Estimating the Distributional Implications of the Tax Cuts and Jobs Act

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Abstract

This paper will analyze the distributional impact of the Tax Cuts and Jobs Act. The TCJA included reforms to both business taxes as well as the individual income tax, with direct and indirect impacts on households. By changing the tax base for business net income, the TCJA changes the amount of income (pass-through income and investment income) subject to the individual income tax and accruing to households. The individual tax provisions have direct impacts through changes in statutory tax rates, the Child Tax credit and other provisions changing the calculation of taxable income.

The TCJA's indirect impacts occur through changes in behavior by individuals (work and saving decisions) and by businesses (investment, borrowing and international location of profits), which lead to higher pre-tax and after-tax incomes that alter the distributional impact of the TCJA. This paper will use open-source models to analyze the net effects of these provisions on households at different income levels.

I. Introduction

The Tax Cuts and Jobs Act passed in December 2017 with a number of provisions with direct and indirect implications for American households. While many of the individual side provisions are relatively straightforward to analyze, affecting households, for example, through cuts in the personal income tax rates, a doubling of the standard deduction and an expanded Child Tax Credit, the business side provisions are relatively more complicated. This is not only because the business side provisions themselves are less transparent, but also because the process by which corporate tax changes might affect workers and households is subject to debate. In this paper, we follow the approach used in Mathur and Kallen (2017) to first analyze the impact of corporate tax reform on investment, GDP and aggregate wages. Next, we add to that analysis for purposes of this paper, how those aggregate changes translate into changes in pre-tax and post-tax incomes for households at different income levels, after the TCJA. A novel contribution of this paper is the analysis of households across different demographics. For instance, using IRS Statistics of Income data, we can analyze how the TCJA affected larger households (with 2 or more children) relative to households with single adults. We also present results where we use the square root of household size to rank households as opposed to a ranking that reweights using marital status. Finally, we also present results for families based on the number of kids below age 18. These results go beyond the simple analysis traditionally presented that classifies households based only on pre-TCJA incomes and provides a better understanding of which households are affected and by how much based on the composition of their family structure.

Analysis of the TCJA has focused on the macroeconomic impacts and subsequently the distributional impacts in an effort to understand how the tax reform would affect working families. We begin first with an overview of the projected macroeconomic estimates of the TCJA from government agencies such as the CBO and the JCT. We also summarize projections from other organizations that use well-established modeling and methods to do such analyses.

The Congressional Budget Office estimates higher levels of savings, investment, employment and GDP as a result of the TCJA. GDP is expected to rise 0.7 percent over the 2018-2028 period, with the largest effects occurring during the middle years. Effects vary due to the mix of temporary- such as changes in the individual income tax rates through 2025- and permanent- such as the lowered corporate income tax rate- provisions. Investment is incentivized through the

lowered corporate tax rate and the lower income tax rate gives incentives to increase labor supply. The cap on the deductions for state and local taxes for mortgage interest will push residential investment down, however, the net effect on national investment is expected to be positive. In the long run, effects are dampened because the deficit is expected to rise, which inevitably leads to increased federal borrowing and interest rates, consequently crowding out and offsetting some of the aforementioned private investment. Demand for goods increases with increased consumer after-tax income, and this increased economic activity creates higher labor demand, wages, and therefore labor force participation rates. CBO anticipates that stronger output growth will be followed by higher inflation and higher exchange value of the dollar, which in turn the Fed will likely respond to by pushing interest rates up in the short-run. Long-run inflation is also likely to rise. GNP is expected to rise less than GDP, due to the provisions reducing net foreign income (CBO, 2018).

The Joint Committee on Taxation offers similar projections. It estimates that the TCJA will increase GDP by 0.7 percent, relative to the average level of output under present law, over the baseline 10-year window. The amount of capital stock available for production is projected to be 0.9 percent higher on average than it would have been without these provisions. This increased production is primarily driven by the increased investments from the lower corporate tax rates, the 100 percent bonus expensing provisions, and the tax deduction for qualified pass-through business income. The conventional estimated loss of $1,456 billion over that period is offset by this revenue increase by approximately $451 billion. JCT estimates a $66 billion increase in the cost of Federal debt service driven by the increased interest rates that will result from the aforementioned investment increases. GDP and resulting revenues are expected to increase in the following decade as well, though at lower levels, since many of the provisions expire in 2026. When all economic feedbacks are considered, the economic growth will reduce the deficit by $385 billion during the 10-year baseline window of analysis. This results in a net total increase in the deficit by $1,071 billion from 2018-2027 (JCT, 2017b).

The changes to the individual income tax rate will reduce average tax rates on wage income by approximately 1 percentage point and reduce the effective marginal tax rates on wages by approximately 2.5 percentage points. Employment is projected to increase 0.6 percent due to these marginal tax rate reductions (as well as the increased Child Tax Credit), and when the provisions expire, employment will likely decline. Consumption is estimated to increase 0.7 percentage points

on average above the baseline budget window. The foreign taxation provisions disincentivize "profit-shifting", increasing the US tax base. Essentially, the new tax code makes keeping US business activity within domestic borders more favorable. Investment in the US is expected to increase partially due to the changes in taxes on foreign investment, as well as the reduction in the cost of capital for domestic investment.

Organizations such as the Tax Policy Center and Tax Foundation also predict a short-term boost to GDP followed by increases in debts and deficits and a slower rate of growth in later years. As per the Tax Policy Center (TPC), aggregate demand and aggregate output are expected to increase due to the increase in households' disposable income resulting from the lower average tax rates, and by allowing businesses to deduct expenses on new investments. The effective tax rates on labor income are reduced though the marginal income tax rate reductions of workers, therefore increasing the labor supply by incentivizing (mostly low-wage earners) to enter the work force or work additional hours. After-tax returns on savings and investment increase due to the reduced corporate income tax rate, therefore encouraging saving, foreign capital inflows and investment. Together, these effects should raise GDP by 0.8 percent in fiscal year 2018. These effects drop in drop sharply after 2025, when most of the individual tax provisions expire. Effects are negligible by 2027, when many provisions are set to expire (Page et al., 2017).

Furthermore, TPC calculates that that the increased taxable incomes would reduce the revenue loss induced by the legislation by $186 billion from 2018 to 2027 (approximately 13 percent). Deficits excluding interest costs are expected to decline by $415 billion from 2028 to 2037, and the economic feedback would boost deficit savings by $3 billion during that timeframe. When considering economic feedback effects and interest costs, the TCJA is estimated to increase debt as a share of GDP 5 percentage points in 2027 and almost 4 percentage points in 2037 (Page et el., 2017).

Finally, as per the Tax Foundation's Taxes and Growth Model, the plan would significantly lower marginal tax rates and the cost of capital, causing a 1.7 percent increase in GDP over the long term, 1.5 percent higher wages, and 339,000 full-time equivalent jobs to be added to the economy. The Tax Cuts and Jobs Act would generate an additional $600 billion in federal revenues from economic growth. These new revenues would help to offset the deficit increases arising from the TCJA's overall tax cuts. In 2018, GDP would increase 0.44 percent under the TCJA provisions. Tax Foundation projects a 10-year total GDP increase of 2.86 percent, which averages to be an

additional 0.29 percent per year over baseline forecasts. On a static basis, in 2027, the plan would lead to 0.3 percent lower after-tax income on average for all taxpayers and 0.6 percent lower after-tax income on average for the top 1 percent. When accounting for the positive economic feedbacks, after-tax incomes of all taxpayers is projected to increase 1.1 percent in the long run (Tax Foundation, 2017a).

The next step is moving from these macroeconomic impacts to analyzing the distributional consequences of these tax reforms. As per a report released by the JCT immediately following the passage of the tax bill in December 2017, the aggregate impact of the tax bill would be a short-run decline in federal taxes paid by all or most households in the years 2019 to 2021. After that, taxes would increase relative to the baseline on those earning less than $30,000, for every year between 2023 to 2027. However, upper-middle-income and high-income households would continue to see declines in federal taxes paid for the entire 10-year window, with the highest income households (those earning over $1 million), expected to see the biggest drop in federal taxes paid. Similar analysis was produced by the Tax Policy Center. On average, as per the TPC report, the bill would reduce taxes for all income groups in 2018 and 2025. Overall, higher income households would see a higher tax cut (as a percentage of after-tax income), with the largest cuts seen in the 95th – 99th income percentiles. Compared to law prior to the enactment of the TCJA, 5 percent of taxpayers would see a tax increase in 2018, 9 percent would see a tax increase in 2025, and 53 percent in 2027, the year in which many of the individual income provisions are set to expire (Tax Policy Center, 2017).

Overall, average after-tax income increases 2.2 percent in 2018 (an average tax reduction of about $1,600). In 2027, the average after-tax income would be 0.2 percent higher than under pre-TCJA law.

TPC also did a breakdown of who benefits and who is hurt from the tax bill, based upon the hypothetical different family structures. For instance, they find the following: (a) *Married Couple with two young or two older children.* At a household income of $75,000, a family with two children younger than 17 years of age and a family with children ages 17 and 18 would both see a tax decrease under TCJA (assuming they take the standard deduction rather than itemizing). The family with younger children would see a tax cut of $2,119, while the couple with older children sees a tax cut of $1,119. Both households are affected by the increased standard deduction, elimination of personal exemptions and lower personal income tax rate. The household with two

young children claims the child tax credit for both dependents, but the couple with children ages 17 and 18 receives the increased child tax credit for claiming the younger child, while then receiving a credit for dependents not eligible for child tax credit ($500/dependent). Since only the personal exemption amount is indexed for inflation, the net benefit of the expanded child tax credit and loss of personal exemptions would shrink. Furthermore, with the individual tax provisions expiring in 2026 not but the chained-CPI provision, both households would see a tax increase of $150 in 2027 (as compared to the baseline pre-TCJA law). (b) *Single high-earner with wages or self-employment income.* TPC then illustrates a scenario with two single taxpayers with an income of $250,000: one with income entirely from wages and salaries and the other with income derived from self-employment. We then assume both itemize under pre-TCJA law, claiming state and local income taxes of $17,500, property taxes of $8,000, and combined mortgage interest/charitable contributions of $20,500. The wage earner's taxes increase $149 due to the capped SALT provision and elimination of the personal exemptions. He still itemizes in this scenario, and is there unaffected by the standard deduction. The self-employer would itemize, but pays less because he can deduct 20 percent of qualified business income. This deduction more than compensates for the loss of personal exemptions and the $10,000 SALT cap. Therefore, the self-employer sees a tax cut of $14,485. Income derived from specified service businesses (e.g. health, law, and financial services) requires a phase-out of the deduction on qualified business income above a threshold. Therefore, it matters what industry the self-employed taxpayer earns his income in; if the income was in fact earned in a service business, his taxes paid would be the same for the wage-earner. Under TCJA in 2027, both individuals would see a tax increase of $812 because the individual provisions expire, except for the chained-CPI indexing.

