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ABSTRACT

We assess the business provisions of the 2017 Tax Cuts and Jobs Act, the biggest corporate tax cut in US history. We draw five lessons. First, corporate tax revenue fell by 40 percent due to the lower rate and more generous expensing. Second, firms with larger declines in their effective tax wedge increased investment relatively more. In aggregate, we suggest a loose consensus from the literature that total tangible corporate investment increased by 11 percent. Third, the business tax provisions increased economic growth and wages by less than advertised by the Act's proponents, with long-run GDP higher by less than 1% and labor income by less than \$1,000 per employee. Fourth, provisions that increase foreign investment by US-based multinationals also boost their domestic operations. Fifth, some of the expired and expiring provisions, such as accelerated depreciation, generate more investment per dollar of tax revenue than others.

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In 2017, the United States passed the biggest business tax cut in its history—the Tax Cuts and Jobs Act—which was projected to reduce corporate tax revenue by \$100 to \$150 billion per year for a decade (Joint Committee on Taxation, 2017; Congressional Budget Office, 2018). The key provisions included cutting the top statutory tax rate on corporate income from 35 to 21 percent, allowing firms to write off equipment purchases immediately (rather than depreciating them more slowly), and introducing a new regime for taxing foreign source income, along with several other changes. Proponents of the legislation highlighted the potential for lower business taxes to boost investment, wages, and US competitiveness—even to generate revenues to offset some of its costs. Skeptics emphasized that tax cuts increase the deficit and primarily benefit high-income people and otherwise-nontaxable owners, including foreigners, university endowments, and pension funds.

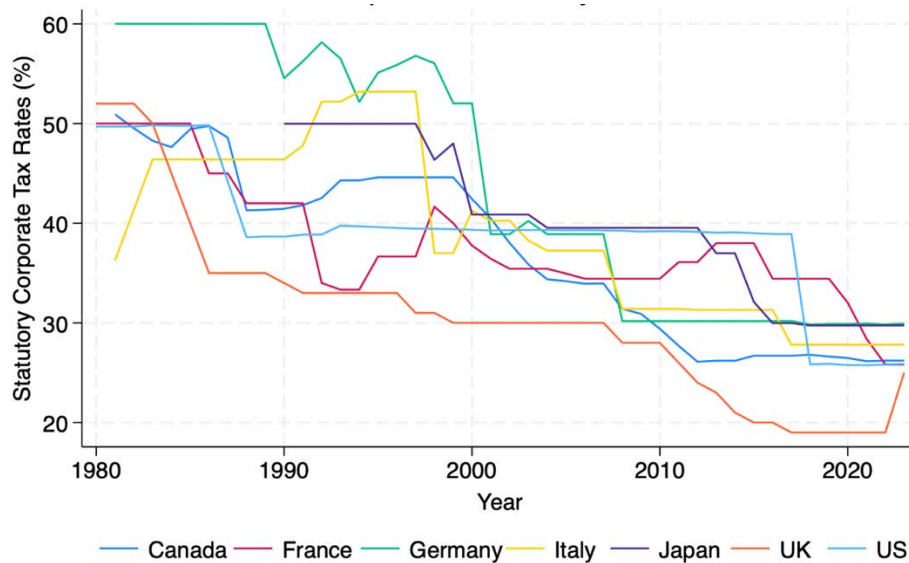
This paper provides a framework for assessing the corporate taxation aspects of the Tax Cuts and Jobs Act. We describe the nature of this historic policy shock, summarize the state of knowledge on its costs and benefits, and discuss implications for the future of business tax policy in the United States. We build on empirical work since the passage of the 2017 legislation, including recent and not-yet published research, as well as earlier findings. We describe not only partial equilibrium results, but also aggregate effects on investment, tax revenue, and GDP. We compare these actual aggregate outcomes to the predictions of policymakers. We focus here on domestic effects; the companion paper in this symposium by Kimberly Clausing considers international issues.

We draw five lessons. First, and most obvious, large corporate tax cuts are expensive and increase the deficit substantially. Specifically, the reform reduced corporate tax revenue by 40% of the pre-reform level. Second, taxes matter for corporate investment. Firms facing larger corporate tax cuts invested more than firms facing smaller cuts. Three approaches—using a quantitative macro model that incorporates actual firm-level responses and non-corporate sectors, comparing investment of U.S. firms to similar non-U.S. firms, and comparing aggregate investment to pre-reform forecasts—all indicate positive responses in total tangible corporate investment of 8 to 14 percent. This response was far too small to offset the direct cost of the reform. Third, domestic tax treatment of profits abroad can have important effects on investment at home: for example, provisions that increase foreign investment by US-based multinationals also boost their domestic operations. Fourth, the effects on economic growth and wages were smaller than advertised. Specifically, model-based predictions—disciplined to fit actual short-run investment effects—indicate a long-run increase in wages equivalent to \$750 at the time of the law’s passage. This impact is roughly an order of magnitude below the \$4,000 to \$9,000 range predicted before the passage of the law by the Council of Economic Advisers (2017). Fifth, the economic bang for the fiscal buck varies across different tax provisions. For example, it matters whether corporate tax reform encourages new capital via investment incentives, rather than by enriching old capital via corporate income tax rate cuts.

Policy Context

Business taxation involves trade-offs. Total tax receipts from corporate and pass-through income tax receipts equaled 2.9 percent of GDP in 2017. In addition to providing tax revenue, other benefits of taxing business income include reducing the scope for tax avoidance and evasion---which tend to rise with the gap between the tax rate on capital and labor income---and improving post-tax equity---because business owners as a group tend to have higher incomes and wealth. Furthermore, only one-quarter of US corporate equity is owned by those who pay US taxes on dividends and capital gains (Rosenthal and Micculo 2024). The corporate tax therefore provides an indirect way for annual taxation of equity held by foreigners, nonprofits, and pensioners. On the other side, the main cost of taxing business income is the disincentive to accumulate capital, start new businesses, and grow existing ones, which ultimately results in lower national income.

Figure 1: Time Series of Rates in Some High-Income Countries



Source: Tax Foundation. Corporate Tax Rates Around the World, 2023

<https://taxfoundation.org/data/all/global/corporate-tax-rates-by-country-2023/>

Note: This figure plots the evolution of the statutory corporate tax rate for each country in the G7.

As business tax policy seeks to balance these issues, four main considerations arise.

1. What should the rate structure of the corporate income tax look like? On the eve of the Tax Cuts and Jobs Act of 2017, the US top income bracket statutory corporate rate was 35 percent and had not changed from 1993 to 2017. The top rate had previously fallen from 46 percent to 40 percent in the Tax Reform Act of 1986 and further to 34 percent in 1988. At that time, the United States had the second-lowest corporate rate among the group of comparison countries shown in Figure 1. Between 1988 and 2017, every other country in this group reduced its top corporate rate, such that in 2017 the United States had the highest corporate tax rate among this group.

2. What expenses should a business be allowed to deduct from revenues to arrive at taxable income? A common pattern across countries is that firms are allowed to deduct costs such as wages or the cost of goods sold immediately while spreading the cost of new capital investment over several years. Some expenses like research and development activity receive additional tax credits to encourage innovation. Many countries also allow firms to deduct part or all of interest payments.

There is a lively debate over the relative roles of corporate income tax rates versus expanded incentives for investment. One view is that, in general, the best way to increase competitiveness is to broaden the corporate tax base by limiting deductions and lowering the statutory tax rate. An alternative view is that a targeted approach is better. Broadening the corporate tax base raises the cost of capital and discourages new investment for firms that might be especially responsive to taxes. In this view, lowering the tax rate for everyone is a blunt instrument: while a lower rate does make new investments more attractive, it also boosts the after-tax returns to past investments (i.e., so called “old capital”). Paying more for past investment is unattractive because it spends resources for activity it cannot change. In other words, it is a transfer from taxpayers to capital owners, with little bang for the buck in terms of new economic activity. This alternative view suggests that a combination of higher corporate tax rates and incentives for investment might make sense.

Prior to the Tax Cuts and Jobs Act, the United States had relatively generous depreciation allowances, as businesses could deduct 50 percent of new equipment investment immediately (“bonus depreciation”) before deducting the remainder according to the normal IRS cost recovery schedules. However, even after accounting for the generosity of expensing and other credits and deductions, Foertsch (2018) finds the United States in 2017 had among the highest effective tax rates on new investment in the OECD (although this conclusion is somewhat sensitive to the treatment of property and wealth taxes).

3. How does the corporate income tax system apply to a firm’s foreign source income? Before the Tax Cuts and Jobs Act, the United States operated a “worldwide” system that included the foreign income of US multinationals. But it allowed firms to (indefinitely) defer paying tax until they repatriated this income from their foreign subsidiaries. By contrast, at that time the other high-income countries all operated “territorial” systems that only taxed domestic income. These differences persisted against a backdrop in which deepening globalization drove corporate strategy, investment, and location decisions, and tax competition among countries raised concerns that firms could shift much of their income to avoid tax. At a fundamental level, the question is whether corporate taxation should be based on where goods and services are produced (source-based), where they are sold (destination-based), or where the owners live (residence-based)?

