.164)	(0.161)	(0.040)	(0.057)	(0.080)
N	231,354	204,411	231,354	167,767	166,191	231,354	231,354	231,354
12. Bonus Exposure Controls	0.056	0.472	0.371	0.679	1.043	-0.027	0.223	0.463
s.e.	(0.002)	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.057)	(0.079)
N	231,354	204,411	231,354	167,767	166,191	231,354	231,354	231,354

Notes: The table reports the first-stage estimates and net-of-tax elasticities for key outcomes estimated from equation 3 (column 1) and equation 4 (columns 2-8) using alternate samples and including controls for concurrent policy changes. The outcomes are: the net-of-tax rate, taxable income, after-tax profits, net investment, payrolls, median worker earnings, 95th centile worker earnings, and executive earnings. All outcomes except net investment are logged. All specifications include firm and industry-size-year fixed effects and are reweighted to match the joint industry-size distribution of firms in the pre-period. Row 1 shows the benchmark specification with all firms. Row 2 excludes industry-size bins where the unweighted firm share of C corps is less than 20% or greater than 80%. Row 3 excludes manufacturing industries. Row 4 uses the balanced panel. Row 5 excludes years 2017 and 2018. Row 6 excludes single-owner S corps. Row 7 excludes the industries that account for >90% of DPAD deductions in the pre-period. Row 8 controls for NOL exposure, defined as cubic polynomials in the average observed ratio of NOL deductions to sales at the industry-size level in the pre-period interacted with year dummies. Row 9 similarly controls for 163(j) exposure, using the ratio of net intrest to sales at the firm level in the pre-period. Row 10 similarly controls for bonus exposure, where bonus exposure is defined at the firm level as in Zwick and Mahon (2017). See Appendix B for additional details.

C.8 Accounting for Expectations and Adjustment Costs

TCJA permanently lowered the corporate income tax rate from 35% to 21%, but the provisions affecting the individual tax code (and therefore affecting S corps) were formally temporary. For example, the the top personal income tax rate cut was scheduled to expire in 2026 and then rebound to 39.6%, and the QBI provisions were scheduled to similarly sunset. This Appendix evaluates how S corps' sensitivity to the temporary provisions of TCJA may affect the main results using methods developed in the literature.

Auerbach and Hassett (1992) study the effects of taxes on investment when firms are forward-looking and tax policy changes over time. The authors 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:

$$\phi_t = \sum_{s \geq t} w_{s-t} \phi_s \tag{16}$$

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. Cohen, Hansen, and Hassett (2002) formulate the weights in Equation 16 using the parameter Ω:

$$w_0 = 1 - \Omega \tag{17}$$

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

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. We assess sensitivity to TCJA's temporary provisions affecting S corps by varying the Ω parameter and assuming that, after those provisions were set to expire in 2026, the marginal tax rate facing an S corp reverts back to its value in 2017.

The first row of Appendix Table 9 reports the benchmark net-of-tax elasticities using the marginal income tax rates reported in the main text; these specifications implicitly put a weight of 1 on the current period and weights of zero on all successive periods. Rows 2-4 vary the adjustment cost parameter, thus allowing firms to be forward-looking. Cohen, Hansen, and Hassett (2002) use a range of Ω from 0.3 to 0.7, arguing these correspond to plausible low and high ranges. We extend this range to also include a very high parameter value of 0.9 (i.e., a very high weight on future tax rates). For any value of Ω, the elasticities are very close to the benchmark case. The reason is that, using this conventional model, the temporary provisions of TCJA were scheduled to sunset too distantly in the future to meaningfully affect investment decisions in 2018 and 2019.

APPENDIX TABLE 9: FORWARD-LOOKING ELASTICITIES WITH ADJUSTMENT COSTS

	(1) ε^I	(2) ε^L	(3) ε^π	(4) $\varepsilon^{\pi(1-\tau)}$	(5) $\varepsilon^{w_{p50}}$	(6) $\varepsilon^{w_{p95}}$	(7) $\varepsilon^{w_{exec}}$
Benchmark	0.449	0.369	0.697	1.064	-0.027	0.224	0.466
	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.057)	(0.079)
$\Omega = 0.3$	0.449	0.369	0.697	1.064	-0.027	0.224	0.466
	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.057)	(0.079)
$\Omega = 0.5$	0.447	0.368	0.696	1.062	-0.027	0.223	0.464
	(0.070)	(0.086)	(0.158)	(0.156)	(0.039)	(0.056)	(0.078)
$\Omega = 0.7$	0.434	0.357	0.685	1.045	-0.026	0.217	0.450
	(0.068)	(0.083)	(0.155)	(0.153)	(0.038)	(0.055)	(0.076)
$\Omega = 0.9$	0.399	0.328	0.654	0.998	-0.024	0.199	0.413
	(0.062)	(0.076)	(0.148)	(0.146)	(0.035)	(0.050)	(0.069)

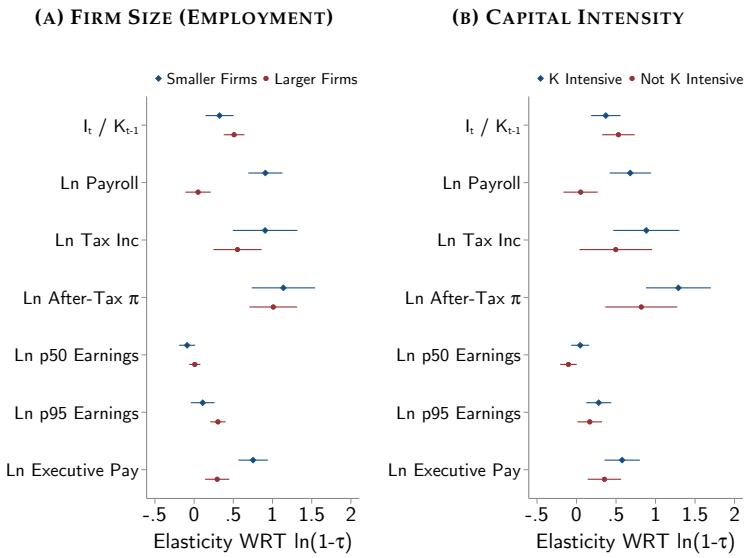
Notes: Row 1 reports benchmark net-of-tax elasticities using the marginal income tax rates reported in the main text. Rows 2-4 report elasticities with respect to the net-of-tax rate while varying the adjustment cost parameter, Ω. See above for details.