The report highlights other results as well. But, to summarize, it is often lost in the larger debate about the TCJA that many of the provisions could have heterogeneous affects across families depending upon their specific structure and the types of deductions, exemptions and other provisions that they were availing of prior to the TCJA. Hence, a more detailed understanding of the implications of the tax bill for households, one that goes beyond simply their annual income, is warranted.

In the next section, we discuss the TCJA provisions and explain which ones we are modeling and how, with a brief explanation as to why we made those choices. In Section 3, we provide an overview of the data used. Section IV provides an outline of our methodology and

explains why it differs from the analyses discussed thus far. Finally, in Section V, we present our results, and Section VI concludes with a discussion of our main findings.

II. Individual and Business Side Provisions in the Tax Cuts and Jobs Act

Individual Tax Reforms under the Tax Cuts and Jobs Act

As seen in Table 1, the passage of the Tax Cuts and Jobs Act was a significant overhaul of the prior tax code. It included changes to the personal income tax schedule and rates. Other major provisions include the standard deduction nearly doubling across all filing statuses and the elimination of the personal and dependent exemption. There were also several changes to the Child Tax Credit. The phase-out rate thresholds significantly increased, though the phase-out rate of 5% did not change. The credit amount itself increased, as indicated by Table 1, yet with several complexities added. Part of the expansion of the Child Tax Credit is nonrefundable. For the portion that is refundable through the Additional Child Tax Credit, the TCJA lowered the threshold for the ACTC refund from $3,000 to $2,500.

The alternative minimum tax provisions underwent rather significant reforms. AMT-taxable income includes several things that the regular income tax schedule excludes, and the AMT tax rate is calculated if income exceeds a particular threshold. If the amount owed under the AMT exceeds the tax liability of personal income taxes, then the taxpayer pays the tax amount owed under the AMT structure. The top alternative minimum tax rate remains at 28 percent. Under current law, the AMT rate starts at a much higher threshold and the amount deductible when calculating AMT income is much larger than under 2017 law. This, along with the end to personal exemptions described below, resulted in far fewer taxpayers falling subject to the AMT tax liability (Gleckman, 2018).

Moreover, the TCJA reformed several itemized deductions. Previously, itemized deductions were reduced by 3 percent for every dollar of taxable income over certain thresholds, for a total deduction value of up to 80 percent of filers' itemized deductions. This reduction and limitation no longer exist, and itemized deductions are allowed in full. There were several other itemized deduction reforms: increased the ceiling for deductions of charitable contributions,

eliminated deductions for the casualty expense, eliminated deductions for alimony payments and exclusion of alimony received from taxable income, capped the maximum deductible amount of business losses, allowed medical expenses exceeding 7.5% of AGI to be deductible (note that this was retroactive for 2017; through 2016 only expenses exceeding 10% of AGI were deductible for non-elderly filers), capped the amount of state and local income, sales and real estate tax deductions allowed at $10,000, lowered the indebtedness threshold for home mortgage interest deductibility, eliminated the miscellaneous expense deduction, and eliminated the Affordable Care Act's "Cadillac Tax" that burdens employers with private healthcare plans exceeding predetermined premium thresholds.

Finally, the price-indexing mechanism changed from CPI-U to chained CPI – a measure that allows for substitution effects and ultimately calculates inflation to rise more slowly. It is important to note that many of these provisions are set to expire in 2026, and a few phase-out over the next decade.

Business Tax Reforms under the Tax Cuts and Jobs Act

There were several major revisions to the corporate tax code, most notably including the lowering of the statutory corporate tax rate to a flat 21 percent. Additionally, the pass-through business income tax schedule changed with the individual income tax reforms. Pass-through business income is the portion of income derived from sole proprietorships, partnerships, and S-corporations. Furthermore, pass-through income can exclude 20 percent of all qualified business income (QBI), which is limited by taxable income and the amount of wages paid by the business and is further limited for business income from a service trade or business. Another major change is the elimination of the alternative minimum tax for corporations. Entertainment expenses are now non-deductible. The TCJA also expanded the Section 179 deduction by raises the phase-out threshold, and it increased bonus depreciation to 100 percent through 2022, after which phases out. The TCJA also limited the deductibility of net interest paid to 30 percent of adjusted taxable income, and it revised the net operating loss rules to eliminate carrybacks but allow indefinite carryforwards of losses.

There were major changes made to international business income provisions. Such reforms include the participation exemption, a one-time tax on foreign held earnings, a worldwide minimum tax on intangible income through FDII and GILTI, and the BEAT, which is intended to reduce the ability of multinational corporations to strip income from the US tax base via excess payments to foreign-affiliated corporations. These provisions are detailed more thoroughly in Table 2, but note that there exists complexity to these reforms, beyond the scope of this paper.

III. Distributing the Individual Income Tax Provisions

For our distributional analysis of the individual income tax provisions, we rely on the open source Tax-Calculator microsimulation model. This model uses detailed tax records to simulate the US federal individual income and payroll tax systems. The tax records originally come from the 2011 IRS public use file, but they have been modified using the open source taxdata repository. These modifications, including a match to the Current Population Survey public use files, provide information not available in tax records. As a particularly useful example, this model imputes tax-preferred expenditures for non-itemizers and receipt of means-tested benefits, allowing for richer analysis of policy provisions than possible using the raw tax records alone.

Methodological Considerations

When performing a distributional analysis, we identify five methodological questions that affect the results: the unit of analysis, the income measure to use, how to compare incomes of units of different sizes, which groups to exclude from the analysis, and which measures to present. The decisions on each of these issues have the potential to shape the implications of the presented results.

The choice of the unit of analysis largely depends on the data source used. The Joint Committee on Taxation (JCT) and the IRS Statistics of Income tables use tax returns as the unit of analysis (JCT, 1993). Although tax returns are a convenient unit of analysis for the distributional effects of changes in tax policy, it is worth considering alternatives. The Congressional Budget Office uses households from the CPS, matched with tax data from the IRS Statistics of Income public use files, as their unit of analysis (CBO, 2018a). The use of households provides an

advantage in that tax burdens are more reflective of a filer's ability to pay, and they include types of income not available in the IRS SOI public use file.

Our data file uses tax returns as the unit of analysis, with additional information imputed using a CPS match. As part of the sensitivity analysis of distributional results, we consider different weighting methods. With no weight adjustments, the distributional analysis is directly applicable to tax returns. On the other hand, weighting by the size of the filing unit would make the distributional analysis more applicable to the overall population, and weighting by the number of adults in the filing unit would make the analysis applicable to the adult population.

Given a unit of analysis, the crucial question for distributional analysis is the choice of income measure. For tax return data, the simplest measure of income would be Adjusted Gross Income (AGI). However, AGI explicitly and implicitly excludes many types of income. The calculation of AGI explicitly excludes several sources of income, such as interest from municipal bonds contributions to tax-preferred savings accounts, as well as allowing above-the-line deductions for tax-preferred expenditures, such as student loan interest and educator expenses. Given that these exclusions are subject to tax policy decisions (such as the TCJA's elimination of the deduction for alimony paid and the new exclusion for alimony received), these should be included in a broader income measure for distributional analysis. However, there are additional sources of income that are implicitly excluded from income for tax purposes, such as unrealized capital gains, means-tested benefits, and employer pension and health insurance contributions. The JCT begins with AGI and adds tax-exempt interest, workers' compensation, nontaxable Social Security benefits, excluded income of citizens living abroad, net value of Medicare benefits, alternative minimum tax preferences, employer contributions to health plans and life insurance, and the employer share of payroll taxes. JCT then adds the workers' and capital owners' shares of the corporate income tax and workers' share of pass-through taxes. Instead of beginning with AGI and adding back components, CBO uses information on taxable income sources from the SOI tax record and nontaxable income sources from the CPS record. This allows them to add labor income, business income, capital income (excluding unrealized capital gains), social insurance benefits and means-tested transfers. They also include in their income measures the labor and capital shares of the corporate income tax (CBO, 2018a). We discuss the distribution of the corporate income tax in section V.

In addition to the measure of total income, there is an open question regarding whether the appropriate income measure for distributional analysis is pre-tax and whether it should include transfers. For our purposes, we use the broadest measure of income, pre-tax income after transfers.

Our income measure relies on income information from tax returns as well as imputations of other income sources from the CPS. This measure, which we refer to as expanded income, consists of wage and salary income; pension contributions; interest income, both taxable and nontaxable; dividends; state and local income tax refunds; alimony received; net income or loss from Schedule C (sole proprietorships), Schedule E (rental, royalty, partnership and S corporation income); reported capital gains or losses; taxable IRA distributions; pension and annuity income; AMT taxable income items; the employer share of FICA taxes; and the consumption value of government benefits received, including reported sources (e.g. Social Security benefits) and imputed values (e.g. cash value of SNAP benefits).