4. At what level is business income taxed? The US system distinguishes between “C-corporations” and “pass-through” firms such as sole proprietorships, partnerships, and “S-corporations”. C-corporations include all publicly-traded firms as well as some privately-held firms. These firms face the corporate income tax. Pass-throughs include many architecture firms, physician offices, auto dealerships, beverage distributors, consulting and law firms, and other

small- and mid-market regional businesses. The income of these firms “passes through” each year to the owners’ personal income. As a result, the owners pay individual income tax on profits each year and so pass-through firms do not face corporate income tax. Pass-through firms make up about 95 percent of all firms, but they account for only about half of business income.

Well before the Tax Cuts and Jobs Act of 2017, both political parties had at different times altered or put forward proposals to reform business taxation. For example, during the Bush administration, the Job Creation and Worker Assistance Act of 2002 introduced “bonus depreciation” as a stimulus incentive for new investment, which continued in some form for every year (except 2005-2007) up until the 2017 tax legislation. During the Obama administration, the White House released a framework for business tax reform that called the existing US tax system “uncompetitive and inefficient.” The proposal included reducing the top corporate rate to 28 percent, ending bonus depreciation, limiting the deductibility of interest expenses, and creating a new minimum tax on foreign source income (White House and Department of the Treasury, 2012).

The stated objective of the Trump administration and supporters of the Tax Cuts and Jobs Act of 2017 was to increase global competitiveness and boost investment. The reform’s architects emphasized the need to align the US system with other countries by lowering the statutory rate and moving to a territorial system (Council of Economic Advisers, 2018). The Act also reduced tax rates for pass-throughs, with the goal of maintaining approximate parity in effective rates between C-corporations and pass-throughs, thereby discouraging pass-throughs from reorganizing as private C-corporations to reduce their tax burdens. Another factor was political pressure, as the pass-throughs represent a politically powerful constituency of “small” businesses with substantial sway in Congress (Atkinson and Lind (2018).

A Framework for the Effect of Business Taxes on Investment and Wages

In the canonical neoclassical model of investment, a firm chooses capital and hires workers to maximize the payout to the firm’s owners. The economic incentives from corporate taxes can be summarized by two tax parameters governing the investment decision: a marginal tax rate on income from new investment (denoted by τ) and a cost-of-capital subsidy (denoted by Γ) that incorporates the present value of depreciation deductions and any investment tax credits.

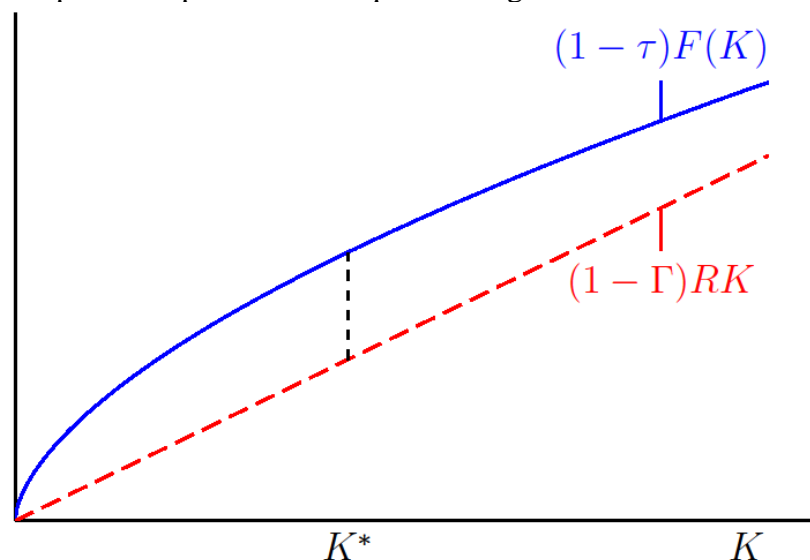
Figure 2 illustrates the firm’s decision problem. A firm with a capital stock of K has pre-tax earnings of $F(K)$ and after-tax profits of $(1-\tau)F(K)$, shown by the solid blue curve. To maintain its capital stock, the firm must pay a per-unit-of-capital user cost of $(1-\Gamma)R$, which gives the slope of the dashed red line. The user cost has the interpretation of the cost of buying a unit of capital, using it for a period, and then selling the remaining (non-depreciated) capital in the next period. Investment incentives lower the user cost because they reduce the effective acquisition cost of capital by a fraction Γ . Without investment tax credits, this fraction Γ is equal to the product of the income tax rate on new investment τ and the present discounted value of depreciation deductions, which is usually denoted by z (for example, Zwick and Mahon, 2017).

The optimal choice of capital, K^* , maximizes the difference between the blue curve and the red line, shown in Figure 2 by the vertical dashed line at K^* ,

This simple framework shows that either more generous investment incentives or a lower tax rate on profits will induce the firm to maintain a higher stock of capital. Indeed, the tax incentives for investment can be conveyed in a single expression, given by the ratio of the price of capital net of the cost-of-capital subsidy to the net-of-corporate-tax rate—that is, $(1-\Gamma)/(1-\tau)$.

How much a policy change will stimulate investment therefore depends on the change to this wedge and how quickly the pre-tax marginal benefit decreases as firms accumulate capital, which in turn depends on considerations such as diminishing returns to scale or the nature of product demand. The implications for wages in turn follow because higher levels of capital-per-worker raise the marginal product of labor.

Figure 2: Optimal Capital Choice Equates Marginal Benefit and Cost of Capital



Source: Authors' calculations.

Note: This figure demonstrates the optimization problem a firm faces when determining its capital stock K . Firms maximize the difference between after-tax profits (the blue line) and cost of capital (the red line) at K^* .

We highlight six extensions to this baseline model which help to bring it closer to the real-world complexity: multinational production, adjustment costs, financing structure, heterogeneous capital types, intangibles, and pass-throughs and non-taxed sectors.

First, one can extend the canonical model for multinational firms to include both domestic and foreign capital as factors in the production function (see Chodorow-Reich et al. (2024)). With interdependence, changes to the tax code that affect the user cost or return to foreign capital also affect domestic investment and production. For example, if higher foreign capital makes domestic capital more productive, then provisions of the Tax Cuts and Jobs Act that lower the cost of capital can result in higher domestic as well as foreign investment. Incorporating these effects for multinationals increases the response of domestic investment.

Second, capital accumulation takes time, and so does the process of adjustment to a tax change, due to the pace of managerial decision-making, procurement delays, and general time-to-build. Evaluating the 2017 tax legislation in summer 2024 thus necessarily requires some extrapolation from the short-run effects that we can observe already to the long-run accumulation of capital. Investment models bridge this difference by incorporating adjustment costs to investment or capital that determine the rate of convergence to the long run.

Third, corporate tax rate changes affect incentives for debt financing because of the deductibility of interest costs. With a lower rate, each dollar of deduction realizes smaller tax savings, reducing the tax incentive of debt-financed investment. This additional margin can mean that the effective increase in investment incentives is smaller than one might predict from the decline in corporate tax rates alone. A smaller effective increase in investment incentives lowers the responsiveness of investment.

Fourth, the canonical model has one type of capital, but in practice firms make decisions for many types of capital. National income accountants classify capital into the broad categories of structures, equipment, and intellectual property. Each type has its own user cost, which varies with the economic depreciation rate as well as due to tax provisions that only apply to some types of capital. For example, the “bonus depreciation” provisions apply to equipment, but not structures. In addition, different types of capital interact in production. Complementarity between equipment and structures means that incentivizing one can boost investment in the other. Likewise, complementarity between foreign and domestic capital can make domestic investment responsive to foreign tax incentives.

Fifth, and relatedly, intangible capital can affect the mapping between tax policy and investment. Intangible capital broadly defined includes intellectual property as well as factors not included in national income accounting such as brand equity and managerial capacity. Intangible capital can facilitate profit shifting: for example, a firm might hold intellectual property in a tax haven country allowing it to allocate profits to the tax haven, even if the actual production and sales happen elsewhere. If firms used this approach before the 2017 law to avoid corporate taxes, then reducing tax rates might have a smaller effect on domestic investment.

Finally, the corporate income tax only applies to C-corporations, and not to other sectors that accumulate capital. This general point was recognized as early as the canonical Harberger (1962) model of corporate tax incidence in an economy with a corporate and non-corporate (housing) sector. Lowering the corporate tax reallocates capital into the corporate sector from the non-corporate sector, which reduces the return to all capital owners in both sectors. Similar forces apply to the pass-through sector. When the 2017 tax law cut tax burdens by relatively more in the corporate sector, capital may have shifted from the pass-through sector to the corporate sector.