C.9 Heterogeneity

Existing research finds that the effects of tax changes may vary with firm size (if smaller firms face borrowing constraints, as in Zwick and Mahon 2017 and Saez et al. 2019), or by factor intensity (where capital-intensive firms may be most responsive, as in Acemoglu and Guerrieri 2008). We examine heterogeneity in the results across firms that vary in these characteristics. Smaller vs. larger firms are defined as those with above vs. below median employment in the first year the firm enters the sample. Capital intensity is defined at the industry level as the ratio of capital to sales in the pre-period, and the sample is split at the median.

Panels A and B of Appendix Figure 15 show that the elasticities do not appear to vary systematically with firm size or capital intensity. However, there is suggestive evidence that smaller firms were more likely to expand payrolls and increase executive pay, and that capital intensive firms exhibited a larger payroll elasticity. Although salary and wage expenses are fully tax deductible, the large payroll response suggests that hiring, training, and retaining workers may impose additional costs on firms that are not fully deductible in practice. These tests are suggestive of liquidity effects for small firms, and broadly consistent with price effects driven by reductions in the cost of capital for all firms.

APPENDIX FIGURE 15: FIRM HETEROGENEITY



Notes: The unit of analysis is a firm-year. The panels report heterogeneity in the net-of-tax elasticities for firms with varying characteristics. Smaller vs. larger firms are defined as those with above vs. below median employment in the first year the firm enters the sample. Capital intensity is the ratio of capital to sales at the industry level and the sample is also split at the median. All specifications control for firm and industry-size-year fixed effects and reweight the sample to match the joint industry-size distribution of firms in the pre-period. Error bars show 95% confidence intervals.

C.10 Evaluating Results at Longer Time Horizons

Researchers seeking to estimate the causal effects of TCJA's corporate tax cuts on firms and workers over longer time horizons must inevitably confront inference challenges posed by the COVID-19 pandemic. There are two overarching concerns. First, the internal validity of the research design comparing C and S corps may be violated by pandemic-era policies that differentially affected each firm type. Second, the external validity of estimates from this period may be low. We discuss both issues below.

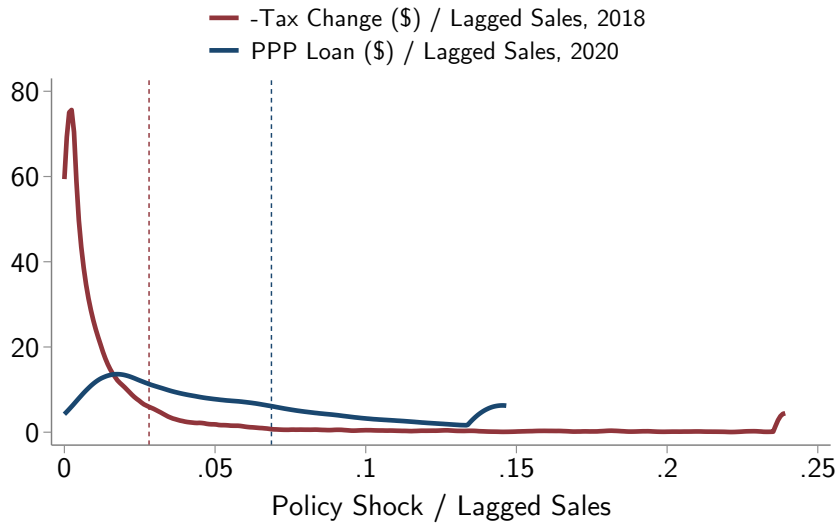
Internal Validity

A key concern is that pandemic-era policy may have differentially affected C and S corps and thus confound the research design beginning in 2020. Congress passed the Coronavirus Aid, Relief, and Economic Security (CARES) Act in March 2020 in response to the sharp recession caused by the pandemic. The Paycheck Protection Program (PPP), enacted as part of this law, offered financial support to eligible firms in the form of forgivable loans.

The purpose of PPP loans, as articulated by Congressional policymakers, was to encourage and incentivize business owners to continue employing and paying workers despite broad-based closures of businesses that were often mandated by state and local governments (U.S. Senate Committee on Small Business & Entrepreneurship 2020). Accordingly, the law required firms receiving PPP loans to spend at least 75% of their value on payroll costs, while the remaining 25% could be used to cover non-payroll expenses such as interest, rent, or utility payments. Loan amounts for eligible firms were determined primarily based on 2019 payroll expenses, as documented by firms in their loan applications.

The scope and magnitude of this stimulus was extremely large, with aggregate PPP loan volume of approximately $589 billion in 2020 and $209 billion 2021. For comparison, the $589 billion in the first year of the PPP program far eclipses the approximately $100 billion decline in corporate tax receipts in 2018, the year TCJA was first enacted (Congressional Budget Office 2019). To compare the magnitudes of the two shocks, we merge loan-level data from Splinter, Love, Heiser, and Mortenson (2026a; 2026b) onto our analysis sample. Among firms that claimed PPP loans in the sample, the average firm loan value in 2020 as a share of lagged revenue was approximately 2 times larger than the average firm tax cut scaled by lagged revenue in 2018. These distributions are shown in Appendix Figure 16, with the dashed vertical lines indicating the mean of each distribution.

APPENDIX FIGURE 16: TCJA VS. PPP LOANS



Notes: The unit of analysis is firms. The figure shows the distributions from the analysis sample of (a) the absolute value of negative tax changes in 2018, scaled by lagged sales, shown in red; and (b) the value of positive PPP loans in 2020 scaled by lagged sales, shown in blue. The red dashed vertical line indicates the mean value of tax cuts scaled by lagged sales, and the blue dashed vertical line indicates the mean value of PPP loans scaled by lagged sales. The average value of a PPP loan was approximately 2 times larger than the value of the average firm tax cut.