Unlike JCT and CBO, we do not include the corporate income tax as part of income, as this should already be implicitly included in capital and labor income. We only incorporate the changes in incomes resulting from changes in the corporate income tax, which we discuss further in section III. We also do not impute the rental value of housing, unrealized capital gains, or the difference between real business income and taxable business income from pass-through business activity.

Once a measure of income and the unit of analysis are determined, the question arises how to compare incomes across different units. Income may not be directly comparable across types of filers; for example, how should we compare $100,00 of income for a married couple filing jointly against the same income for a single filer or for a married separate filer? As the OECD has noted, income spread in a larger household has less purchasing power than the same income for a smaller household, but that the relationship is nonlinear due to economies of scale in consumption, particularly housing (Atkinson, Rainwater and Smeeding, 1995). Furthermore, the nonlinearity of household size may depend on how to weight different household members, such as comparing children and adults.

The potential solutions to these questions revolve around equivalence scales, measures by which we rescale income to more appropriately compare economic status. The general formula for an equivalence scale is

$$S = (1 + w_a(n_a - 1) + w_c n_c)^e$$

where n_a is the number of adults, and n_c is the number of children. This formula gives an effective weight of 1 to the head of household (or equivalently, the first adult), a weight of $w_a \in [0,1]$ to each additional adult, and a weight of w_c to each child. The elasticity parameter $e \in [0,1]$ adjusts for the nonlinearity in the effect of household size. This formula provides flexibility in choosing the scale to use. For example, JCT does not rescale ($e = 0$), CBO rescales by the square root of household size ($e = 0.5, w_a = w_c = 1$), the Oxford scale assigns values of 1 to the first adult, 0.7 to all other adults, and 0.5 to each child ($e = 1, w_a = 0.7, w_c = 0.5$), and the OECD modified scale recommended by Hagenaars et al (1994) assigns values of 1 to the first adult, 0.5 to all other adults, and 0.3 to each child ($e = 1, w_a = 0.5, w_c = 0.3$) (Atkinson, Rainwater and Smeeding, 1995).

Although these may seem arbitrary, the choice of equivalence scale can have important effects. Equivalence scales that increase with the size of the unit of analysis cause these units to be placed relatively lower in the income distribution. For tax changes that have different effects on households of different sizes, equivalence scales have nontrivial effects on distributional implications, which we explore further in this section.

In addition to rescaling and reranking incomes, the issue arises of which units should be excluded from the analysis. CBO's use of the household as the unit of analysis reduces this issue, but relying on tax data requires considering whether to exclude tax units that represent only parts of economic units, namely married separate filers and dependent filers. For example, JCT excludes dependent filers from their analysis.

Furthermore, we must consider how to deal with taxpayers with negative incomes caused by losses. Due to potential gaming in the timing of losses, income after large losses may be poorly reflective of real economic income. As an example, a filer with $150,000 of wage income and $140,000 of business losses would be considered low-income, although we cannot distinguish losses realized for tax planning from losses resulting from an actual reduction in economic resources. For their distributional analyses, JCT excludes those with negative income. Alternatively, one could exclude anomalous units, such as those with tax burdens greater than their incomes, or exclude the bottom 5 or 10 percent of the income distribution due to substantial mismeasurement issues, such as in Pechman (1985). For our main results, we exclude those with negative income when sorting tax units into income groups, but we include them in totals.

Finally, we must decide which measures to present and how to present them. Whereas the other decisions occur relatively behind-the-scenes, the choice of which metrics to present is clear to any reader. For example, Tax Foundation's preferred measure is the percent change in after-tax income, and Tax Policy Center presents the percent change in after-tax income, the share of the total tax change, the average tax change in dollars, and the change in the average federal tax rate (Tax Foundation staff, 2017; Tax Policy Center, 2017). JCT presents the change in federal taxes in dollars and percent and average tax rates (JCT, 2017a).

All of these metrics and others provide at least some value. Average tax rates are good representations of the burdens on different income groups. The percent change in after-tax income carries economic significance as a measure of disposable income for households, and it is relevant in computing the reduced-form income effect in the labor response. The share of the total tax change and the average dollar tax change represent the change in the tax burden in a method comparable to how we consider the distribution of government expenditures. The fraction of households in each income group receiving tax cuts or tax hikes can be important to understand the political impact of a tax change. Finally, we can also measure progressivity of a tax change more directly using the Kakwani index, a measure of the progressivity of a tax system or a tax change that resemble the GINI index (Kakwani, 1977).

Unfortunately, the choice of metrics presented is also potentially subject to abuse, as different metrics can make tax changes appear relatively more progressive or regressive relative to a baseline of a progressive tax with income inequality. Table 3 presents this comparison for five hypothetical tax units, with three tax hikes: a proportional tax hike, a progressive surtax on the existing progressive tax liability, and a regressive surtax on existing after-tax income. The relevant surtax rates are chosen to match an overall 1% tax hike.

Even in a simple example such as this, the choice of metric is highly relevant to the perceived progressivity or regressivity of a tax change. The change in the average tax rate accurately shows which tax change is proportional, progressive and regressive (as would the Kakwani index). However, the dollar change in tax liability and the share of the tax hike on each income group both appear to show that the top income group bears most of the burden for all three types of tax changes. This result is important for analysis of the TCJA; because income is not distributed equally, tax changes that are modestly progressive, modestly regressive or proportional will all give most of the tax change to the top income groups. Similarly, because the existing tax

system is progressive, the percent change in after-tax income makes tax changes appear relatively more progressive or less regressive than a more objective metric would indicate. Moreover, many of these measures can become misleading when behavioral effects (such as using an elasticity of taxable income) are included. For example, a revenue-neutral and distribution-neutral reform that increases labor supply (such as through a marginal rate reduction offset by base-broadening) would cause incomes, taxes and average tax rates to all increase. In a non-static context, average tax rates and dollar tax burdens are misleading, and the appropriate measure for the distributional impact is the percent change in after-tax income.

Finally, we must decide which income groups to present. JCT presents results using round dollar cutoffs for income groups, which is more consistent with how results are displayed in the IRS Statistics of Income tables. On the other hand, Tax Policy Center and Tax Foundation present distributional results in quintiles, with the top quintile broken into smaller groups to provide a clearer understanding of the distributional impact across high earning filers. For our analysis, we present the results for the first nine deciles, and we break the top decile into smaller groups like Tax Policy Center and Tax Foundation.

Main Results

For each year, we split our distributional analysis into two tables. The first compares measures of the level of the tax burden under pre-TCJA law and under the TCJA: the average tax rate, the income group's share of the total income and payroll tax burden, and the percent with zero or negative individual income tax liability. The second table presents measures of the changes in the tax burden: the percent change in after-tax income, the average change in tax liability (in dollars), the income group's share of the total change in the tax burden, the share of units in each income group receiving a tax cut, and the share receiving a tax hike. These results for each year are presented in tables 4(a) – 4(k).

As we can see from the tables, in 2018, most households should experience lower average tax rates than prior to the TCJA. What is interesting is that within each group, some households will receive a tax hike and some a tax cut. For instance, within the top 1 percent, nearly three-fourths will receive a tax cut, averaging over $9000, while a quarter will face a tax hike relative to before the TCJA. Hence, even within deciles, there are interesting variations relating to which families will benefit and which will get hurt due to the individual side provisions. This picture

looks very similar till 2026. In that year, with the expiring of many of the individual provisions, there is a dramatic change with nearly 99 percent of households in the upper income distribution experiencing a tax hike relative to current law. Even among lower income households, a big fraction, close to 50 percent, experience a tax hike.

Sensitivity Analysis

As described throughout this section, the choices involved in distributional analysis can have important effects on the implications of the results. In this section, we consider how alternative assumptions affect the distributional analysis of the TCJA. Throughout this section, recall that these alternative assumptions change the relative positions of tax units in the income distribution, and so income groups consist of different tax units.

Table 5 presents the effects on the average tax rates of changing the equivalence scale, using: no scale; scaling by the size of the tax unit, which is consistently compares split tax unit against joint ones but assumes ignores the nonlinearity of the effect of size; scaling by the square root of size, our preferred equivalence scale; the Oxford scale; and the OECD-modified scale. These comparisons use no weighting, and they exclude those with negative incomes. We produce this comparison only for 2018, as the sensitivity of average tax rates to the given assumptions will change little from year to year, until the expiration of most of the individual income tax provisions in the TCJA.

Because the income of the tax unit is divided by the equivalence scale for ranking purposes, equivalence scales that increase with respect to household size cause larger tax units (usually due to more children) to be ranked relatively lower in the income distribution. Because filers with children are eligible are eligible for the Child Tax Credit and potentially the Earned Income Tax Credit, these filers have lower and often negative tax rates, and they benefit relatively more from the expansion of the Child Tax Credit.

We also test the sensitivity of a simpler measure of progressivity, the Kakwani index, to the assumptions. Table 6 presents these results for several years, using alternative equivalence scales, weighting systems, income measures and different excluded groups. Using our preferred methods, the TCJA is slightly progressive for the years before most provisions expire. If we switch to using no equivalence scale, then the TCJA appears slightly regressive, and using the broadest

equivalence scale makes the TCJA more progressive. However, once most of the provisions expire, the TCJA's unexpired provision (chained CPI indexing) is highly regressive.

Distribution to Different Demographics

To better understand the distributional effects of the TCJA, it is useful to consider the specific distributional effects on population subgroups. We compute the average tax rates before and after the TCJA, as well as the dollar changes in tax liability. For these tables, we use no equivalence scale. This allows us to present the fraction of filers in each income group to better understand how the income distribution of population subgroups compares to the overall income distribution. For example, Table 7(a) shows that among married couples filing jointly, only 13.1 percent are in the bottom four deciles. Married couples are thus relatively higher income than unmarried filers, whose distribution is shown in Table 7(b). Furthermore, because the TCJA corrected several marriage penalties, the tax cuts for married filers are larger than those for unmarried filers, with an average tax cut for married joint files of $2,121 and an average tax cut for unmarried filers of $469. Notably, the TCJA increased taxes on unmarried filers in the top 1 percent of the income distribution.