Quantifying the Business Tax Shock in the Tax Reform and Jobs Act

Quantifying the size of the 2017 tax change requires joint consideration of several provisions of the new law. We first describe seven main components, and then offer some estimates of their combined effect on marginal tax rates and the cost of capital. For additional details on corporate income tax components of the Tax Reform and Jobs Act of 2017, useful starting points are Auerbach (in this journal, 2018) and Gale et al. (2019).

First, the 2017 law changed the tax rate for C-corporations. The new law replaced a non-monotonic corporate income tax rate schedule culminating in a headline rate of 35 percent for the top income bracket with a single rate of 21 percent.

Second, owners of pass-through businesses received a rate cut due to the reduction in personal income tax rates, which ranged from 0-4 percentage points (as discussed in Jon Bakija's paper on individual taxation in this volume). In addition, Section 199A of the 2017 law provided a further 20 percent rate reduction for qualified pass-through income for low- and medium-income owners or for businesses engaged in certain activities delineated in the law. In particular, the rule excluded "specified service trades or businesses," with the goal being to prevent high-income service workers such as doctors and lawyers from receiving the lower tax rate (Goodman et al., 2019).

Third, across both C-corporation and pass-through corporate forms, firms could deduct 100 percent of their investment for some types of property for the first five years. This provision is referred to as "expensing" investment, because the total costs of an investment are treated like a current year expense, rather than spread over time as the investment depreciates. After five years, expensing was phased out at a rate of 20 percentage points per year.

Fourth, to encourage firms to locate intangible capital like intellectual property and brand names in the United States, rather than in a "tax haven" country with lower corporate tax rates, the 2017 law introduced a new deduction of 37.5 percent (falling to 21.875 percent in 2026) of a firm's Foreign Derived Intangible Income (FDII), defined as the export share of a firm's income in excess of 10 percent of its domestic tangible capital.

Fifth, to offset some of the cost of these provisions, the Tax Cuts and Jobs Act included base broadeners. The new law ended the ability of C-corporations to "carry back" losses to reduce income tax in previous years and limited to 80 percent of income the deduction for losses carried forward to offset corporate income in future years. It repealed the Domestic Production Activities Deduction, in which firms in certain industries (like manufacturing and construction) could claim a deduction based on domestically-produced income. It introduced a limit for interest deductions of 30 percent of economic income for firms with receipts above \$25 million. And it weakened incentives for research and development spending by stipulating that as of 2022 companies could no longer deduct their full costs of R&D immediately and instead must spread the deduction over five years.

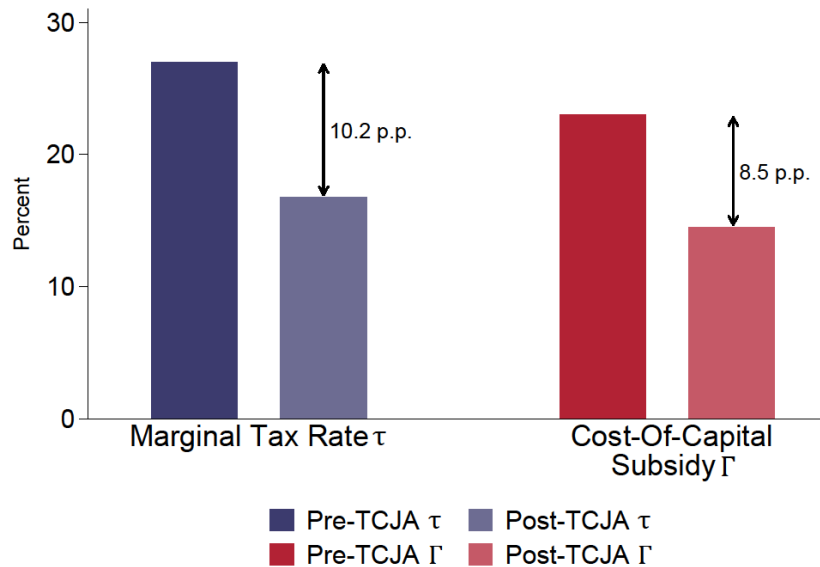
Sixth, the 2017 law eliminated the corporate alternative minimum tax, which involved an alternative set of calculations about corporate income, with its own rules and rates.

Finally, the Tax Cuts and Jobs Act also changed the rules for taxing the foreign source income of US firms. Although the changes that affect foreign firms and investors are discussed in more detail in the paper by Clausing in this symposium, we review them briefly here because they also may affect domestic investment activity. In the previous system, firms paid US taxes (in excess of credits claimed for foreign taxes paid) when they repatriated foreign income. The reform allows businesses to immediately deduct 100 percent of dividends paid by foreign subsidiaries. This change effectively makes the US corporate tax system “territorial”—that is, it taxes only corporate income earned in the United States—but with two exceptions. First, in recognition of the build-up of deferred dividends from past years at many multinationals, the Tax Cuts and Jobs Act included a “toll tax” of between 8 and 15.5 percent (with the higher rate applying to cash holding and the lower rate to other assets) on the existing stock of deferred dividends, which firms can pay over eight years. Second, to mitigate the incentive for firms to report all their profits in tax havens, the reform introduced a tax on Global Intangible Low Taxed Income (GILTI) of 10.5 percent (increasing to 13.125 percent in 2026). This tax applies to income earned abroad in excess of 10 percent of foreign tangible capital, with firms allowed to offset their GILTI tax by 80 percent of foreign taxes paid.

Analyzing the effect of these changes in tax rates requires distinguishing among statutory, average, and marginal tax rates. The *statutory tax rate* is the rate for the relevant bracket of the income tax schedule, the *average tax rate* is the share of income paid in taxes, and the *marginal tax rate* corresponds to the τ that governs marginal investment decisions, which is how much tax the firm has to pay if it earns another dollar of income. These rates differ under a non-flat tax schedule, if a firm has non-positive taxable income, or because of deductions or credits that change with the marginal dollar of income.

Chodorow-Reich et al. (2024) report changes in marginal rates for mid-size and large C-corporations resulting from changes to the corporate income tax rate schedule; the repeal of the corporate alternative minimum tax and the Domestic Production Activities Deduction; the limits on loss carrybacks and carryforwards; and rules on the taxation of Foreign Derived Intangible Income (FDII). To account for the dynamics introduced by carrybacks and carryforwards of losses, they simulate income paths and use of credits and deductions using firm-level tax return data from the US Treasury. They estimate marginal tax rates by perturbing the income paths by \$1,000 of additional corporate income in the current year and calculating the change in the present value of taxes. Chodorow-Reich et al. (2024) estimate the changes to the cost-of-capital subsidy using firm-specific information on investment types together with type-specific changes in the present value of depreciation allowances.

Figure 3: Average Effects of the TCJA on Marginal Tax Rates and Cost-of-Capital Subsidies



Source: Chodorow-Reich et al. (2024).

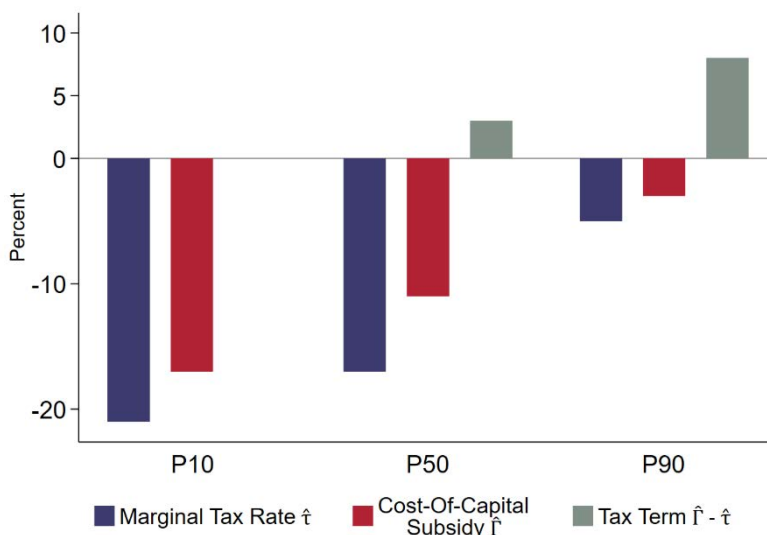
Note: This figure plots the average value of τ (the marginal tax rate) and Γ (the cost-of-capital subsidy) before and after the TCJA. The black bidirectional arrows indicate the change (in percentage points) in τ and Γ .

The left-hand bars in Figure 3 plot the estimates for the marginal effective corporate tax rate, which falls by around 10 percentage points—smaller than the 14 percentage-point statutory cut in the top corporate tax rate. The right-hand bars show the estimated change in the cost-of-capital subsidy Γ . For physical capital, this term depends primarily on the regime governing depreciation deductions. The average firm had a domestic cost-of-capital subsidy of 24 percent before the 2017 law, which fell by 8.5 percentage points. While the change from 50 percent “bonus depreciation” to full expensing increases Γ , the reduced marginal tax rate decreases the tax savings from each dollar of depreciation allowances.