Appendix Table 10 investigates differential take-up of PPP loans for C versus S corps in the sample. Panel A reports results from linear probability models that regress PPP loan take-up (0/1) on an S corp indicator in the cross section of firms in the 2020 SOI sample. Column 1 includes no controls, column 2 adds industry controls, and column 3 adds controls for log sales and log payroll. S corps were significantly more likely to receive PPP loans than C corps, even after controlling for firm characteristics such as firm size and industry. The coefficient estimates indicate that S corps were around 17-20 percentage points (≈50%) more likely to claim a PPP loan than similar C corps. This finding of higher take-up for S corps is consistent with population-wide estimates of PPP loans documented in **?**.

Why were S corps more likely than C corps to claim PPP loans? It is likely that, for several reasons, the loans were more valuable to S corp owners, and so those owners were more likely to apply for loans. In particular, since S corp shareholders often directly manage their own firms and have substantial discretion to pay themselves wages (Smith et al. 2019), the shareholders were likely able to directly capture a large fraction of the transfer while still abiding by the legal terms of the loan. Moreover, the 25% portion of the transfer dedicated to covering non-payroll expenses may directly offset costs and increase after-tax profits.

APPENDIX TABLE 10: PPP LOAN TAKEUP FOR C VS. S CORPS

	(1) 0/1	(2) 0/1	(3) 0/1	(4) 0/1
s	0.209	0.168	0.163	
	(0.004)	(0.004)	(0.004)	
S $<$ 5 owners				0.186
				(0.004)
S 5-10 owners				0.157
				(0.007)
S 11-50 owners				0.074
				(0.009)
S $>$ 50 owners				0.006
				(0.013)
C Corp Mean	0.40	0.40	0.40	0.40
Industry FE	No	Yes	Yes	Yes
Size Controls	No	No	Yes	Yes
R2	0.04	0.13	0.22	0.23
N	371,229	371,229	371,229	371,229

Notes: The unit of analysis is a firm-year. The table shows results from a linear probability model that regresses an indicator for Paycheck Protection Program (PPP) take-up on an indicator for S corp status for all firms in the 2020 SOI corporate sample. Column 1 includes no controls, column 2 includes an industry fixed effect and column 3 includes controls for log sales and log payroll. Column 4 includes indicator variables for S corporations with less than 5 owners, S corporations between 5 and 10 owners, S corporations between 11 and 50 owners, and S corporations with more than 51 owners, industry fixed effects and controls for log sales and log payroll. Standard errors are clustered by firm.

For both C and S corp owners, after conditioning on payroll (and thus loan size), the value of a PPP loan is inversely related to the number of shareholders, simply because the windfall must be split among more of them. Because S corps have fewer shareholders, they thus had stronger incentives to apply for loans.

Appendix Table 10 Column 4 provides evidence consistent with this hypothesis. The table reports results from regressions of PPP take-up (0/1) on indicators for S corps with (a) fewer than 5 owners (i.e., shareholders), (b) 5-10 owners, (c) 11-50 owners, and (d) >50 shareholders. The specification includes industry fixed effects and firm size controls, and the reference category is take-up by C corps. Consistent with the reasoning above, the results show that the S corp take-up rate relative to C corps is steadily declining in the number of shareholders.[19]

Appendix Table 11 shows results from an identical set of specifications where the outcome is the log value of the loan, conditional on take-up. The table reports an unconditional log loan gap that favored S corps by 23.8% in column 1 and by 25.3% when controlling for industry fixed effects in

[19]Individual-level information about C corp shareholders are not observable in the data and so we cannot conduct a similar exercise among C corps. We expect that a similar pattern would emerge if the data existed.

column 2. The gap shrinks to 6.6% in column 3 after controlling for firm size variables, consistent with the eligibility determinants. Column 4 does not reveal a clear monotonic relationship between loan values and the number of S corp shareholders, conditional on take-up.

APPENDIX TABLE 11: PPP LOAN AMOUNTS FOR C VS. S CORPS, CONDITIONAL ON TAKE-UP

	(1) Ln(Amount)	(2) Ln(Amount)	(3) Ln(Amount)	(4) Ln(Amount)
s	0.238	0.253	0.066	
	(0.015)	(0.015)	(0.010)	
S $<$ 5 owners				0.061
				(0.010)
S 5-10 owners				0.101
				(0.016)
S 11-50 owners				0.060
				(0.035)
S $>$ 50 owners				-0.119
				(0.144)
C Corp Mean (mil)	1.46	1.46	1.46	1.46
Industry FE	No	Yes	Yes	Yes
Size Controls	No	No	Yes	Yes
R2	0.01	0.08	0.62	0.62
N	183,081	183,081	183,081	183,081

Notes: The unit of analysis is a firm-year. The table shows results from a model that regresses the log dollar value of Paycheck Protection Program (PPP) loan values on an indicator for S corp status for all firms in the 2020 SOI corporate sample. Column 1 includes no controls, column 2 includes an industry fixed effect and column 3 includes controls for log sales and log payroll. Column 4 includes indicator variables for S corporations with less than 5 owners, S corporations between 5 and 10 owners, S corporations between 11 and 50 owners, and S corporations with 51 or more owners, industry fixed effects and controls for log sales and log payroll. Standard errors are clustered by firm.

Differential take-up of PPP loans poses a threat to the identification strategy for several reasons. As documented above, the average firm loan amount was economically large — significantly larger than our estimate of the average firm tax cut due to TCJA. Moreover, other researchers have documented that PPP loans measurably impacted firm outcomes. E.g., Autor et al. (2022), Dalton (2025), and **?** find that PPP loans increased wages and employment, and Hubbard and Strain (2020), **?**, Kurmann et al. (2021), Autor et al. (2022), and Dalton (2025) find that PPP loans reduced permanent closures.