Similar disparities can be seen when restricting the distributional analysis based on the number of children in the filing unit, which are presented in Tables 8(a), 8(b), 8(c) and 8(d). Although average tax rates pre-TCJA increase with the number of children in a filing unit, filers with more children are also relatively more affluent. Comparing average tax rates within income groups across numbers of children reveals that average tax rates generally decrease with the number of children when controlling for income level (as one would expect). Moreover, the tax cuts in the TCJA are substantially larger for filers with more children, with an average tax cut of $772 for filers without children, $1,216 for filers with one child, $2,151 for filers with two children, and $2,441 for filers with three or more children.

IV. Distributing the Corporate Tax Provisions

Distinguishing the Static and Dynamic Distributions

In recent years, applied methodologies for distributing the corporate income tax have been updated to assume that part of the burden is shifted from corporate equity to labor and to

other forms of capital. As of 2012, the Treasury Department allocates 82 percent of the burden of the corporate income tax to capital and 18 percent to labor (Cronin et al., 2012). The Congressional Budget Office distributes 75 percent of the burden in proportion to households' capital income and 25 percent in proportion to their labor income (CBO 2018a). As of 2013, the Joint Committee on Taxation allocates 75 percent of the burden to domestic capital and 25 percent to domestic labor (JCT, 2013).

These changes reflect the findings in general equilibrium models that the burden of the corporate income tax falls on other sectors of the economy in open economy models with capital mobility. Unlike the original Harberger (1962) model, which found that capital bears the entire corporate tax burden (both corporate and noncorporate capital) under certain assumptions, subsequent literature has investigated the general equilibrium distribution of the burden, allowing that the corporate tax burden is shifted at least in part from owners of domestic capital to domestic labor and to foreign capital under various assumptions, in particular the relevant openness of the economy. These general equilibrium models are reviewed in greater detail in Gravelle (2013) and Auerbach (2006). Although these present valuable information on the equilibrium burdens of the corporate income tax, they often do so using highly stylized models of the corporate income tax system. More importantly, as both Auerbach (2006) and Gravelle (2013) emphasize, these burdens may be of little relevance in the short-run, as macroeconomic changes resulting from the corporate income tax may take a long time to reach equilibrium. Accordingly, applied approaches to allocating the corporate income tax burden, such as in JCT (2013), Cronin et al (2012) and Nunns (2012), use distributional estimates from these general equilibrium models to estimate the distribution of the corporate income tax under current law and under reforms.

An important consideration in these methods of allocating the burden of the corporate income tax is the difference between the normal and supernormal returns on investment. This distinction allows distributional analyses to apply different distributional effects to corporate tax changes that affect the normal and supernormal returns differently. As Cronin et al (2012) explain, changes in depreciation rules only affect the normal return to capital, whereas changes in the corporate tax rate apply to normal and supernormal returns. The distinction can also be used to estimate how the corporate tax burden affects noncorporate forms of capital, such as in Tax Policy Center's distribution of 60 percent of the burden to supernormal returns on corporate

equity, 20 percent to the normal return on capital across all sectors, and 20 percent on labor (Nunns 2012).

The allocation of the normal burden requires addressing whether the corporate income tax affects capital in the noncorporate business sector. For example, Nunns (2012) distribute the burden on the normal return to capital across both the corporate and noncorporate sectors. On the other hand, JCT (2013) assumes that rates of return do not equalize across corporate and pass-through capital, arguing that this is due to restrictions on entity choice and that C corporations are more likely to do business internationally. With this assumption, JCT (2013) distributes such that corporate taxes do not affect pass-through businesses and pass-through taxes do not affect corporate businesses. However, this distributional assumption is belied by empirical evidence on the effects of state taxes on organizational form (Goolsbee 2004). New research from Chen, Qi and Schlagenhauf (2018) also identifies that this organizational form distortion has a nontrivial effect on capital allocation, with a reduction in the corporate income tax burden encouraging use of the C corporation form, which has greater access to capital than a pass-through form.

Finally, as noted in Auerbach (2006), the use of corporate tax burden in general equilibrium may be misleading when considering changes to the corporate income tax because the adjustment from the previous equilibrium to the new one does not occur immediately. In that sense, the initial shareholders bear the portion of the change in the corporate tax burden not shifted, but future capital owners and workers bear the portion of the change in the corporate tax burden that is shifted through changes in investment and organizations form decisions. Furthermore, the actual transition path from one equilibrium to another is uncertain in these models. Accordingly, JCT (2013) assumes that the long-run equilibrium occurs at the end of the budget window, and they transition between the short-run and long-run equilibrium burdens to achieve this.

For our distributional analysis, we do not attempt to distribute the level of the corporate tax burden in equilibrium, which is already incorporated in realized incomes. Instead, we distribute the change in the corporate tax burden, which we can separate into the static and dynamic burdens. The static burden reflects the change in corporate tax liabilities, distributed as changes in income from corporate equity, which can be held by various types of organizations and by individuals in different forms. For the dynamic burden, we use a simple growth model to estimate the changes in incomes along the transition path to a new equilibrium, and we update the distributional analysis accordingly.

To distribute the static burden, we first identify the owners of corporate equity. Although there are many types of equity owners, it is important to trace through the indirect burden of a windfall change in corporate equity to households wherever possible

Burden Not Distributed to Households

There are two types of entities for which we ignore the distribution of the corporate tax burden. The first is for corporate equity owned by the federal government; this is part of the net revenue change resulting from a change in the corporate income tax. The second and larger group is foreign owners of U.S. corporate equity. We can treat a windfall gain or loss to them as not affecting American households. It is important to note two potential qualifiers to this assumption. If other countries cut their corporate income taxes in response to a cut in U.S. corporate income taxes, then American owners of foreign corporate equity would gain. The exclusion of the distribution may also be less accurate in a general equilibrium model with changes in flows of savings between the U.S. and the rest of the world.

Distributing to Nonprofit Shareholders

Because nonprofit organizations own corporate equity but do not themselves have owners, distributing the change in the corporate income tax to nonprofit shareholders requires assumptions about the individual stakeholders in a nonprofit. As JCT (2013) notes, nonprofit organizations have stakeholders who would be affected by a change in the value of corporate equity held by those nonprofits, but identifying these stakeholders is difficult. Accordingly, JCT assumes that these stakeholders are distributed similarly to individual owners of capital. This assumption is problematic, increasing the measured progressivity of the corporate income tax. Auerbach (2006) identifies three categories of potential stakeholders: donors changing contributions in response to a change in the nonprofit's assets; employees of nonprofits through reduced compensation; and beneficiaries of nonprofit spending (excluding wage compensation to employees). Auerbach (2006) notes that there is little evidence to allocate the burden between these groups. Additional complexities arise in considering these in an applied context. For any burden passed through to donors through higher contributions, the deductibility of charitable contributions shifts part of the burden to the federal and state governments. For the burden passed through to employees, the wage distribution of employees of nonprofit organizations may

not match the wage distribution for the rest of the population. Finally, there is no evidence to consider a distribution of nonwage spending by nonprofits, as they can provide support to anything from large organizations to the lowest-income individuals and families.

Table B1 considers how the distribution of a windfall change in corporate equity held by nonprofit organizations is affected by the underlying assumption about the stakeholders in the nonprofits. We consider five different assumptions: stakeholders are distributed like domestic capital owners (JCT, 2013); stakeholders are distributed like recipients of government benefits (concentrated among low-income and elderly people); the burden is passed through to donors through additional charitable contributions; the burden is passed through to employees, with an assumption that nonprofit wage income is distributed like overall wage income. Note that these will also interact with the federal income tax, as the additional charitable contributions will be partially subsidized by the itemized deduction for them, and as the loss of wages will be partially offset by reduced income taxes. However, the burden as passed through to recipients of nonprofit services will not receive any offset through tax systems. Because the federal tax offsets depend on the actual tax system, we do not present the comparison here. However, the offsets in general are greater for higher income groups because these groups are usually subject to higher marginal tax rates.

The final assumption is our preferred combination of these forms. Because donations are voluntary, we assume that they burden through nonprofits is split between spending for services provided to others and spending for general non-service expenses. This latter category includes employee compensation, professional fees (management, legal, accounting, lobbying, investment management, etc.), and maintenance of the organization (office expenses, travel, depreciation, etc.). Together, these expenses constitute most of nonprofit spending, and we assume that they match the overall distribution of wages.[1] The expenses for services include grants to domestic individuals, governments and other organizations, as well as the spending on other services. Using IRS statistics on spending by nonprofit organizations, we estimate that 20.8 percent of nonprofit spending goes to actual services provided, 78.0 percent goes to general non-service

[1] Although employees of nonprofit organizations generally receive less compensation than employees of for-profit businesses, this may be offset by nonprofit spending on management, legal, accounting, lobbying, professional fundraising and investment management fees.

expenses, and 1.2 percent is provided as grants to foreign governments, organizations and individuals, who we do not count in our distributional analysis.[2]

Distributing to private pension funds

When distributing the corporate tax burden through private pension plans, we distinguish between defined contribution plans and defined benefit plans. For defined contribution plans, we distribute the windfall change in corporate equity to the individuals who own the accounts, which we discuss in the section on individual distribution below. For defined benefit plans, a windfall change in corporate equity owned by the plans should be offset by a change in the required contributions by the organization responsible for the payments. If the defined benefit pension plan is owned by a state or local government, this burden should be allocated with the windfall accruing to the government through directly owned corporate equity. For defined benefit pension funds for corporations, the windfall generally should accrue to their shareholders (which is netted out) because the funds are used to pay pension liabilities. However, Auerbach (2006) notes that this may break down if changes in health of the pension fund affect bargaining between the employer and employees or if the corporation can shift part of the pension cost to the Public Benefit Guarantee Corporation. Because there is little evidence on which consider these two deviations from the basic case, we do not include these in our applied analysis.