Putting together these changes into a total tax wedge for tangible capital, Chodorow-Reich et al. (2024) find a decline in the composite tax term $(1-\Gamma)/(1-\tau)$ of about 4.5 percentage points for the average C-corporation when weighted by assets. Barro and Furman (2018) estimate larger changes in the tax wedges for equipment and structures of around 10 percentage points for each. The differences are due to differences in methodology: Chodorow-Reich et al. use marginal effective tax rates, instead of statutory rates, and use a baseline of 50 percent bonus depreciation. But even with the smaller estimates, the tax reform represented the largest shock to the domestic tax term since the 1980s.

Figure 4 shows that the changes in the marginal rate, effective cost-of-capital subsidy, and composite tax term varied across firms. For the marginal rate, 10% of firms experienced a decline in the marginal “keep rate” $1-\tau$ of more than 20%, the median firm experienced a decline of 17%, and 10% of firms experienced declines of less than 5%. This heterogeneity reflects different use of credits and deductions and propensity to have negative taxable income. Dobridge et al. (2023) complement this analysis by reporting changes in average tax rates across the size distribution of C-corporations. They point out that many smaller C-corporations experienced increases in their average tax rates, because for these firms, the 2017 law replaced a tax schedule with a 15 percent rate on the first \$50,000 of income with the flat 21 percent rate.

Figure 4: Heterogeneous Effects of the TCJA



Source: Chodorow-Reich et al. (2024).

Note: This figure plots the change in the marginal rate ($\hat{\tau}$), effective cost-of-capital subsidy ($\hat{\Gamma}$), and composite tax term ($\hat{\Gamma} - \hat{\tau}$) at the 10th, 50th, and 90th percentiles. The 10th, 50th, and 90th percentiles refer to the average change among firms in the neighborhood around the 10th, 50th, and 90th percentiles. We report these local averages (rather than the percentile values directly) to comply with IRS disclosure rules.

Firms also display substantial heterogeneity in the change in Γ , due to differences in the types and share of investment previously eligible for bonus depreciation. The new deduction for Foreign Derived Intangible Income also reduces the effective Γ for some firms; because the deduction only applies to income in excess of 10 percent of domestic tangible capital, an additional dollar of capital mechanically reduces this deduction. Overall, the percent change in the composite tax term is zero for the bottom decile of firms, 3% for the median firm, and above 8% for the top decile of firms.

Table 1 shows the average tax term change across industries. In general, industries with higher domestic shares of activity and more long-lived investment saw larger changes in the tax term. Other provisions of the 2017 law that led to substantial differences across industries include the altered tax treatment of research and development and of pass-through firms.

The cost-of-capital changes discussed so far pertain to physical investment in equipment and structures. Regarding research and development spending, the effective subsidy changed through two main channels. First, the switch from immediate to a five-year period for deducting R&D expenses increases the effective cost-of-capital of R&D in the long run, although over 2018-2021 it may have incentivized firms to “pull forward” R&D expenditure if they anticipated the less favorable treatment to come. Second, both the change in the corporate rate and expensing affect the generosity of the existing Research and Experimentation (R&E) tax credit. Because firms cannot simultaneously expense R&D for tax purposes and also claim the full R&E credit, they typically reduce the credit amount by the statutory corporate rate. However, with R&D expensing now spread over five years, this limit binds much less tightly, increasing the effective R&E credit rate. Barro and Furman (2018) calculate that on net the user cost of R&D increases by 9 percent as a result.

Regarding tax treatment of pass-throughs, the key question is whether certain provisions will be allowed to expire as scheduled. In their “law-as-written” scenario, Barro and Furman (2018) estimate that the Tax Cuts and Jobs Act increases their user cost of capital by 1.3 percent. This increase comes mostly from an increase in the marginal tax rate on individual income, from the elimination of the Domestic Production Activities Deduction, and from a change in how the tax brackets creep up with inflation. However, in their “provisions permanent” scenario, which keeps in place the relevant provisions that are scheduled to expire, they estimate that pass-through user costs of capital fall by 5.1 percent from lower marginal income tax rates and the 20 percent deduction for some pass-through income. This change is approximately half the size of their estimate for C-corporations.

Signatures in the Macroeconomic Data

We now turn to the effects of the Tax Cuts and Jobs Act of 2017 on investment, wages, output, and tax revenue. To set the stage, Figure 5 plots the time paths of corporate investment (C-corporations and S-corporations) and tax revenue (C-corporation only). Each line shows a series in constant prices (using own deflators for investment and the GDP price index for income tax revenue) and indexed to equal 100 in 2016, the last full year before the passage of the law.¹

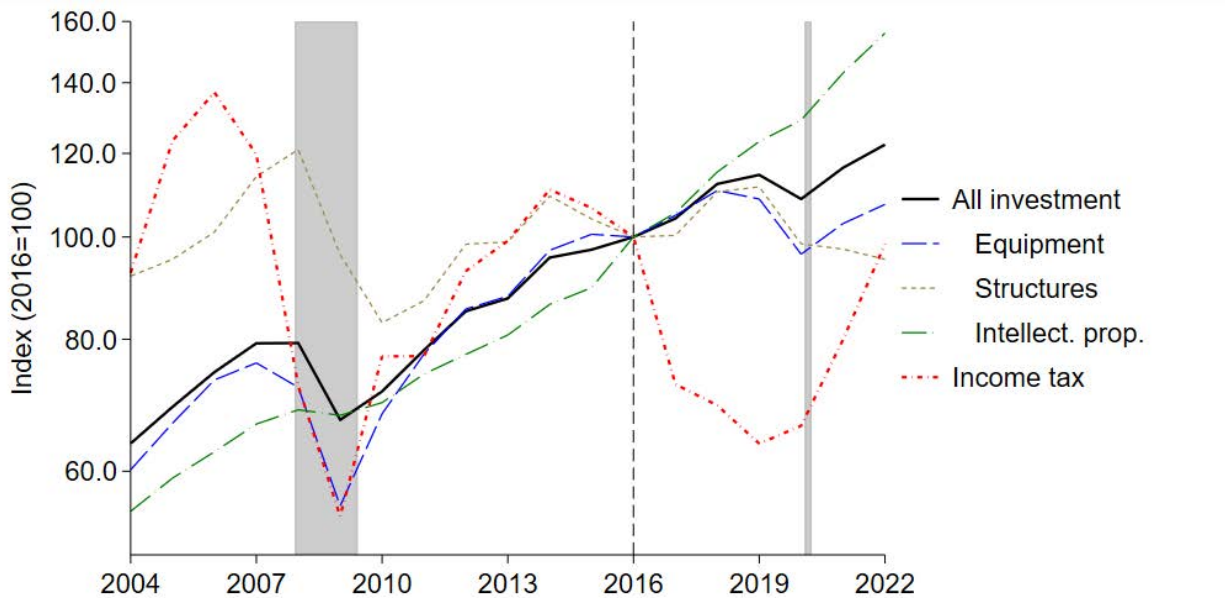
The solid black line shows the trajectory of total corporate investment, which rose after 2017 at a broadly similar pace to the years prior. The series also illustrates that corporate investment is highly volatile and cyclical, which makes it difficult to discern the impact of the 2017 law on investment from the time series alone.

The dashed blue, dotted gold, and dash-dot green lines show, respectively, the trajectories of the major components of investment: equipment, structures, and intellectual property investment. The fastest growth both before and after 2017 occurred within intellectual property, which received the smallest boost from the tax change, and shows no clear break in trend. Both equipment (starting in 2017) and structures (starting in 2018) appear to have higher investment

¹ While the law was passed in December 2017, certain provisions including bonus depreciation were made retroactive to October.

after the Tax Cuts and Jobs Act than the trend lines from the years immediately preceding would have predicted. In fact, averaged over 2017:Q4-2019:Q4, non-residential equipment and structures investment (including non-corporate) exceeds the out-of-sample forecast from a univariate regression on four quarterly lags by 5.2p.p. As another comparison, the change in total non-residential investment from 2017:Q4 to 2019:Q4 of 8.9% exceeds the pre-TCJA July 2017 "Tealbook" forecast of the staff of the Federal Reserve by 4.6 p.p. However, the volatility of these components cautions against strong conclusions based on the time series evidence alone.

Figure 5:
Corporate Income Tax Revenue and Investment Around the Tax Cuts and Jobs Act of 2017



Source: The series for investment and its components come from Bureau of Economic Analysis Fixed Asset Accounts (<https://apps.bea.gov/national/FixedAssets/Release/TXT/FixedAssets.txt>) table 4.8 (lines 17–20) and include investment of both C- and S-corporations. The series for income tax comes from BEA National Income and Products Accounts (<https://apps.bea.gov/national/Release/txt/NipaDataA.txt>) Table 3.2 (line 8) and includes only corporate income taxes and hence omits taxes paid by owners of S-corporations.