The confounding influence of PPP loans imply it is challenging to sign the direction of treatment bias from PPP loans using the C vs. S research design. If loans improved outcomes for recipient firms, take-up bias favoring S corps may increase levels of e.g. capital and employment in S corps relative to C corps, and attenuate causal estimates of the effects of TCJA's tax cuts. But if PPP loans buoyed declining firms that otherwise would have permanently closed, this would generate non-random sample attrition. In that case, declining C corps would disappear from the data while comparable declining S firms would survive, artificially inflating treatment effect estimates from the C vs. S design.

Disentangling the effects of the two overlapping policy interventions requires an alternate research design with multiple instrumental variables. We consider this a worthy ambition, but one that is beyond the scope of this paper.

A further concern is that if ownership structure affected PPP loan take-up in 2020, perhaps it also affected how S and C firms responded to TCJA's tax cuts in 2018 and 2019. This is unlikely for two reasons. First, Appendix C.1 provides direct evidence that C and S corps historically responded similarly to tax shocks, despite their different ownership structures. Second, in contrast to the pandemic-era relief programs, in the 2013 to 2019 period there were no analogous large-scale policies with elective take-up that specifically linked ownership structure to a substantial government-funded windfall or tax benefit.

External Validity

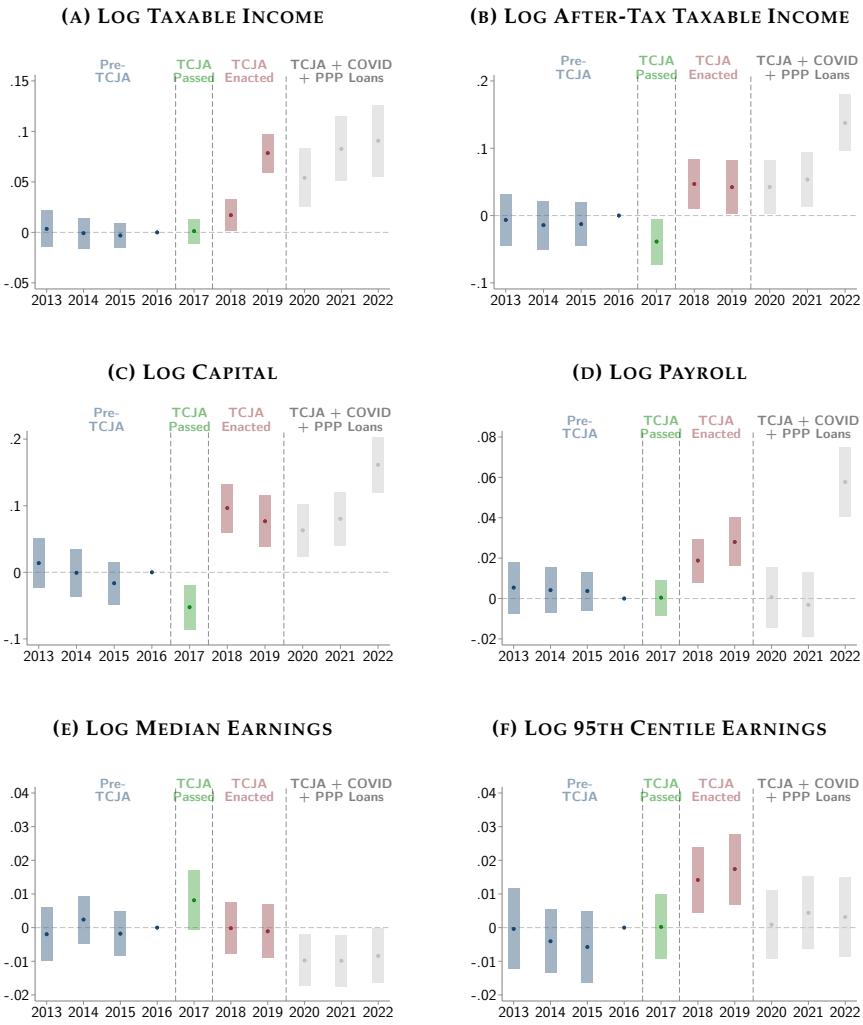
Extending the sample through COVID and the subsequent period of high inflation and macroeconomic volatility further raises concerns about external validity. Existing research finds that investment, for example, is highly sensitive to uncertainty (Bloom et al. 2007, Baker et al. 2024, Alfaro et al. 2024), and is more strongly pro-cyclical than other components of GDP (Andrle et al. 2016). Against the backdrop of the recession, inflation, and sharply elevated uncertainty during the 2020-2022 period (Altig et al. 2020), tax cuts might have muted effects on capital investment and labor markets, even if tax cuts would increase investment and labor demand in a more stable and predictable macroeconomic environment.

Evaluating Results at Longer Horizons

The considerations above imply that, for the post-pandemic period, the internal validity of the C vs. S research design is likely to be weak and external validity is likely to be low. Thus we emphasize that analyses of this period must be interpreted with care and caution. Nevertheless, below in Appendix Figure 17 we present estimates from event studies that extend the sample to 2022 (the most recent year of SOI data available) and attempt to offer interpretations of the results.

Panels A-C of Figure 17 show that pre-tax profits, after-tax profits, and depreciable capital remained elevated in C corps relative to S corps in the 2020-2022 period. These results are plausibly consistent with the view that the corporate tax cuts generated persistent and perhaps growing gains for firms. Panels D-F by contrast indicate that payroll and wage gains of C corps relative to S corps were eroded during the pandemic. This is perhaps not surprising, since PPP loans disproportionately benefited S corps and were implemented with the explicit legal purpose of increasing employment and wages of recipient firms.