Distributing to State and Local Governments

State and local governments can own corporate equity either directly or through defined benefit pension funds, and as such will receive an increase in revenue (or decrease in net pension liability) from a windfall to corporate equity. However, distributing this windfall to individuals or households requires some ability to estimate how these governments would respond to additional net revenue. If they reduce taxes, the distributional impact will depend on which types of taxes are reduced. As noted in Kallen, Slavov and Viard (2017), most state tax systems are regressive, and in 2015 only three states had progressive tax systems (California, Oregon and Delaware). Accordingly, a reduction in state taxes in response to a windfall gain from a federal

[2] Authors' calculations based on expenses of nonprofit organizations as reported in Form 990, for organizations 501(c)(3) through 501(c)(9). IRS SOI Tax Statistics, "Charities and Other Tax-Exempt Organizations Statistics: Table 2. Form 990 Returns of 501(c)(3)-(9) Organizations: Total Functional Expenses, by Code Section, Tax Year 2015", https://www.irs.gov/statistics/soi-tax-stats-charities-and-other-tax-exempt-organizations-statistics.

corporate tax cut could be progressive. A more progressive assumption would involve the state and local governments using the windfall to provide increased services or transfers to low-income households.

Table B2 provides a breakdown of this distribution using several assumptions of how state and local governments would use a windfall. These options include several options for state and local policymakers: governments would increase spending in a way that follows the existing distribution of government benefits;[3] they would increase compensation to state employees, modeled using the overall wage distribution; and they would reduce taxes, modeled using itemized state and local taxes and imputed state and local taxes for nonitemizers. Note that for corporate equity held in defined benefit pension plans, a state or local government that chooses to do nothing in response to a windfall will have to consider the same decision in the future, as the windfall changes the required contributions to those pension funds. In the absence of additional information, we assume that state and local governments will pay any windfall out as bonuses or spend in such a way that the distributional impact is effectively identical to the distribution of wage and salary income.

Distributing to Individual Shareholders

Finally, we must distribute the windfall change in corporate equity directly to individual shareholders. When distributing directly to owners of capital, the usual approach assumes that the burden is proportional to the filer's or household's capital income. These generally include income from tax-preferred savings vehicles, income from bonds, and income from equity. Because this section only distributes the static change in the tax, rather than the dynamic total burden of the tax, we do not need to use information on bond ownership. Instead, we separate distribute to directly held corporate equity and to indirectly held corporate equity (in tax-preferred savings vehicles).

Although we do not need to distribute to all capital, we still require a measure of the corporate equity to distribute the corporate income tax. Although some approaches use equity income to proportionally distribute the corporate income tax, equity income may be a poor measure of equity ownership. As JCT (2013) notes, there is a disconnect between actual capital

[3] Note that this assumption seems somewhat inaccurate, as total benefits include the major federal benefits of Social Security and Medicaid, which are not means tested.

gains and capital gains realized for tax purposes, which may be subject to mismeasurement and to timing for tax planning. JCT addresses this by relying on dividend income instead of capital gains, although they recognize that dividend income may also be a poor measure insofar as higher income individuals may prefer assets with lower dividend payment rates to better exploit tax planning opportunities for capital gains (Graham and Kumar, 2006). On the other hand, CBO uses dividend income and smoothed capital gains (CBO, 2018a).

However, a better approach to distributing changes in the corporate income tax would use the amount of corporate equity owned instead of taxable income from corporate equity. Therefore, we impute corporate equity ownership using data in the Survey of Consumer Finances (SCF). Using the SCF public-use microdata, we split the sample into five age groups based on the age of the head of household (under 35, 35 – 44, 45 – 54, 55 – 64, 65 – 74, 75 and older). We then further split the sample using income groups nested within the age groups. Because overall income measures in the SCF are not comparable to those based on tax data, we instead construct a "comparable income" measure using income components with comparable definitions across the samples.[4] Because the SCF oversamples high-income households, our income groups apply greater focus to the higher income population; we use the bottom four quintiles, the ninth decile, the next 4 percent, and the top 1 percent within each age group.[5] For each group, we then estimate the share that own corporate equity in any form, the mean and standard deviation of the log of equity conditional on owning equity, and the share of corporate equity held directly (through stocks or equity mutual funds) rather than through tax-preferred saving accounts.[6] Because wealth follows an approximate lognormal distribution, we consider a conditional lognormal distribution reasonable for an equity imputation.

We then split our tax return sample into the same groups. Within each group, we estimate the frequency of returns that we can identify as certainly owning equity (nonzero short-term gain or loss, nonzero long-term gain or loss, or positive dividend income, denoted $e_{i,j}$ for an

[4] The "comparable income" measure is the sum of wage and salary income, farm and pass-through business income, interest income, dividend income, unemployment insurance, Social Security benefits, and pension and annuity income. This excludes capital gain or loss, retirement account withdrawals, most welfare benefits, alimony received (due to underreporting of cash alimony income to the IRS), pension contributions, state and local income tax refunds, and AMT taxable income items.

[5] We collapse the top 1 percent into the income group immediately below it (95th to 99th percentiles) for the youngest age group due to insufficient high-income observations.

[6] All of these equity measures use equity as estimated by the SCF.

individual i in group j, and $\overline{e_j}$ as the group frequency). We can then estimate the probability that an individual filer owns equity using the formula

$$p\_\{i,j\} = \begin{cases} 1 & \text{if } e_{i,j} = 1 \\ \dfrac{p_j - \overline{e_j}}{1 - \overline{e_j}} & \text{if } e_{i,j} = 0 \end{cases}$$

where p_j is the group's frequency of owning corporate equity estimated from SCF data. This probability adjustment maintains the overall frequency of equity ownership within a group. We can then impute the conditional equity amount for each filing unit and the share held in direct form.

For equity held in direct form, we assume that the windfall change resulting from a change in the corporate income tax is distributed to owners as a mix of dividends and capital gains, using the CBO (2014) estimate of the dividend payout rate of 44 percent. CBO (2014) also estimated that of capital gains held in fully taxable form, 3.4 percent are realized as short-term gains, 49.6 percent are realized as long-term gains, and the rest are held until death.[7]
For equity held in tax-preferred accounts, an additional complication arises from the specific rules. Some of these accounts allow for tax deductible contributions and then tax the distributions at ordinary income rates (traditional IRA and 401(k)); this setup exempts the rate of return from tax (in expectation) and may also shift the level of the tax, but they do not exempt a windfall to corporate equity from taxation.[8] Accounts that do not tax withdrawals (Roth IRA, as well as spending-specific accounts such as HSAs and 529s) would not tax the windfall to corporate equity held in these accounts. When doing the equity imputation, we also estimate the fraction of assets in savings accounts that are taxed while in the account or at withdrawal.[9]

Allocating the Corporate Tax Windfall Across Equity Owners

To determine the split in the corporate tax burden, we use data from the Financial Accounts for 2017. Table B3 presents the results, using corporate equity held directly and held

[7] For the portion held until death, there is some ambiguity in how to assess the present value of the tax on a windfall, as the estate tax may apply. However, because we do not have sufficient data to assess whether it may be subject to the estate tax, we omit this from our analysis.
[8] The shift in the level of the tax occurs because tax-deductible contributions typically occur during higher-income years (working years) whereas distributions typically occur in low-income years (retirement).
[9] These accounts are: non-Roth IRAs and Keogh plans; specific spending accounts excluding HSAs, 529 and Coverdell accounts; and defined contribution pension accounts owned by the individual, i.e. 401(k), 403(b), thrift/savings plans, and 457 plans.

through mutual funds. Although the federal government owned $357 billion of corporate equity in 2017, most of that equity ($309 billion) was actually held in defined contribution retirement accounts for federal employees (thrift saving plans), which should be distributed to individuals along with private defined contribution plans. Corporate equity in defined benefit federal retirement funds is treated as owned directly by the federal government. Similarly, corporate equity in defined benefit state and local government retirement funds is also treated as owned directly by those governments. Finally, corporate equity in private defined benefit pension funds is treated as owned by other corporations and netted out of the burden of the corporate income tax. This gives a final allocation of the windfall as presented in Table B4, with 66.9 percent of the windfall going to households, 4.7 percent to nonprofits, 0.1 percent to the federal government, 8.6 percent to state and local governments, 19.7 percent to the rest of the world. These allocations are then distributed as described above.

Main Results

We begin by using the Congressional Budget Office forecast of the change in corporate tax revenue due solely to legislative changes (CBO, 2018b, Table A-1). Note that unlike the JCT estimates, this includes only corporate tax revenue, without the interaction with the tax on the windfall to corporate equity at the level of equity owners. Moreover, the legislative changes do not include any economic effects of the legislation. The changes in corporate tax revenues are shown in Table B5.

Unlike when considering the distribution of the individual income tax provisions, the common tax measures presented are not applicable to a change in the corporate income tax. Because the change in the corporate income tax operates through changes in incomes rather than literal corporate income taxes distributed to individuals and is further offset by changes in federal taxes due to these changes in incomes, the appropriate measure by which to produce a distributional analysis use income after federal taxes.

Tables B6(a) through B6(k) present the percent change and average dollar change in after tax income for each income group (using the rankings in the baseline) under three policy comparisons: the individual income tax changes without the corporate income tax changes, the corporate tax changes without the individual income tax changes, and both the individual and corporate income tax changes. These allow us to observe the relative magnitudes of the

distributed corporates income tax windfalls relative to the individual income tax cuts and the total.

V. Growth Model and the Dynamic Distribution

As discussed in section IV, general equilibrium estimates of the corporate tax burden usually rely on highly stylized models of the corporate tax system. These models include JCT's three models, a neoclassical model, and overlapping generations model and a dynamic stochastic general equilibrium model. Other models include those managed by Tax Policy Center, Tax Foundation and the Congressional Budget Office; the results of these models are reviewed in the introduction to this paper.