Note: The BEA series assigns taxes to the year in which the income occurred and hence reassigns the Section 965 “toll tax” payments to previous years. Each line shows a series in constant prices (using own deflators for investment and the GDP price index for income tax revenue) and indexed to equal 100 in 2016.

The dash-dot red line shows the path of corporate tax revenue. Despite a strong macroeconomy, real corporate revenue fell in 2019 by 36 percent relative to 2016. Corporate tax revenue then increased substantially in 2021 and 2022, coinciding with high corporate profits during that time.

Of course, these aggregate series reflect not only the effects of the Tax Cuts and Jobs Act on investment and revenue, but also the effects of other shocks from spending policy, trade, monetary policy, the COVID pandemic, and so on. The presence of other macroeconomic shocks further complicates inference of the causal effect of the 2017 law on investment or revenue from the aggregate time series. We therefore turn to two alternative approaches: one based on past

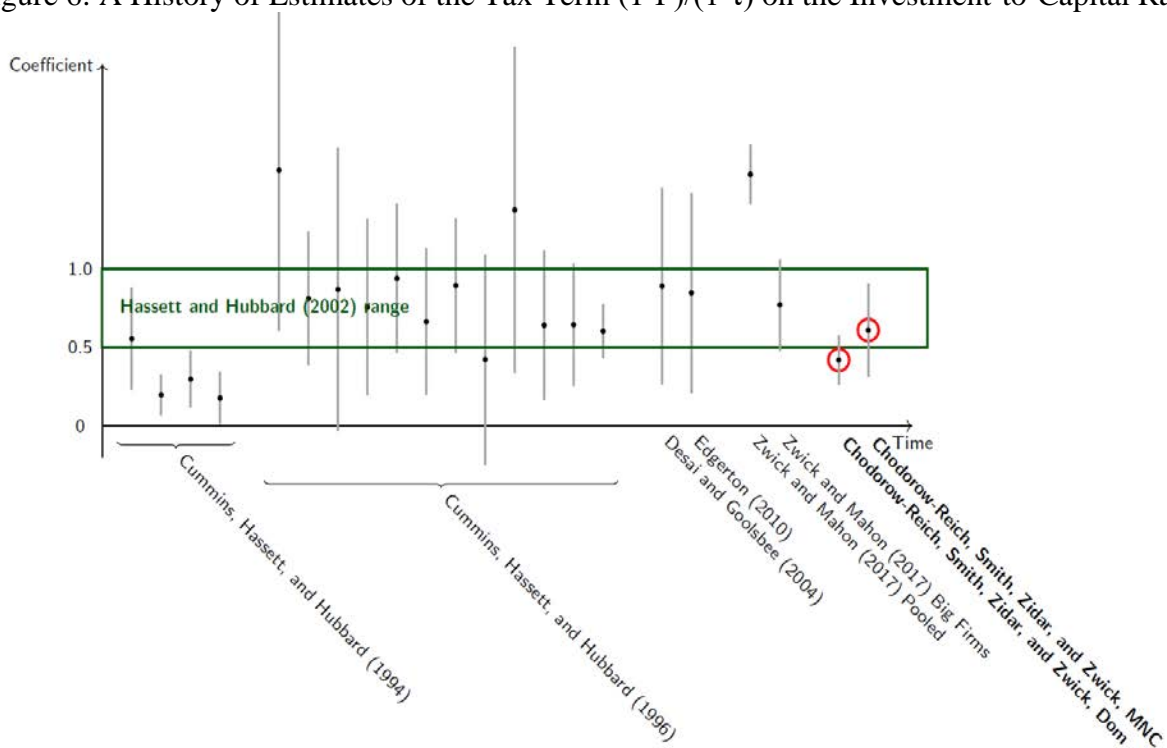
estimates or model calibrations, and the other comparing firms facing different tax shocks within the same post-law-change macroeconomic environment.

Estimates of the Effect of Tax Changes on Domestic Investment Prior to the Law’s Passage

One approach to estimating the investment effects of the Tax Cuts and Jobs Act is to multiply the changes to the user cost of capital from the 2017 law by the relevant elasticities from historical data or from a calibrated model.

Earlier research has used previous tax reforms to estimate the response of investment to changes in the tax wedge. These studies exploit variation across firms and industries in exposure to the tax reforms: for example, how the tax term $(1-\Gamma)/(1-\tau)$ varies according to differences in the types of capital on which these firms rely. Figure 6 plots some estimates of this statistic from this literature, ordered by publication date. Cummins, Hassett, and Hubbard (1994) pioneered this approach using US tax reforms from the 1960s through the 1980s. They found coefficients of the investment-to-capital ratio with respect to the tax term in the 0 to 0.5 range. Cummins, Hassett, and Hubbard (1996) present estimates in the 0.5 to 1.5 range using a series of international tax reforms. Hassett and Hubbard (2002) survey the literature and offer a “consensus” range of 0.5 to 1. Desai and Goolsbee (2004) and Edgerton (2010) find estimates slightly below 1 using US tax reforms through the 1990s. Zwick and Mahon (2017) focus on bonus depreciation reforms in the 2000s and find similar estimates for big firms. They find larger effects in a sample that includes many smaller private firms, which are more responsive and likely to be financially constrained.

Figure 6: A History of Estimates of the Tax Term $(1-\Gamma)/(1-\tau)$ on the Investment-to-Capital Ratio



Source: Authors' calculations.

Note: This figure plots estimates of the effect of changes of the tax term on the investment-to-capital ratio. Confidence intervals are provided in gray. The estimates are ordered along the x-axis by publication date. The green box indicates the “consensus” range proposed by Hassett and Hubbard (2002).

CEA (2018) analyzes the likely effects of the new law by appealing to these historical estimates. Specifically, CEA (2018) refers to the Hassett and Hubbard (2002) range as indicating an “estimated user-cost elasticity of investment at about -1.0, consistent with the neoclassical benchmark. These estimates imply that a tax change that lowers the user cost of capital by 10 percent would raise demand for capital by up to 10 percent.”² However, the coefficients reported in Figure 6 all correspond to short-run, cross-firm or cross-industry responses of investment to tax changes, which may differ from the long-run, general equilibrium changes because of short-run adjustment costs and the fixed supply of factors such as labor in the aggregate. The calculation in CEA (2018) does not account for these differences.

Imposing the first order condition of a cost-minimizing firm relating output elasticities to cost shares provides an alternative means to calibrate the effects of user cost changes on capital accumulation. Barro and Furman (2018) perform this calculation averaging over five different types of capital-- equipment, structures, residential rental property, R&D intellectual property, and other forms of intellectual property—and arrive at an elasticity of -1.6 for the capital-to-labor ratio with respect to the user cost, and of -0.6 for output per worker (see also Auerbach 2018).³

Starting from either historical reforms or a calibrated model, one needs measures of the effect of how the Tax Cuts and Jobs Act affected the user cost to predict the likely effect of the law. Applying a user cost elasticity of -1 to a user cost change of -10 percentage points, CEA (2018) finds a predicted increase of 10% of the capital stock. Applying a user cost elasticity of -1.6 to a similar-sized user cost change, Barro and Furman (2018) finds a predicted increase of 14% of corporate equipment capital and 16% of corporate structures capital in a scenario with no phase-out of any provisions. Replacing the 10 percentage point user cost change with the 4 percentage point change in Chodorow-Reich et al. (2024) scales down the predicted changes in the capital stock commensurately.

Furthermore, these predictions apply to different sectors of the economy. CEA (2018) predicted an increase of the total capital stock, rather than just the capital stock in the corporate

² The “neoclassical benchmark” refers to a long-run unitary user cost elasticity of the capital-output ratio under a Cobb-Douglas production function (see e.g. Caballero, 1999). This is different from the elasticity of capital alone, which under a Cobb-Douglas production function has an elasticity with respect to the user cost of larger than one (see the next footnote).

³ To understand the Barro and Furman (2018) elasticity, consider a production function $Y = K^{\alpha_K} L^{\alpha_L}$. In general equilibrium with fixed labor (normalized to 1), the first order condition for the marginal product of capital is $\alpha_K K^{\alpha_K - 1} = \text{user cost}$, giving a user cost elasticity of the capital-labor ratio of $-1/(1 - \alpha_K)$. Barro and Furman set $\alpha_K = 0.38$, giving an elasticity of roughly 1.6.

sector.⁴ The total capital stock includes capital in the non-corporate sector, which experienced a smaller shock and also may respond differently, especially in general equilibrium.

Ideally, one would apply different elasticities for the pass-through sector because these firms tend to operate in different industries and at different scales than traditional C-corporations. The literature is relatively less developed here. Giroud and Rauh (2019) use state-level tax changes to study establishment and employment responses for C- and S-corporations that operate in multiple states. They find smaller elasticities for pass-throughs than C-corporations. DeBacker et al. (2018, 2019) study how pass-through activity responds to a 2012 Kansas tax cut and find limited evidence of real responses.