APPENDIX FIGURE 17: EVENT STUDIES AT A 5-YEAR HORIZON



Notes: In response to the COVID-19 pandemic, in 2020 and 2021 the US federal government distributed more than $800 billion in Payroll Protection Program (PPP) loans, which disproportionately flowed to S corporations and threaten the internal validity of the research design starting in 2020, particularly for payroll and wage outcomes (see above for additional discussion). These estimates should thus be interpreted with care and caution. The unit of analysis is a firm-year. The panels plot the β_t coefficients from the main event studies, adding estimates for years 2020-2022. The coefficients capture average differences in outcomes between C and S corps over time after controlling for firm and industry-size-year fixed effects and reweighting the sample to match the joint industry-size distribution of firms in the pre-period. The declines in taxable income and after-tax income in 2017 in Panels A and B reflect intertemporal income shifting by firms; see Appendix C.3. Standard errors are clustered by firm and error bands show 95% confidence intervals. See Section II and Appendix B for data and measurement details.

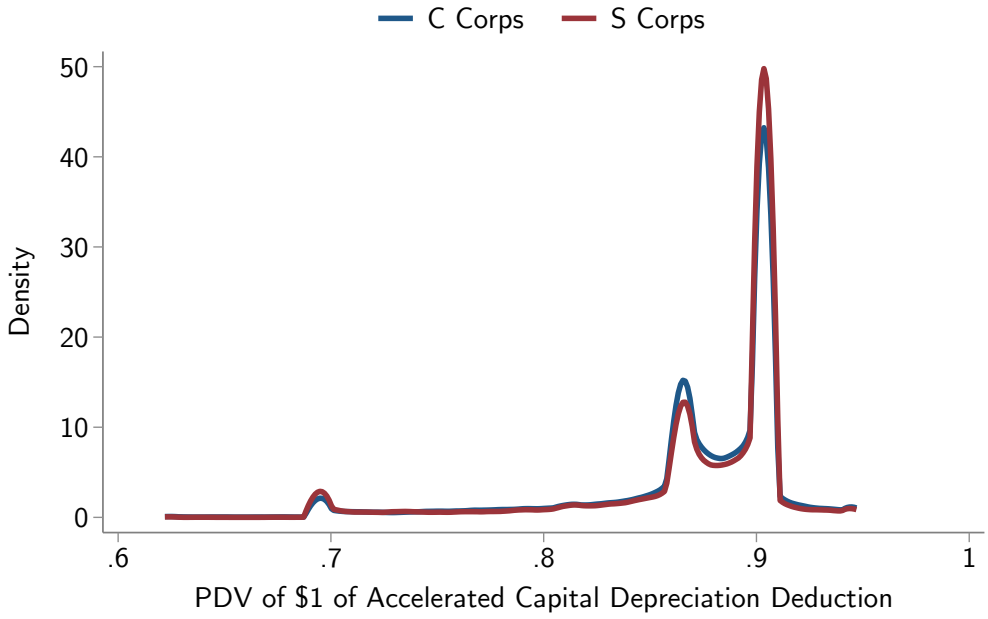
C.11 Bonus Depreciation

We assess the relevance of expensing (also called bonus depreciation) in the research design in several ways.

First, Appendix C.1 documents that C and S firms responded virtually identically to changes in accelerated depreciation policies in the past. This does not rule out potential interactions between bonus and the tax rate, but it does restrict the set of possible effects. If C and S corps responded heterogeneously to expensing changes, our research design would be unable to disentangle their effects relative to changes in tax rates. However, that does not appear to be the case empirically.

Second, we document below that exposure to expensing was highly similar among C and S corps in our data sample in the pre-TCJA period. Specifically, we use the methodology of Zwick and Mahon (2017) to compute firm-specific measures of the present discounted value of $1 of accelerated depreciation deductions in the pre-period using empirically observable data on their asset-type mix from IRS Form 4562. If C and S firms were differentially exposed to expensing changes, it would be more challenging to disentagle the effects of bonus versus tax changes. The distributions below show that this does not appear to be the case empirically.

APPENDIX FIGURE 18: EXPOSURE OF C AND S CORPS TO BONUS DEPRECIATION



Notes: The figure plots the unweighted distributions of the present discounted value (PDV) of $1 of a bonus depreciation deduction in 2016 for C and S corps in the analysis sample, using the methodology of Zwick and Mahon (2017) at the firm level. To improve the data visualization the plot excludes observations where the outcome is zero.

Third, we estimate the paper's reduced form equation 2, modified to include interactions of the pre-TCJA bonus exposure measure z with a $Post_t$ indicator and a $C_f \times Post_t$ indicator. These results are reported below. Column 1 reports results with no interaction. Column 2 includes the interaction term and reports results where we construct the pre-TCJA bonus exposure measure z_f at the firm level. Column 3 reports results where we construct the pre-TCJA bonus exposure measure z_i at the industry level. Adding $z \times Post$ in column 2 absorbs any post-TCJA change in investment that varies with expensing exposure and is common to C and S firms. The stability of the $C \times Post$ coefficient suggests the baseline C vs. S differential is not primarily driven by differential expensing exposure across entity types. The estimated $C \times z \times Post$ interaction is negative and statistically significant, implying the C vs. S differential is smaller for firms with greater expensing exposure. Using an industry-level expensing exposure measure, the corresponding interaction term in column 3 remains negative but is not statistically significant. Broadly, however, the negative point estimates for $C \times z \times Post$ are consistent with the theoretical prediction that rate sensitivity is smaller for firms with greater expensing exposure.