Unlike these growth models, our model emphasizes the estimation of the investment incentives in the corporate and noncorporate business taxes. Once these investment incentives are properly modeled along with effective marginal tax rates on labor, we use reduced form estimates of investment and labor elasticities to update aggregate investment and labor supply, with a growth accounting framework that updates GDP, capital income and labor income. We can then pass these growth effects through to individual incomes and perform a distributional analysis of the TCJA in different years in a dynamic context instead of a static distributional analysis.

It is important to acknowledge that our growth accounting model is not a definitive estimate of the growth effects of the TCJA. Because the effects in a growth accounting mode are linearized around an existing equilibrium baseline, it omits some interactions, such as international borrowing and lending and some savings effects. However, it also allows for more precise models of corporate tax structure, such as including different depreciation rules, investment credits, the domestic production deduction and the distortion of net operating loss treatment, that are not well-modeled in traditional dynamic general equilibrium models. In this context, we consider our model a reasonable approach to estimating the effects during the transition following the TCJA's implementation.

Modeling investment responses

To model firm investment incentives, we first identify five factors in determining the investment response: the tax rate, the capital cost recovery schedule, the distortion of the financing decision, special income exclusions, and the difference between net income and taxable income induced by the treatment of net operating losses. For the following equations, we will assume that the investment has a pre-tax rate of return ρ and a depreciation rate of δ, and that the firm has a required after-tax real rate of return r. In the absence of any tax distortion, the firm's gross rent from a unit investment is

$$R^* = -1 + \int_0^\infty (\rho + \delta) e^{-(r+\delta)t} dt = \frac{\rho - r}{r + \delta}$$

In the presence of taxation, the firm has continuous-time net income for tax purposes of

$$(\rho + \delta)\gamma - d_t - f_t$$

where γ is the fraction of the firm's cash flow included in net income, d_t is the tax depreciation rate, and f_t is the continuous-time financing distortion. The present value of the tax on the firm is

$$\int_0^\infty \tau_t \theta \left((\rho + \delta)\gamma e^{-(r+\delta)t} - (d_t + f_t) e^{-(r+\pi)t} \right) dt = (\rho + \delta) \int_0^\infty \tau_t \theta \gamma e^{-(r+\delta)t} dt - A - F$$

where τ_t is the tax rate, θ is the ratio of taxable income to net income in expectation, and π is the inflation rate. We split these tax distortions into the present value of the capital cost recovery deductions (A), the present value of the financing distortion (F), and the present value of the tax on the gross return. Then the after-tax rent is

$$\begin{aligned} R &= -1 + \int_0^\infty (\rho + \delta) e^{-(r+\delta)t} dt - (\rho + \delta) \int_0^\infty \tau_t \theta \gamma e^{-(r+\delta)t} dt + A + F \\ &= -(1 - A - F) + (\rho + \delta) \int_0^\infty (1 - \tau_t \theta \gamma) e^{-(r+\delta)t} dt \end{aligned}$$

We obtain the marginal required pre-tax rate of return p by setting $R = 0$ and solving, which gives

$$p + \delta = \frac{1 - A - F}{\int_0^\infty (1 - \tau_t \theta \gamma) e^{-(r+\delta)t} dt}$$

Note that although p is the cost of capital, the user cost of capital (the component considered relevant to the marginal investment decision) is $p + \delta$. Note that if the tax rate is constant, then this reduces to

$$p + \delta = \frac{1 - A - F}{1 - \tau \theta \gamma} (r + \delta)$$

However, given that the individual income tax changes expire, tax rates cannot be assumed constant.

Capital Cost Recovery

Generally, there are three relevant types of capital cost recovery methods. The standard approach is the Modified Accelerated Cost Recovery System (MACRS), under which an asset's cost can be deducted over several years (using straight-line or declining balance depreciation). Although the cost of intangible investments is recovered through amortization instead of depreciation, the present value of amortization for intangible assets can be evaluated in a similar manner to depreciation of tangible assets. Another often discussed method is expensing, under which an asset's value is immediately deducted. Finally, assets may have their costs recovered through economic depreciation, under which a firm deducts the real change in the value of the asset. Under pre-TCJA law, assets with tax lives of 20 years or less were eligible for bonus depreciation, in which part of the investment is immediately deducted and the rest depreciated.

The present value of expensing is simply 1. This gives a present value of the tax shield from expensing of

$$\text{Expensing:} \quad A = \theta\tau_0$$

where τ_0 is the tax rate at the time of the investment. This result is also useful in the application of bonus depreciation, in which the resulting tax shield is a weighted average of the tax shield from expensing and the tax shield for share of the investment that receives less generous capital cost recovery.

In general, the least valuable type of depreciation is economic depreciation. If the tax rate is constant, then the present value of the tax shield is

$$\text{Economic, constant tax rate:} \quad A = \int_0^\infty \theta\tau\delta e^{-(r+\delta)t}\, dt = \frac{\theta\tau\delta}{r+\delta}$$

Now suppose the tax rate changes at time s from rate τ_0 to τ_1. Then the new tax shield from depreciation is

$$\text{Economic, 2 tax rates:} \quad A = \int_0^s \theta\tau_0\, \delta e^{-(r+\delta)t} dt + \int_s^\infty \theta\tau_1\, \delta e^{-(r+\delta)t} dt$$

$$= \frac{\theta\tau_0\delta}{r+\delta}\left(1 - e^{-(r+\delta)s}\right) + \frac{\theta\tau_1\delta}{r+\delta} e^{-(r+\delta)s} = \frac{\theta\tau_0\delta}{r+\delta} + \frac{\theta\delta}{r+\delta} e^{-(r+\delta)s}(\tau_1 - \tau_0)$$

MACRS depreciation uses a combination of declining balance depreciation and straight-line depreciation. Declining balance depreciation for a tax life of λ begins with exponential depreciation at rate n/λ, where n is the declining balance rate, followed by a switch to straight-line depreciation. The optimal switch occurs at time $t_1 = \lambda\left(1 - \frac{1}{n}\right)$, and the undepreciated balance at that time is e^{1-n}. Between the switching time t_1 and the end of the tax life, the firm uses straight-line depreciation at rate $\frac{1}{\lambda - t_1} = \frac{n}{\lambda}$. The present value of the tax shield from this type of depreciation is

$$\text{MACRS:} \quad A = \int_0^{t_1} \theta\tau_t \frac{n}{\lambda} e^{-\frac{n}{\lambda}t} e^{-(r+\pi)t} dt + \int_{t_1}^{\lambda} \theta\tau_t e^{1-n} \frac{n}{\lambda} e^{-(r+\pi)t}\, dt$$

Note that if $n = 1$, this gives $t_1 = 0$, and this reduces to straight-line depreciation. Unlike expensing or economic depreciation, the present value of MACRS depreciation deductions are sensitive to inflation. If the tax rate is constant, this becomes

MACRS, 1 tax rate:

$$A = \frac{\theta\tau n}{\lambda(r+\pi) + n}\left(1 - e^{1-n-\lambda(r+\pi)+\lambda(r+\pi)/n}\right) + \frac{\theta\tau n}{\lambda(r+\pi)} e^{1-n-\lambda(r+\pi)}\left(e^{\lambda(r+\pi)/n} - 1\right)$$

However, suppose the tax rate is expected to change at time $s < t_1$. Then the present value of the tax shield is

MACRS, 2 tax rates, $s < t_1$

$$\begin{aligned} A = \int_0^{s} \theta\tau_0 \frac{n}{\lambda} e^{-\frac{n}{\lambda}t} e^{-(r+\pi)t}\, dt + \int_{s}^{t_1} \theta\tau_1 \frac{n}{\lambda} e^{-\frac{n}{\lambda}t} e^{-(r+\pi)t}\, dt + \int_{t_1}^{\lambda} \theta\tau_1 e^{1-n} \frac{n}{\lambda} e^{-(r+\pi)t}\, dt \\ = \frac{\theta\tau_0 n}{\lambda(r+\pi) + n}\left(1 - e^{-(r+\pi+n/\lambda)s}\right) \\ + \frac{\theta\tau_1 n}{\lambda(r+\pi) + n}\left(e^{-(r+\pi+n/\lambda)s} - e^{1-n-\lambda(r+\pi)+\lambda(r+\pi)/n}\right) \\ + \frac{\theta\tau_1 n}{\lambda(r+\pi)} e^{1-n-\lambda(r+\pi)}\left(e^{\lambda(r+\pi)/n} - 1\right) \end{aligned}$$

On the other hand, if the tax rate is expected to change at time $s \in (t_1, \lambda)$, then the present value of the tax shield is

$$A = \int_0^{t_1} \theta\tau_0 \frac{n}{\lambda} e^{-\frac{n}{\lambda}t} e^{-(r+\pi)t} dt + \int_{t_1}^{s} \theta\tau_0 e^{1-n} \frac{n}{\lambda} e^{-(r+\pi)t}\, dt + \int_{s}^{\lambda} \theta\tau_1 e^{1-n} \frac{n}{\lambda} e^{-(r+\pi)t}\, dt$$

$$= \frac{\theta\tau_0 n}{\lambda(r+\pi)+n}\left(1 - e^{1-n-\lambda(r+\pi)+\lambda(r+\pi)/n}\right)$$

$$+ \frac{\theta\tau_0 n}{\lambda(r+\pi)} e^{1-n}\left(e^{-\lambda(r+\pi)+\lambda(r+\pi)/n} - e^{-(r+\pi)s}\right)$$

$$+ \frac{\theta\tau_1 n}{\lambda(r+\pi)} e^{1-n}\left(e^{-(r+\pi)s} - e^{-(r+\pi)\lambda}\right)$$

To calculate the present value of MACRS depreciation, we use the half-year convention, under which the asset is treated as placed in service midway through the year and begins depreciating immediately.