Short-Run and Partial Equilibrium Effects on Corporate Activity

As data have become available since 2017, we can study the short-run effects of the Tax Cuts and Jobs Act on various corporate outcomes more directly. Recent studies exploit cross-sectional research designs to isolate the impact of the reform from other simultaneous non-tax shocks. We focus on studies using administrative tax data to measure exposure to the reform and firm-level outcomes.⁵ Of course, these studies generally only have a few years of data since 2017 and before the effects of the pandemic in 2020, so their reduced-form empirical results measure the short-run response to the reform.⁶

Research Designs

One approach to estimating the effect of the change in the corporate rate is to compare the outcomes of C-corporations, which benefited from the reduction in the top bracket corporate rate from 35% to 21%, to S-corporations, which experienced a smaller rate cut. Kennedy, Dobridge, Landefeld, and Mortenson (2023) perform this analysis. This approach has the advantage of holding fixed changes that affect both types of corporations, such as expensing and many international provisions. It has the limitation that the largest US companies are predominantly C-corporations, for which S-corporation comparison firms cannot be used. An alternative “exposure approach” compares C-corporations with bigger and smaller tax shocks. Chodorow-Reich et al. (2024) implement this design by measuring the shocks from different tax provisions separately, including the novel international provisions that primarily affect the largest firms. To study the effect of lowering the interest deduction cap, Goodman, Isen, Richmond, and Smith (2024) compare outcomes at small firms (which were not affected by the change in the cap) and large firms and across firms with high and low interest expenses. In the case of pass-through firms, Goodman, Lim, Sacerdote, and Whitten (2021) exploit variation

⁴ Barro and Furman (2018) estimate that the corporate sector represents 39% of value added, the pass-through sector represents 36%, and the nonbusiness sector (government, households, and non-profits) represents the remaining 25%.

⁵ Chodorow-Reich et al. (2024) show that investment as reported on corporate tax returns closely tracks corporate investment in the Bureau of Economic Analysis Fixed Asset Accounts.

⁶ See the TJCA Effects Tracker by Jeff Hoopes for a more comprehensive catalogue of studies <https://tax.kenaninstitute.unc.edu/what-do-we-know-about-the-effects-of-the-tax-cuts-and-jobs-act/>. These include Garcia-Bernardo, Janský, and Zucman (2022) on profit shifting; Hanlon, Hoopes, and Slemrod (2019) on corporate earnings statements; and many other studies.

across industries in exposure to the pass-through tax cut, which excluded some firms from benefiting. One limitation of the paper, which is the best evidence on the issue to date, is that some of the outcomes have pre-trends, which make inference more difficult. That said, there is no evidence of an investment response within this sample.

C-Corporation Investment

Differing methods of estimating the effect of the Tax Cuts and Jobs Act on investment reach similar results, within the range of previous studies but at the lower end. Kennedy, Dobridge, Landefeld, and Mortenson (2023) estimate a semi-elasticity of the investment-to-capital ratio of 0.44 with respect to the net-of-corporate-tax rate. Chodorow-Reich et al. (2024) also estimate the effects of the log change in the tax term on the investment-to-capital ratio and find 0.52. These estimates of 0.44 and 0.52 are in the range, but on the lower end of earlier estimates from the literature that we depict in Figure 6.

In partial equilibrium results, Chodorow-Reich et al. (2024) report that domestic investment of firms with the mean tax change increased 20 percent versus a no-change baseline. An intriguing result in their study is that domestic investment responds to the change in the taxation of foreign income, which supports the idea that foreign and domestic capital act as complements in multinational production (Desai, Foley, and Hines 2009).

While Chodorow-Reich et al. (2024) do not specify the tax incentives for research and development directly, they do ask how it responds to changes in marginal tax rates and the cost-of-capital firms with big and small changes to those tax terms. They find short-run impacts on R&D expenses of 14 percent for multinational firms experiencing the mean tax shock relative to firms with no tax change. For domestic firms, they find a 4.2 percent increase.

C-Corporation Wages

Kennedy, Dobridge, Landefeld, and Mortenson (2023) estimate that wages increase by around \$700 more (around 1 percent of baseline wages) for C-corporations than S-corporations because of the tax change. They also find that most of these wage gains occur at the top of the wage distribution.

Chodorow-Reich et al. (2024) estimate short-run impacts on labor compensation, which is the product of earnings per worker and the number of workers. They do not distinguish between wage gains and employment increases due to the substantial measurement difficulties involved with being able to identify firm-worker links for C-corporations, especially those with complex structures and those that use payroll processors that can make it hard to isolate earnings and employment for each firm. They estimate labor compensation increases around 2 percent for domestic firms experiencing the mean tax change relative to firms with no change. Their estimates for multinationals are not statistically significant. The broad similarity between the estimate of worker-level gains and in the total compensation response in these two studies bolsters their credibility. Yet, it bears repeating that these are relative wage responses across firms and do not directly answer the question of how aggregate wages changed; in the extreme case of a frictionless, competitive labor market in which all firms pay the same wage, a cross-firm research design would never uncover any effect on wages.

Pass-Throughs

Goodman, Lim, Sacerdote, and Whitten (2021) find little evidence that the pass-through business tax cuts cause real economic responses in investment, employment, and wages. Historical estimates of weaker elasticities to tax shocks for pass-throughs support this conclusion. When combined with the concentration of pass-through income at the top of the income distribution (Smith et al. 2019), the pass-through firm provisions probably delivered quite concentrated gains at the top of the income distribution.

Stock Prices

Evidence on how tax changes affect stock prices will depend on investor time horizons and how well they understood the reform during the debate. In addition, the response to the tax rate change mixes forward- and backward-looking effects, because lower tax rates benefit both new capital and the return on capital already in place.

Public companies that faced higher effective tax rates prior to the Tax Cuts and Jobs Act and thus were more likely to benefit from a broad rate reduction have large cumulative stock price gains in the wake of the 2016 election and during the next year of tax policy debate. For example, Wagner, Zeckhauser, and Ziegler (2018a,b) find that cumulative stock prices increase around 0.1 percent per percentage point reduction in the effective corporate tax rate, and the aggregate stock market tended to outperform on days when high-taxed firms outperformed. Other studies have generally found consistent results, with some disagreement based on methodology (for example, Blanchard et al. 2018; Gaertner, Hoopes, and Williams 2020; but also compare Borochin et al. 2021).

Using an alternative approach, Chodorow-Reich et al. (2024) combines their measurement of tax shocks and their estimated investment response to these shocks. They compute predicted investment effects for each firm and ask whether firms with larger investment effects due to the Tax Cuts and Jobs Act also experienced larger stock price growth during the reform debate. They find an excess cumulative return of high-exposure versus low-exposure firms of 8 to 12 percent.

Long-run and General Equilibrium Effects on Corporate Activity and Tax Revenues

The difference between firm-level and economy-wide responses arises because variables that an individual firm may treat as exogenous in its decision process, such as the wage, interest rate, or aggregate income, are determined endogenously in general equilibrium. The difference between the short-run and long-run response arises because of adjustment costs that spread out the response over time and because some of the law's provisions change over time.

Effects on Investment

A first straightforward approach to aggregation of investment across firms involves considering aggregate supply elasticities of capital and labor, and then iterating on firm-level factor demand as wages and the cost of capital change. Chodorow-Reich et al. (2024) implement such an approach for an inelastic aggregate labor supply, but assuming no crowd-out in the

markets for capital goods or the interest rate.⁷ They also calibrate adjustment costs to match standard dynamics found in the literature and assume all the Tax Cuts and Jobs Act provisions in place for 2018 become permanent. They find that the general equilibrium crowding out from higher wages reduces the long-run increase in domestic corporate capital from 13 percent to 7 percent.⁸ In the short run, domestic investment of C-corporations rises by roughly 12 percent.

With a similar model and their user cost elasticities (based on pre-2017 evidence), Barro and Furman (2018) estimate long-run general equilibrium outcomes. They predict an increase in C-corporation capital per worker of 6.7 percent under the law-as-written and 12.7 percent if all provisions become permanent. Their calibration of a larger user cost change and larger capital elasticity in the production function and their incorporation of non-C-corporation provisions explains much of the difference with Chodorow-Reich et al. (2024). They estimate the pass-through law as written would reduce output per worker in the pass-through sector by 0.8 percent (whereas the analogous C-corporation provisions would raise output per worker by 8.1 percent). They find a wage response of 0.9 percent in the law as written scenario, and 3.1 percent in the provisions permanent scenario.

A second approach to incorporating general equilibrium price and income changes is to compare US firms to non-US counterparts. In an exercise with US and Canadian publicly-traded firms, Crawford and Markorian (2024) find higher investment growth at US firms after the 2017 law, especially those firms more likely to benefit from bonus depreciation or with international operations. Chodorow-Reich et al. (2024) synthetically match publicly-traded US firms to foreign-headquartered firms. They find global investment increases among US firms by about 17 percent in years immediately after the reform, and that some of the most important industries contributing to those gains were utilities and manufacturing. The finding of a global investment response higher than the domestic response concords with the cross-firm evidence in Chodorow-Reich et al. (2024) of foreign investment responding positively to incentives in the new international regime.