APPENDIX TABLE 12: INTERACTIONS OF BONUS EXPOSURE AND TAX CHANGES

	(1) $I_{ft}/K_{f,t-1}$	(2) $I_{ft}/K_{f,t-1}$	(3) $I_{ft}/K_{f,t-1}$
$C_f \times Post_t$	0.026	0.027	0.026
	(0.004)	(0.004)	(0.004)
$C_f \times Post_t \times z_f$		-0.027	
		(0.004)	
$C_f \times Post_t \times z_i$			-0.006
			(0.004)
Firm FE	Yes	Yes	Yes
Industry-Size FE	Yes	Yes	Yes
N	204,411	204,411	204,411

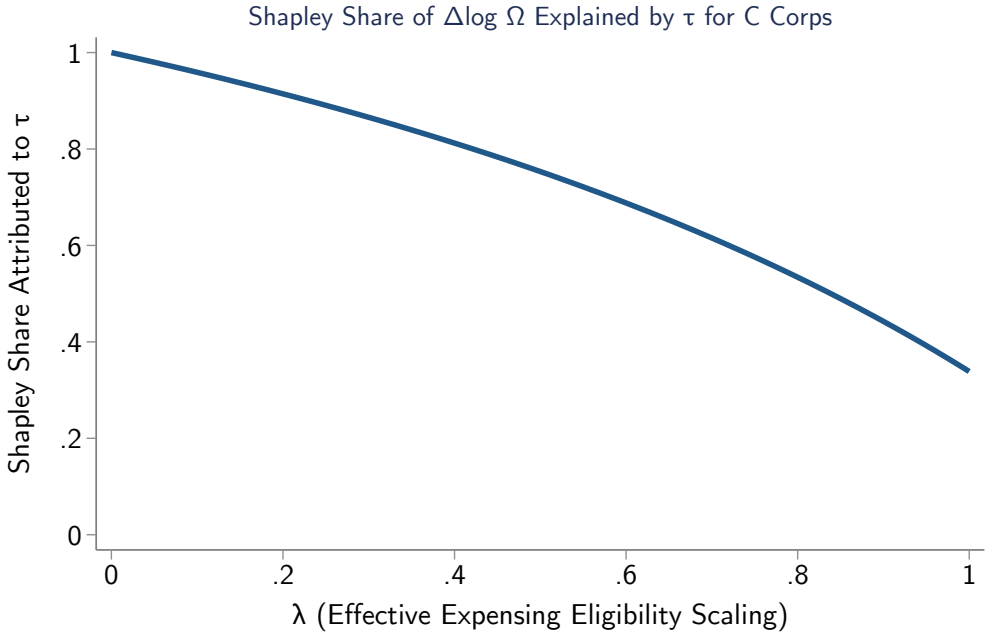
Notes: The unit of analysis is a firm-year. The outcome is net investment scaled by lagged capital. Column 1 reports the $C \times Post$ coefficient from equation 2, which estimates average differential changes in investment between C and S corps before and after TCJA controlling for firm and industry-size-year fixed effects and reweighting the sample to match the joint industry-size distribution of the sample in the pre-period. Standard errors are clustered by firm. Columns 2 and 3 also include an interaction between $C \times Post$ and a firm-level and industry-level measure of pre-TCJA bonus depreciation exposure, respectively, constructed following Zwick and Mahon (2017). In column 2 the specification includes an indicator for observations where pre-period firm-level exposure is not observable in the data.

Fourth, to quantify the share of the change in the user-cost tax term $\Omega(\tau, z; \lambda) = (1 - \lambda z \tau)/(1 - \tau)$ that is plausibly driven by the changes in the statutory tax rate versus expensing in a user cost calibration, and to show how this depends on the effective take-up parameter λ, we perform a Shapley decomposition using the mean parameters in Appendix Table 2 and vary λ from 0 to 1. Because Ω is nonlinear in τ and z, the marginal contribution of each component depends on the order in which changes are applied. The Shapley decomposition resolves this by averaging each component's marginal effect across the two possible orderings (τ then z, and z then τ). Letting $F(\tau, z; \lambda) \equiv \log \Omega(\tau, z; \lambda)$ the Shapley contribution of the tax-rate change is given by:

$$\Delta_{\tau}^{Sh} = \tfrac{1}{2}\Big(\big[F(\tau_1, z_0; \lambda) - F(\tau_0, z_0; \lambda)\big] + \big[F(\tau_1, z_1; \lambda) - F(\tau_0, z_1; \lambda)\big]\Big)$$

with an analogous expression for expensing, $\Delta_{\tau}^{Sh} + \Delta_{z}^{Sh} = F(\tau_1, z_1; \lambda) - F(\tau_0, z_0; \lambda)$. To illustrate the results from the decomposition, Figure 19 plots Δ_{τ}^{Sh} against values of $\lambda \in [0, 1]$. In the benchmark parameterization where $\lambda = 0.6$, the decomposition implies that approximately 70% of the change in $\log \Omega$ for C corps is attributable to the tax rate change and 30% to expensing. The relative importance of expensing in driving the change in user costs rises is positively correlated with λ. Kitchen and Knittel (2016) document that bonus take-up rates empirically vary between 50-70% for C and S corporations, suggesting an approximate range of Δ_{τ}^{Sh} between 62-75%.

APPENDIX FIGURE 19: DECOMPOSING THE ROLE OF τ AND z IN THE TAX TERM



Notes: The figure plots the Shapley share of the change in the user-cost tax term, $\Delta \log \Omega(\tau, z; \lambda)$, that is attributed to the statutory tax-rate change for C corporations as the effective take-up parameter λ varies from 0 to 1. We define $\Omega(\tau, z; \lambda) = (1 - \lambda z \tau)/(1 - \tau)$ and compute the Shapley contribution of τ as the average marginal effect of changing τ holding z fixed at its pre-TCJA value and at its post-TCJA value. Parameter values for τ and z are the pre- and post-TCJA means reported in Appendix Table A.2. $\lambda = 0.5$ corresponds to the baseline calibration.

C.12 Market-Level Analysis Placebo / Pre-Trend Test

The identifying assumption of the market-level research design is parallel trends in the absense of treatment (Borusyak, Hull, and Jaravel 2025). While this assumption is not directly testable, Appendix Table 13 reports placebo tests where the outcome is lagged by four periods to test for pre-trends. The placebo elasticities are economically small and statistically insignificant. The parallel trend assumption is consistent with the evidence from the pre-period.