When modeling the tax savings from capital cost recovery, an additional complication arises for research and development. Generally, R&D investment is eligible for expensing, and R&D in excess of a defined base is eligible for the research and experimentation credit, which is intended to incentivize increasing research. Due to the complexity of the rules, we use an effective credit rate instead of modeling the credit in its entirety. The present value of the tax savings from R&D cost recovery is $A_{R\&D} = \theta\tau_0(1-c) + c$, where c is the effective credit rate and the amount of the credit reduces the base eligible for expensing. We estimate c using data from the OECD, which produces an index to measure the tax incentive for R&D investment relative to expensing, per the formula $INDEX = \frac{A-\tau}{1-\tau}$.[10] When R&D investment is eligible for expensing and a R&D credit (one that reduces the base eligible for expensing), this simplifies to $INDEX = c$. In recent years, the OECD's estimated values of this index for the U.S. have been 0.03 or 0.04, depending on the type of firm and the year.[11]

Financing Distortion

As in Devereux and Griffith (2003), our financing distortion includes both the tax shield from interest deductibility and the distortion from differential taxation of debt and equity at the

[10] The OECD index's formula is actually $1 - B$, where B is the B-index, which has the formula $B = \frac{1-A}{1-\tau}$. Further explanations can be found in OECD (2018) and JCT (2011).

[11] These estimates of 0.03 and 0.04 apply to all R&D investment, and as such are much lower than estimates from JCT (2011) of a 12 to 15 percent effective rate, which is only for eligible (i.e. increasing beyond its base) R&D investment. These estimates are also lower than the 20 percent statutory rate, or the 14 percent alternative simplified rate.

ownership level. We suppose that a firm chooses a constant debt-to-asset financing ratio Δ. Under pre-TCJA law, the formula for the tax shield from interest deductibility on the marginal investment is

$$\int_0^\infty \Delta i \tau \theta e^{-(r+\delta)t} dt = \frac{\Delta i \tau \theta}{r+\delta}$$

However, the TCJA included two provisions that alter this calculation. The first is that the tax rate is not constant over time for pass-through businesses because of the expiration of the Section 199A exclusion along with the rest of the TCJA's individual income tax provisions. The other change to this structure is the limitation of business interest deductibility, which limits the net interest deduction to 30 percent of adjusted taxable income, with the disallowed portion carried forward.[12] Together, these make the effective payoff to Δ

$$\frac{\widehat{\Delta\imath}\theta\tau_0}{r+\delta} + \frac{\widehat{\Delta\imath}\theta(\tau_1 - \tau_0)}{r+\delta} e^{-(r+\delta)s}$$

where $\widehat{\Delta\imath} = max\{\Delta i, 0.3(p+\delta)\}$.[13] It is important to note that the profit rate that constrains interest deductibility is the firm's overall profit rate. Thus F is not affected by setting the marginal rent to zero and solving for the cost of capital (no second order effects).

In addition to the tax shield from debt, we add a measure of the distortion arising from differential taxation of capital gains, dividends and interest, similar to the approach used in Devereux and Griffith (2003). By the capital market equilibrium condition, the after-tax, risk-adjusted rates on return on debt and equity should be equal. However, because the interest income is taxed more heavily at the ownership level than equity income, debt financing includes a higher required rate of return than would be necessary in the context of equal taxation of debt and equity income. Given the debt-equity financing split, the unit return to investors after-tax is $\Delta(1-\tau_d) + (1-\Delta)(1-\tau_e)$. This produces a unit distortion relative to pure equity financing of $\Delta(\tau_e - \tau_e)$, which has a total present value of $\frac{\Delta(\tau_e - \tau_d)}{r+\delta}$, which is negative when the tax rate on equity income is less than the tax rate on debt income.

Using both these effects, the total financing distortion is

[12] Adjusted taxable income is income before: any gain, loss or deduction not allocable to the business; interest paid or received, net operating loss deductions, depreciation or amortization. In our equations, this is comparable to the gross profit rate $p + \delta$.

[13] Note that this formula omits risk involved in the gross profit rate. A more accurate approach would treat this as a continuously random variable, which would effectively smooth the expected net interest deduction instead of producing a kink at 0.3.

$$F = \frac{\widehat{\Delta\iota}\theta\tau_0}{r+\delta} + \frac{\widehat{\Delta\iota}\theta(\tau_1 - \tau_0)}{r+\delta} e^{-(r+\delta)s} + \frac{\Delta(\tau_e - \tau_d)}{r+\delta}$$

In this case, we need to calculate the effective tax rates on the return to investment at the ownership level. Note that the calculation of these tax rates should fall on the expected return to investment, instead of on a windfall as in the static distribution of the corporate tax burden. For this analysis, we use estimates from CBO (2014), which found that 57.2 percent of corporate equity is held in fully taxable form, 52.3 percent of corporate debt is held in fully taxable form, 76.3 percent of pass-through debt is held in fully taxable form.[14] Using this breakdown for the fully taxable shares and the additional splits of income from corporate equity into dividends, short-term gains, long-terms gains and gains held until death, we can calculate the relevant weighted effective average tax rates on each of these types of returns, with adjustments for taxes on capital gains to make them accrual-effective.

Note that pass-through equity is subject to tax only once. In the formula for F, this appears in τ_0 and τ_1, but $\tau_e = 0$. This implies that if interest income is taxed more heavily than pass-through income, then the financing distortion for pass-through firms can be negative even with full interest deductibility.

Net Operating Loss Distortion

The tax treatment of net operating losses introduces a distortion not accounted for in existing equations for cost of capital, EMTRs and EATRs. These existing equations deal with expected returns, omitting any distortions introduced by risk. If net operating losses are fully refundable, then the tax would be neutral with respect to losses. However, in practice, the tax treatment of net operating losses results introduces a gap between the present value of taxable income and the present value of net income.

Prior to the TCJA, net operating losses could be recouped through carrybacks and carryforwards. In general, carrybacks could offset positive taxable income in the previous two years, allowing effectively immediate refunds for part of the NOL. Any loss in excess of the amount carried back could be carried forward and offset against future taxable income. Although NOLs could only be carried forward for 20 years, this limitation did not have a substantive

[14] Although CBO (2014) splits holdings into fully taxable, tax deferred, and nontaxable forms, we consider the tax-deferred form as having no burden on the expected rate of return.

impact in practice. Because of the time value of money, carrybacks are relatively more valuable than carryforwards.

The TCJA made several changes to the treatment of NOLs. Notably, it eliminated carrybacks (except for losses incurred in farming or property and casualty insurance), and it limited the deductibility of losses carried forward to 80 percent of taxable income (except for property and casualty insurance businesses). It also eliminated the 20-year limit on NOL carryforwards, allowing them to be carried forward indefinitely.

Due to the complexity and variance effects involved in modeling the distortion of non-neutral NOL rules, it is difficult to model NOLs analytically.[15] However, we can measure the distortion through a Monte Carlo simulation.[16] We first assume that the firm faces a nominal discount rate r. For the return generation process, we assume that the firm generates a pre-tax return p, which is normally distributed with mean μ standard deviation σ, and with a first order autocorrelation of the centered return, such that

$$p_t = \mu + \sigma x_t + \rho(p_{t-1} - \mu)$$

where ρ is the AR(1) coefficient and x_t has a standard normal distribution. We obtain our estimates of ρ and σ from Barber and Lyon (1996), which found relatively robust standard deviations of return on assets of approximately 10 percent and first-order autocorrelation of approximately 0.75.

We also assume that the pre-tax net income is proportional to assets, so that net income is $N_t = p_t K_t$. We can then calculate taxable income I_t using the tax rules for NOLs. Note that $\sum_t I_t \geq \sum_t N_t$.

This approach to generating pre-tax net income differs from the more common random walk methods used in the literature. We choose to apply a return-driven approach because this provides more flexibility in generating net income based on existing assets.

To simulate the distortion, we generate returns for 210 years, from $t = -9$ through $t = 200$. We evaluate the present value of taxable and net incomes over the period from $t = 1$ through $t = 200$; the net income generated before the first year allows the use of carrybacks to

[15] This could potentially be modeled using conditional probabilities and repeated numerical integration. However, a simulation approach allows greater flexibility of assumptions.

[16] The simulation's "random" numbers are generated using the inverse transform method applied to a pre-generated set of numbers from the uniform distribution. This ensures that the results do not change with repeated runs using the same input parameters.

take effect immediately, but we do not count it in the present value calculations. We set the value of the capital assets to 1 at $t = 1$, growing at a constant rate. Once the net incomes and taxable incomes have been simulated, we calculate the total present value of each, and we calculate the distortion as the ratio of the average present value of taxable income to the average present value of net income.

The growth path of the capital stock has an additional effect on the distortion of the NOL tax treatment. If the capital stock increases over time, so does expected net income, which increases the value of NOL carryforwards and decreases the value of NOL carrybacks, relative to a zero-growth baseline. Conversely, a declining capital stock decreases the value of carryforwards and increases the value of carrybacks. These scenarios of growing and shrinking capital stocks correspond to analyzing the distortion at the level of the firm and analyzing it at the level of the project.

Table D2 compares the effects of the profit rate and the growth rate assumptions, under pre-TCJA law and the TCJA. The results are generated using 100 simulations of the income generation process. Overall, the TCJA significantly increased the ratio of expected taxable income to expected net income. The difference between these two income measures approximately doubles. Unsurprisingly, both the level of θ and the effect of the TCJA on it are highly sensitive to the profit rate of the firm. Overall, we prefer a 10 percent profit rate for net income for tax purposes, and we use this for our main estimates.

Using this profit rate, a firm asset growth rate of 2 percent, and the standard deviation and autocorrelation estimates from Barber and Lyon (1996), we estimate (using 1000 simulations) a pre-TCJA value of $\theta = 1.0137$ and a post-TCJA value of $\theta = 1.0236$.