A third approach involves comparing actual investment to a plausible baseline forecast if the Tax Cuts and Jobs Act had not become law. Furno (2023) develops such a baseline by

⁷ Allowing for crowd-out in the market for capital goods or for higher deficits to raise interest rates would reduce the growth and investment effects. While Goolsbee (1998) found that the price of capital goods responded strongly to tax incentives for investment, his evidence was sharply disputed by House, Mocanu, and Shapiro (2022). Regarding interest rates, below we report an average increase in the deficit due to the TCJA's business provisions of roughly 0.6% of GDP per year over the first decade. Although the causal relationship between interest rates and deficits is difficult to precisely determine, applying a conventional parameterization of 25 basis points increase in the interest rate per 1 percentage point increase in the deficit/GDP ratio (Laubach, 2009) would imply interest rates increase by 10-20 basis points. In the formula for the long-run capital stock, the sum of the interest rate r and the depreciation rate δ multiply the tax term. Taking a 6% interest rate and a 10% depreciation rate, a 15 basis point increase in the interest rate increases this sum by 0.94%, potentially offsetting perhaps one-fifth of the 4.4% reduction in the tax term.

⁸ As discussed in footnote 5, in a model of domestic-only firms with a capital elasticity in the revenue function of α_K , the general equilibrium long-run elasticity of capital to the user cost is $-1/(1-\alpha_K)$. Given a labor share of 0.65, Chodorow-Reich et al. (2024) recover a value of α_K of roughly 0.25 from their cross-firm evidence. Multiplying the user cost decline of roughly 4.4p.p. by $1/(1-0.25)$ implies an increase of 5.8%; the difference between this calculation and the 7% reported in the text comes from the response to the changes to taxation of foreign income and the inclusion of the non-corporate sector.

aggregating firm-level forecasts of key variables made by stock market analysts prior to the law's passage. While actual pre-tax income in 2018 and 2019 closely tracks analysts' forecasts, investment (as well as payouts to shareholders) sharply exceeded even the upper range of forecasts. Averaged over 2018-2019, global investment rises by about 14 percent above the forecast path.

These distinct approaches to arriving at economy-wide outcomes each have advantages and pitfalls. Imposing general equilibrium market clearing in a fully specified model ensures consistency with the cross-firm evidence and allows for extrapolation to the long run. However, it necessarily misses any unmodeled forces. For example, the short-run increase in aggregate demand from higher investment might increase employment and output, while in the medium and long run higher deficits might increase interest rates and dampen the aggregate investment response. Comparisons of US firms to foreign firms or to pre-2017 forecasts offer a more direct approach that includes all domestic general equilibrium forces, but they cannot separately identify the effects of the Tax Cuts and Jobs Act from other concurrent macroeconomic shocks. They also make it difficult to isolate the role of independent provisions of the reform. But taken together, the finding of a positive corporate investment response in the broad range of 8 to 14 percent across these methodological approaches reinforces the conclusion of a positive macroeconomic investment response to the Tax Cuts and Jobs Act.⁹

Since aggregate investment in Figure 5 stayed on its pre-reform trend, these estimates suggest that investment would have declined in the absence of the TCJA. This decline is consistent with evidence in Kennedy et al. (2024) that investment rates of S-corporations were substantially lower in the post-reform period. Specifically, they show net investment rates decline from around 7.5% to around 3.25% between 2015-2016 to 2018-2019. Some of this decline could be due to re-allocation to C-corporations, which enjoyed a larger tax cut, from pass-throughs, which didn't get as large of a rate reduction. Other macroeconomic forces, including rising interest rates, shocks to oil prices, and trade disruptions, may also have contributed to an overall decline in investment in the absence of the reform.

Effects on GDP

Moving from the response of investment to an implied change in GDP requires determining the capital response by sector, the output elasticity of capital, and sectoral shares in GDP. As noted already, Chodorow-Reich et al. (2024) find that the changes to the effective corporate rate, FDII (to tax Foreign Derived Intangible Income), GILTI (to tax Global Intangible Low-Taxed Income), and full expensing for C-corporations together cause a long-run increase in domestic corporate capital of 7 percent. Assuming a similar depreciation profile and investment elasticity of non-corporate business as domestic corporate business, the long-run effect on domestic business capital in their framework becomes 4.6 percent.¹⁰ Because Goodman, Isen,

⁹ Note that these effects apply to different subsets of investment, and do not imply that total investment economy-wide increased by 10 to 15 percent. For example, the synthetic control approach examines investment of a subset of public companies for which there are good matches. This sample is smaller than total U.S. investment.

¹⁰ Chodorow-Reich et al. (2024) do not estimate the impact of the reform on domestic investment by foreign multinationals operating in the United States. Their estimate effectively assumes these firms face the same shocks and generate the same response as the US C-corporation sample.

Richmond, and Smith (2024) find no effect of the interest deduction limitation on investment in their study of pass-through firms, this 4.6 percent increase represents the total response to the business provisions of the Tax Cuts and Jobs Act.

The corresponding increase in business value-added is smaller, because aggregate labor is inelastic and because of decreasing returns to scale. Accounting for these effects, the long-run increase in business value-added is 1.2 percent. Finally, since the business sector is about three-quarters of GDP, this magnitude implies a long-run increase in GDP of roughly 0.9 percent. Most of this increase occurs within the first 10 years, implying an increase in the growth rate of GDP of roughly 0.1 percentage points per year over that horizon.

A long-run increase in GDP of, say, 1 percent implies an increase in wages of roughly the same magnitude. Evaluated at the 2017 average compensation level of \$77,000 per employee, this effect would imply an increase in labor income of less than \$1,000 per employee, far smaller than the prediction of \$4,000 to \$9,000 in wage gains predicted by the Council of Economic Advisers (2017). This conclusion echoes the prediction in Furman (2017), who noted that the Council of Economic Advisers forecast would require higher aggregate wage income of “between 275 percent to 550 percent of the total cost of the \$200 billion (per year) corporate tax cut—implying a supply effect that’s more than a little far-fetched.”

Effects on Tax Revenue

Both corporate and individual income tax revenue changed because of the Tax Cuts and Jobs Act. The change to corporate income tax revenue reflects both the mechanical changes to the tax code---holding fixed corporate capital and profits---and the dynamic response of corporate capital and profits to the reform. The Chodorow-Reich et al. (2024) general equilibrium model captures both components and finds an immediate reduction in corporate revenue of more than 40 percent in response to the corporate tax changes. This large decline mirrors the decline in actual corporate revenue of 35 percent shown in Figure 5. Over time, the dynamic response of the capital stock and corporate income offsets some of this decline, but even 10 years after the reform, the corporate revenue reduction remains 41 percent (recall that this paper also assumes that the depreciation provisions remain permanent).¹¹

The relatively muted dynamic feedback response of corporate tax revenue occurs for two reasons. First, the scale of the investment response—positive, but not enormous--precludes very large changes to corporate profits. Second, the shift to expensing of investment means that the higher investment required to build and maintain a higher capital stock also directly reduces taxable corporate income.

¹¹ A full accounting of the sharp uptick in corporate tax revenue in the data in 2021 and 2022, as shown in Figure 5, goes beyond the scope of this article. Overall, pre-tax domestic corporate profits relative to GDP unexpectedly increased during this period; Congressional Budget Office (2018) forecast that the ratio of corporate profits to GDP would fall by 1.25 percentage points from 2018 to 2022, while in fact this ratio rose by 1.70 percentage points. An unexpected one-third increase in the profit share could explain the uptick in tax revenue. Because the 2018 CBO forecast came after the passage of Tax Cuts and Jobs Act, it seems plausible the increase in the profit share occurred as the result of other factors, perhaps related to the pandemic. Another potential explanation is an inbound profit-shifting response to the reform and subsequent changes in other countries’ regimes.

The changes to individual income tax revenue related to taxation of business income reflect three main forces: (i) higher labor income from wage growth, (ii) payout taxes on higher distributions from C-corporations, and (iii) payout taxes on profits of S-corporations. The Chodorow-Reich et al. (2024) model incorporates the responses along all three margins to the corporate tax changes and finds that they offset 1.5 percent of the corporate revenue loss in the first year and 6.3 percent by year 10 after the reform. This modest offset mostly occurs through personal rather than corporate income tax revenue.

Combining the output and revenue responses gives rise to a tax multiplier. The ratio of the annual average change in output to the annual average change in revenue over the first ten years provides one natural summary measure. In the Chodorow-Reich et al. (2024) model, average GDP over the first ten years is 0.44 percent higher due to the corporate provisions, while the ten-year revenue decline is 39.6 percent of pre-TCJA corporate revenue, or about 0.63 percent of GDP per year. Taking the ratio gives a ten-year average multiplier of roughly two-thirds.