APPENDIX TABLE 13: MARKET-LEVEL PRE-TREND TESTS

	(1)	(2)	(3)	(4)
	Panel A: Log Median Earnings			
$\ln(1-\tau_{mt})$	-0.112	0.033	-0.109	-0.089
	(0.333)	(0.234)	(0.086)	(0.081)
	Panel B: Log 95th Centile Earnings			
$\ln(1-\tau_{mt})$	0.088	0.143	-0.033	-0.037
	(0.291)	(0.281)	(0.042)	(0.040)
Market	State-Ind	State-Ind	State	State
Market FE	Yes	Yes	Yes	Yes
State-Year FE	Yes	Yes	No	No
Ind-Year FE	Yes	Yes	No	No
Year Fe	No	No	Yes	Yes
Controls	No	Yes	No	Yes
First Stage F	133	136	229	239
N	6,195	6,195	204	204

Notes: The unit of analysis is an state-industry-year in columns 1 and 2, and a state-year in columns 3 and 4. The outcome is log median earnings in Panel A and the log 95th centile earnings in Panel B. The outcomes are lagged by four years as a placebo check. The panels estimate equation 9, instrumenting the sales-weighted log net-of-tax rate with the pre-TCJA sales-weighted share of C corps in each market. Columns 1 and 2 include market fixed effects, state-year fixed effects, and industry-year fixed effects, with standard errors multiway clustered by state and industry. Columns 3 and 4 include state and year fixed effects and are clustered by state. Columns 2 and 4 include time-varying controls for average worker age.

D Appendix to Section IV: Incidence

D.1 Alternate Assumptions About Capital Supply

The distributional incidence estimates reported in Section 5 provide a conservative lower bound for the short-run effects of the tax cuts on after-tax income dispersion. In the empirical analysis and the incidence quantification, lower income households do not see changes in wages but do benefit from increased corporate profits via their holdings of corporate equities (e.g., in 401K, pension, or retail investment accounts). The baseline assumption in this analysis, consistent with the benchmark modeling assumptions in Chodorow-Reich et al. (2025) and Barro and Furman (2018), is that capital supply is perfectly elastic, implying that tax-induced increases in after-tax profits do not reflect higher returns to capital broadly but rather accrue via increases in output and/or via firm-specific economic rents, such as those arising from proprietary technology, fixed factors, market power, regulatory advantages, or information frictions.

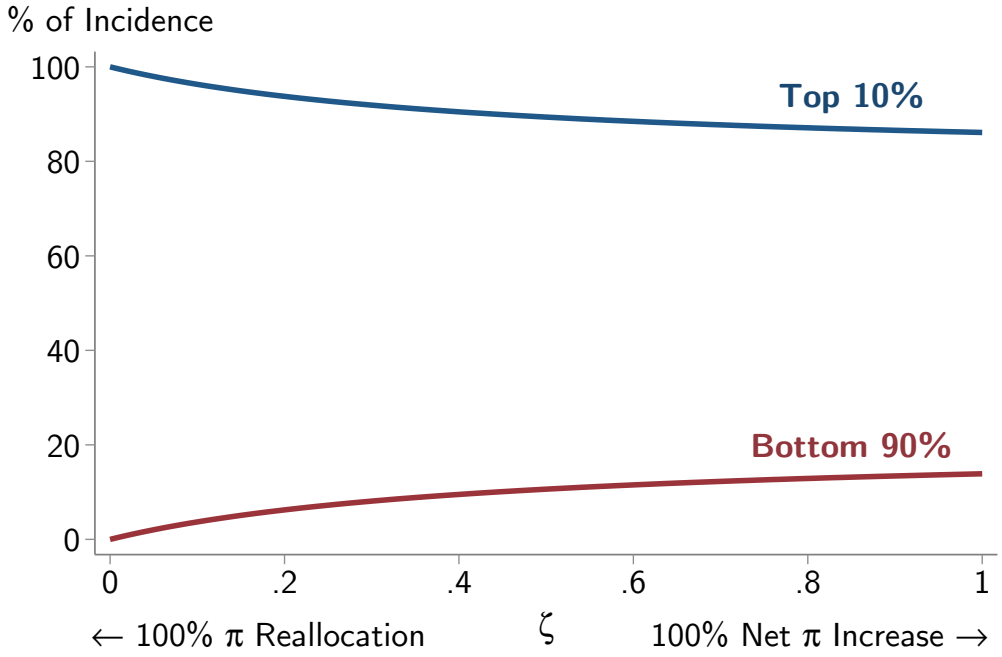
However, if capital supply is imperfectly elastic, this raises the possibility that the difference-in-difference (DiD) elasticity captures, in part, reallocation of profits among firm owners rather than net positive aggregate business income. In the extreme case where changes in after-tax profits reflect only reallocation of business income rather than aggregate net increases, the relevant market-level after-tax profit elasticity for incidence analysis is effectively zero. To assess how varying assumptions about profit reallocations affect our incidence estimates with respect to income, we use the following variation of equation 14:

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

where the introduction of the parameter ζ captures the share of after-tax profits from the DiD elasticity that represent net increases in capital income rather than reallocation. The case where $\zeta = 1$ corresponds to the benchmark assumption of perfectly elastic capital supply (or, not mutually exclusively, to the case where shareholders earn firm-specific economic rents, such as those arising from proprietary technology, fixed factors, market power, regulatory advantages, or information frictions). The extreme opposite case where $\zeta = 0$ corresponds to perfectly inelastic capital supply, such that all gains for shareholders of C corporations are offset by losses for shareholders of S corporation. The values in between represent intermediate cases.

Figure 20 illustrates how the distributional results in Table 10 Panel B vary with alternate assumptions about ζ. Relative to the benchmark case where $\zeta = 1$, the figure shows that alternate assumptions that generate lower gains for firm shareholders also indirectly generate lower gains for the households in the bottom 90% of the income distribution. Because lower-income households do not see wage gains from the tax cuts, they benefit only from their holdings of corporate equities. The benchmark case thus represents a conservative lower bound with respect to the paper's headline finding that approximately 87% of private income gains flow to the top 10% of the income distribution in the short run.