Evaluating the Business Income Provisions One at a Time

Inspired by Auerbach (2018, Table 1) in this journal, who lists five key parts of the Tax Cuts and Jobs Act and their predicted economic effects, Table 2 highlights the estimated effects of each provision.

1) Reduced business tax rates. Kennedy, Dobridge, Landefeld, and Mortenson (2023) show how the distribution of average income tax rates changes for both C-corporations and S-corporations from 2016 to 2019. A little under 40 percent of C-corporations face a near zero rate (due to tax losses from a range of factors such as high costs or expensing large investments), and most other firms face tax rates near the top rate, which fell by 14 percentage points. For S-corporations, they show similarly that there is a range of income tax rates but the modal rate is the top tax rate. Across the distribution, they estimate that average tax rates fall by around 5 percentage points (or by 20 percent relative to the 25 percent pre-reform baseline) more than they do for S-corporations. Based on this larger reduction in corporate tax rates for C-corporations than S-corporations, they estimate that investment in C-corporations increases by 2.9 percent relative to S-corporations, while tax revenue declines.

Chodorow-Reich et al. (2024) isolate the effect of changes in the marginal effective tax rate τ , which falls by about 10 percentage points (or nearly 40 percent relative to the pre-reform baseline of 27 percent for the average firm). They find an increase in total capital accumulation of 3.4 percent after ten years from the rate cuts alone, around half the 5.9 percent increase when accounting for all the provisions collectively. Tax revenue declines by around one-third due to the rate cuts alone. Cutting the tax rate is the most expensive provision in terms of cost per unit of capital accumulation.

2) Expensing. By holding tax rates constant at their pre-reform value, Chodorow-Reich et al. (2024) model the effect of expensing alone. This exercise results in a domestic cost of capital

subsidy Γ that increases, rather than decreases when all of the TCJA provisions are included. Expensing increases investment, resulting in 1.7 percent more capital after ten years. Tax revenue decreases by 12.4 percent due to expensing. Over ten years, expensing delivers half the capital accumulation for one-third of the cost of the rate cut.

3) *Limiting interest deductions.* To estimate investment effects, Goodman, Isen, Richmond, and Smith (2024) compare two groups of high-interest firms: big firms and small firms that are exempt from the interest limitations. They find no effect on investment and can rule out investment changes exceeding 5 percent with more than 95 percent confidence. They also document that the interest limitation raises tax revenue.

4) *Global Intangible Low-Taxed Income.* The GILTI provision applies a 10.5 percent tax that applies to income exceeding 10 percent of foreign tangible capital. Since tangible income is calculated as 10 percent of tangible capital, increasing foreign tangible capital shrinks the tax base for GILTI. These incentives for foreign capital accumulation can boost domestic investment when foreign and domestic capital are complements. Chodorow-Reich et al. (2024) estimate that GILTI modestly boosts domestic capital accumulation by 0.9 percent over ten years, while also raising revenue.

5) *Foreign Derived Intangible Income.* The FDII provision subsidizes exports by allowing firms to deduct their export share of domestic income in excess of 10 percent of domestic tangible capital. This provision lowers the tax rate, but also increases the cost of capital (because having more tangible capital shrinks the tax base for FDII) in a manner that depends on each firm's export share, and so its overall effect on investment is ambiguous. Krull and Wu (2023) find suggestive evidence that the FDII provisions increased investment, but caution that this result is "sensitive to model specification." In terms of tax revenue, the Joint Committee on Taxation (2017) estimated that it would reduce tax revenue.

Finally, another provision that Auerbach (2018) highlights is a minimum tax on domestic earnings referred to as the base erosion and anti-abuse tax (BEAT). This provision imposes a tax on payments from US firms to foreign affiliates above 3 percent of total deductions. Auerbach concludes that BEAT likely reduces investment and raises tax revenue. Scorekeepers also estimate that BEAT would raise tax revenue. Research studies on the impact of BEAT remain to be written.

The Policy Path Forward

To reduce the budgetary cost of the bill as projected into the future, the Tax Cuts and Jobs Act legislated that many of its provisions would expire. While the cut in the corporate tax rate from 35 percent to 21 percent was made permanent, expensing started phasing down in 2023 by 20 percentage points each year. Beginning in 2026, the 20 percent deduction for qualified business income in Section 199A will expire. Expenses for research and development will start receiving less favorable tax treatment as of 2022. Instead of being able to be immediately deducted, they must be amortized over five years.

The overall fiscal picture of the US government looks worse than it did during the 2017 tax debate. Extending all or most of the provisions in the Tax Cuts and Jobs Act and letting the rate cut remain will be costly relative to the growth effects these tax cuts buy. In addition, the TCJA was passed during a period of exceptionally low interest rates, a regime from which the US economy appears to have since transitioned. The interest rate environment affects tax policy in several ways (Auerbach and Gale 2022). Deficit-financed tax cuts will crowd out investment more strongly when the Federal Reserve faces a sharper trade-off on its dual mandate of low inflation and full employment. Furthermore, with higher inflation and nominal interest rates, an overly generous expensing regime without interest limitations can lead to negative effective marginal rates for investment. Conversely, the switch to amortization of research and development expenses is more costly to firms in a higher-rate environment.

One takeaway from the Tax Cuts and Jobs Act is that some of the expired and expiring provisions, such as accelerated depreciation, generate more investment per dollar of tax revenue than do other provisions. We conjecture that R&D provisions would look similar, though leave a more confident conclusion on this point to future research. By contrast, the tax cuts to pass-through firms look quite unattractive: they are especially expensive in terms of how much investment they encourage, put pressure on the system by encouraging recharacterization of high-tax labor income in the form of a pass-through firm, and are perhaps the most regressive provisions in the entire bill.

Reforming international provisions that discourage investing in the United States—via tangible capital-based limitations like those in Foreign Derived Intangible Income and Global Intangible Low-Taxed Income—would likely result in more domestic investment. At the same time, provisions that encourage foreign capital accumulation by US firms can have domestic spillovers.

The expiring provisions of the Tax Cuts and Jobs Act will create pressure to revisit these topics, and avoiding the path of least political resistance—just renewing all the provisions—will be a challenge. The previous major business tax reform was the Tax Reform Act of 1986, which also benefited from unique historical features (Birnbaum and Murray, 1988). In that case, raising corporate taxes occurred with bipartisan cooperation under an extremely popular second term president and as part of a package that reduced individual taxes. But both large corporations and smaller pass-through firms are powerful constituencies.

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Exhibits

Table 1 Tax Changes by Industry

Industry (NAICS)	Code	Tax term (1 - Γ)/(1 - τ)			N
		Pre	Post	% Change	
Management of Companies	55	1.13	1.07	-4.8%	884
Accommodation and Food	72	1.09	1.05	-4.1%	214
Utilities	22	1.07	1.02	-3.9%	141
Transport and Warehousing	49	1.08	1.04	-3.8%	33
Manufacturing	31	1.07	1.03	-3.7%	434
Retail Trade	44	1.08	1.04	-3.7%	476
Wholesale Trade	42	1.07	1.03	-3.4%	1,207
Manufacturing	32	1.05	1.02	-3.1%	1,002
Manufacturing	33	1.05	1.02	-3.0%	1,944
Real Estate	53	1.06	1.03	-3.0%	190
Retail Trade	45	1.06	1.03	-3.0%	115
Health Care	62	1.06	1.03	-2.8%	167
Transport and Warehousing	48	1.04	1.02	-2.7%	261
Information	51	1.04	1.01	-2.5%	628
Mining, Oil, and Gas	21	1.03	1.01	-1.8%	224

Source: Chodorow-Reich et al. (2024).

Note: This table contains data on the average value of the composite tax term before and after the TCJA for different industries. Industries are determined by 2-digit NAICS code. The fifth column contains data on the % change in the tax term within that industry. The sixth column contains data on the number of firms in that industry in the full sample.

Table 2: Effects on Investment and Economic Activity by TCJA provision

Provision	Economic Impact		Citation
	Investment	Tax Revenue	
Corporate Rate Cut	Increased	Decreased	Chodorow-Reich et al. (2024); Kennedy, Dobridge, Landefeld, and Mortenson (2023)
Expensing	Increased	Decreased	Chodorow-Reich et al. (2024)
Interest limitations	Minimal	Increased	Goodman, Isen, Richmond, and Smith (2024)
GILTI (Global Intangible Low-Taxed Income)	Increased	Increased	Chodorow-Reich et al. (2024)

FDII (Foreign
Derived Intangible
Income) Ambiguous Decreased Chodorow-Reich et al. (2024)

Source: Authors' analyses of Chodorow-Reich et al. (2024), Kennedy et al. (2023), and Goodman et al. (2024).
Note: This table summarizes the predicted economic impact of each of the five listed provisions on investment and tax revenue. Citations for each of the predictions are provided in the fourth column.