APPENDIX FIGURE 20: DISTRIBUTIONAL INCIDENCE UNDER ALTERNATE ASSUMPTIONS ABOUT CAPITAL SUPPLY

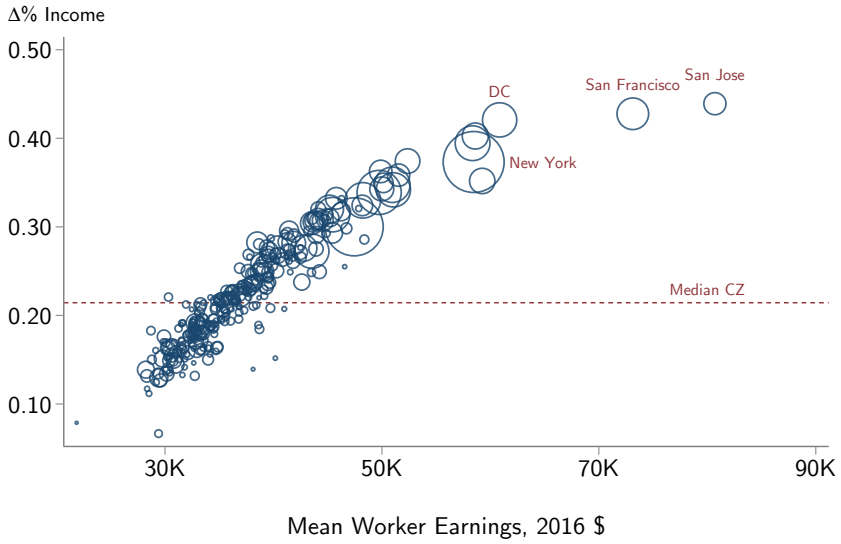


Notes: The figure illustrates how the distributional incidence results in Section IV change with varying assumptions about the parameter ζ, which captures the share of after-tax profits that represent net increases in capital income rather than reallocation of capital income. See above for details.

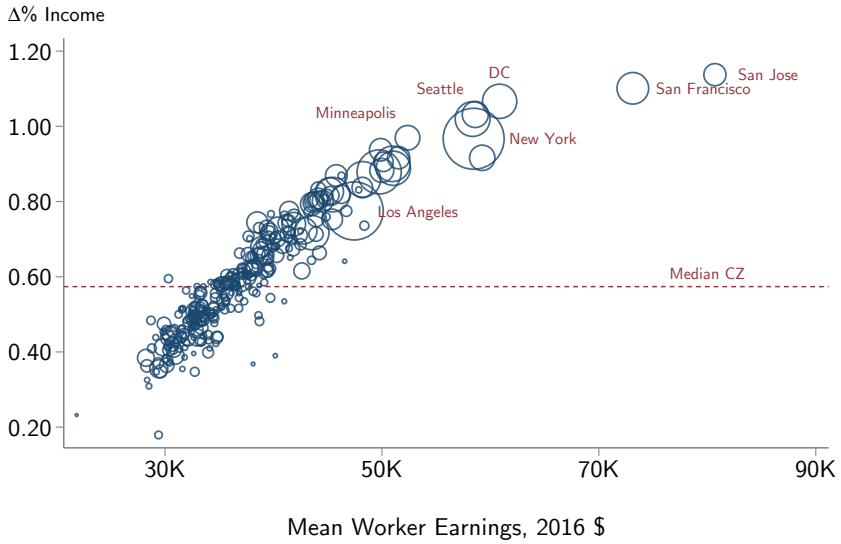
D.2 Geographic Incidence

Appendix Figure 21: Change in Per Capita Income vs. Initial Worker Earnings

(a) Main Analysis Sample



(b) Extrapolation Including Large Firms



Notes: The unit of analysis is a commuting zone. The figures plot the estimated percent 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. Panel A presents results for the main sample. The sample in Panel B includes large C corporations; see Appendix D.3.

D.3 Incidence Extrapolation to Large Firms

The incidence estimates reported in Table 10 are based on sample moments and elasticities estimated from the benchmark sample exlcuding the top 0.001% of firms. The very largest firms are exclusively C corporations, many of which are publicly traded and have multinational operations. Table 14 extrapolates the incidence results to these large firms. To do so, we re-estimate the moments from Table 9 Panels A and B using an SOI sample that includes these large firms. We otherwise use the same parameters as in Table 9 Panels C-E. A key difference vis-a-vis the benchmark estimates is that capital comprises a larger share of value added among the very largest firms (≈25%) relative to those in the main sample (≈16%). Relative to Table 10, extrapolating the results to large firms yields larger gains for capital relative to labor in response to corporate tax cuts, and a modestly larger share of incidence on foreigners.

APPENDIX TABLE 14: INCIDENCE INCLUDING LARGE C CORPS

	(1) **C Corps**	(2) **S Corps**	(3) **All Corps**	(4) **U.S. Pop.**
	% (se)	% (se)	% (se)	%
Panel A: By Factor				
Capital	73 (6)	80 (4)	75 (5)	n.a.
Executives	5 (1)	11 (2)	7 (1)	<1
High-Paid Workers	22 (4)	9 (2)	18 (3)	10
Low-Paid Workers	0 (3)	0 (2)	0 (3)	90
Panel B: By Income				
Top 1%	35 (2)	64 (2)	41 (2)	1
91-99th%	50 (3)	25 (1)	44 (2)	9
Bottom 90%	15 (3)	10 (3)	15 (2)	90
Panel C: By Geography				
Foreign	25 (2.0)	0 (0.0)	13 (0.9)	n.a.
Domestic	75 (2.0)	100 (0.0)	87 (0.9)	100
Of which:				
Northeast	29 (0.3)	35 (0.3)	33 (0.2)	19
Midwest	23 (0.2)	23 (0)	22 (0.2)	21
South	21 (0.3)	19 (0.1)	19 (0.1)	36
West	28 (0.2)	23 (0.1)	26 (0.1)	24

Notes: The table estimates incidence from an SOI sample that includes very large C corporations. The moments from Table 9 Panels A and B are re-estimated using the expanded sample. The parameters from Table 9 Panels C-E are unchanged.

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