Labor Supply Response

We use a relatively simply framework for the labor response. Using Tax-Calculator, we can estimate the effective marginal tax rates on labor income for each earner in each filing unit. We then estimate a labor supply response using the central estimate of the elasticity of taxable income from Saez, Slemrod and Giertz (2012) of 0.25. Because the TCJA's provisions expire, the increased labor response from the TCJA's cut in marginal tax rates is temporary. After 2026, labor supply decreases slightly due to greater bracket creep from chained CPI indexing.

Growth Impact

Using the labor supply elasticity of 0.25, corporate and noncorporate investment elasticities of -1 with respect to the cost of capital, and an elasticity of investment location by multinational enterprises of -3 with respect to the effective average tax rate, we get the increases in GDP during the budget window and in the steady state as shown in table D1. We also plot these results up to 2047 in Figure D1. Although the gap between the reform GDP and baseline GDP decreases in 2026 with the expiration of the individual income tax provisions, the permanent provisions of the corporate income tax reform maintain the new level of GDP above the baseline level.

Dynamic Distributional Impact

Using these growth estimates, we update the distributional effects of the TCJA. We present three example years, 2018, 2023 and 2027, in tables D3(a)-(c). The growth effect is smallest in 2018 because the investment effect has not yet increased productivity, so the only effect occurs through the labor response to marginal tax cuts.

Although the growth effect is smallest in 2018, it is not negligible, causing after-tax incomes to increase by more than $300 on average. The growth effect grows over time, and it changes the interpretation of the distributional analysis after the expiration of the individual income tax provisions. In 2027, the static distributional analysis implies decreases in after-tax income (tax hikes) for nearly all income groups below the top decile. However, once the growth effects of the TCJA are included, our modeling suggests that all income groups are likely to experience modest increases in after-tax income.

V. Conclusion

The Tax Cuts and Jobs Act reformed many provisions in the individual and corporate tax system. While some provisions directly reduced tax liabilities for individuals and businesses, other provisions broadened the base, and yet others are temporary, leading to tax hikes at some point in the future. In this paper, we attempt to provide distributional tables showing the impacts of various provisions on household tax rates and after-tax incomes. For the corporate tax provisions, we model a static as well as a dynamic impact. On net, with the static modeling, we

find that households will face a tax hike by 2027 relative to current law. However, with the dynamic growth that we model as a result of the longer run impacts on investment and incomes, we find that households may face a modest boost in after-tax incomes b 2027. On the individual side, our paper shows distributions by demographic structure of families, and also provides a sensitivity analysis based on weighting and household equivalence scales. We show that the impacts on households vary significantly based on assumptions made.

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Table 1: Summary of Individual Tax Provisions under TCJA (as modeled by Tax Calculator)

Policy	2017 Law	2018 Law
Personal Income Tax Schedule:		
Bracket 1 Upper Threshold:	[$9,325; $18,650; $9,325; $13350; $18,650]	[$9,525; $19,050; $9,525; $13,600; $19,050]
Bracket 1 Rate:	10%	10%
Bracket 2 Upper Threshold:	[$37,950; $75,900; $37,950; $50,800; $75,900]	[$38,700; $77,400; $38,700; $51,800; $77,400]
Bracket 2 Rate:	15%	12%
Bracket 3 Upper Threshold:	[$91,900; $153,100; $76,550; $131,200; $153,100]	[$82,500; $165,000; $82,500; $82,500; $165,000]
Bracket 3 Rate:	25%	22%
Bracket 4 Upper Threshold:	[$191,650; $233,350; $116,675; $212,500; $233,3500]	[$157,500; $315,000; $157,500; $157,500; $315,000]
Bracket 4 Rate:	28%	24%
Bracket 5 Upper Threshold:	[$416,700; $416,700; $208,350; $416,700; $416,700]	[$200,000; $400,000; $200,000; $200,000; $400,000]
Bracket 5 Rate:	33%	32%
Bracket 6 Upper Threshold:	[$418,400; $470,700; $235,350; $444,550; $470,700]	[$500,000; $600,000; $300,000; $500,000; $500,000]
Bracket 6 Rate:	35%	35%
Bracket 7 Upper Threshold:	N/A	N/A
Bracket 7 Rate:	39.6%	37%
Standard Deduction Amount	[$6,350; $12,700; $6,350; $9,350; $12,700]	[$12,000; $24,000; $12,000; $180,00; $24,000]
Personal and Dependent Exemption Amount	$4,050	Eliminated
Child Tax Credit		
Phaseout rate threshold	[$75,000; $110,000; $55,000; $75,000; $75,000]	[$200,000; $400,000; $200,000; $200,000; $400,000]
Maximum credit anount per child (non-refundable)	$1,000	$1,400
Non-refundable credit on top of child tax credit for child dependents	$0	$600
Non-refundable credit on top of child tax credit for non-child dependents	$0	$500
Additional CTC Income Threshold	$3,000	$2,500
Additional Marginal Tax		
Amount of AMT-taxable income exempted from AMT	[$54,300; $84,500; $42,250; $54,300; $84,500]	[$70,300; $109,400; $54,700; $70,300; $109,400]
AMT exemption phaseout threshold	[$120,700; $160,900; $80,450; $120,700; $160,900]	[$500,000; $1,000,000; $500,000; $500,000; $1,000,000]
Amount of Domestic Production Exempt from AGI	0%	100%
Itemized Deductions:		
Pease Limitation	3% phase-out of itemized deductions over certain thresholds	Elimated
Fraction of original total deduction value allowed to be deducted	80%	100%
Ceiling (as fraction of AGI) for all charitable contribution deductions	50%	60%
Casulaty expense deduction	100% deductible	Eliminated
Alimony	Payments 100% deductible; counts as part of taxable income	Deduction eliminated; does not count as part of taxable income
Home Mortgage Interest Indebtedness Threshold	$1,000,000	$750,000
Ceiling on amount of state, local and foregin real estate taxes deduction	N/A	$10,000
Miscellaneous expense deduction	100% deductible for miscellaneous itemized deductions equal to more than 2% of AGI	Eliminated
Medical expenses exceeding this fraction of AGI allowed to be deducted	10% (through 2016; 7.5% through 2017 [retroactive])	7.5%
Cadillac Tax	40% cost of healthcare that exceeds threshold amounts	Eliminated
CPI Indexing	CPI-U	Chained CPI

Table 2: Summary of Business Tax Provisions under Tax Cuts and Jobs Acts

Policy	2017 Law	2018 Law
Top Statatory Corporate Tax Rate	graduated, from 10% - 35%	21% flat rate
Pass-Through Business Income Tax Schedule:		
Bracket 1 Upper Threshold:	[$9,325; $18,650; $9,325; $13350; $18,650]	[$9,525; $19,050; $9,525; $13,600; $19,050]
Bracket 1 Rate:	10%	10%
Bracket 2 Upper Threshold:	[$37,950; $75,900; $37,950; $50,800; $75,900]	[$38,700; $77,400; $38,700; $51,800; $77,400]
Bracket 2 Rate:	15%	12%
Bracket 3 Upper Threshold:	[$91,900; $153,100; $76,550; $131,200; $153,100]	[$82,500; $165,000; $82,500; $82,500; $165,000]
Bracket 3 Rate:	25%	22%
Bracket 4 Upper Threshold:	[$191,650; $233,350; $116,675; $212,500; $233,3500]	[$157,500; $315,000; $157,500; $157,500; $315,000]
Bracket 4 Rate:	28%	24%
Bracket 5 Upper Threshold:	[$416,700; $416,700; $208,350; $416,700; $416,700]	[$200,000; $400,000; $200,000; $200,000; $400,000]
Bracket 5 Rate:	33%	32%
Bracket 6 Upper Threshold:	[$418,400; $470,700; $235,350; $444,550; $470,700]	[$500,000; $600,000; $300,000; $500,000; $500,000]
Bracket 6 Rate:	35%	35%
Bracket 7 Upper Threshold:	N/A	N/A
Bracket 7 Rate:	39.6%	37%
QBI Exemption	0%	20%
Alternative Minimum Tax	Applied to corporations with annual gross receipts greater than $7.5 million in prior 3 years	Eliminated
Bonus Depreciation	50% on new equiptment	100% expensing on new and used equiptment
Section 179 Deduction Limitation Threshold	$510,000	$1,000,000
Section 179 Deduction Phaseout Threshold	$2,050,000	$2,500,000
Entertainment Expenses	Deductible	Deduction Eliminated
Participation Exemption	N/A	Exempts foreign profits of US multinationals from domestic taxation
Foreign Derived Intangible Income (FDII) Provision	N/A	Domestic C-corporations allowed 37.5% deduction of FDII
Global Intangible Low Taxed Income (GILTI) Provision	N/A	Maximum tax on GILTI is 10.5% if foreign tax credits are zero, otherwise equal to 0.105*(GILTI - 0.8)*(foreign tax credits)
Base Erosion Anti-Abuse (BEAT)	N/A	An AMT of 10% on modified taxable income, calculated by disallowing deductibility of payments to certain foregin parties
One-Time Repatriation Tax	N/A	rate of 15.5 % applied to earnings held as cash/cash equivalents; 8% on reinvested earnings; paid over 8 years

Table 3. Distributional Example for Changes to a Progressive Tax System

Baseline		
Income	Tax liability	Tax rate
$10,000	$100	1%
$20,000	$1,000	5%
$50,000	$5,000	10%
$100,000	$15,000	15%
$500,000	$150,000	30%
Total	$171,100	25%

Proportional tax hike (1%)						
	Tax liability		Tax rate		After-tax income (% change)	Share of tax change (%)
Income	New level	Change ($)	New level	Change (pp)		
$10,000	$200	$100	2%	1.0%	-1.01%	1%
$20,000	$1,200	$200	6%	1.0%	-1.05%	3%
$50,000	$5,500	$500	11%	1.0%	-1.11%	7%
$100,000	$16,000	$1,000	16%	1.0%	-1.18%	15%
$500,000	$155,000	$5,000	31%	1.0%	-1.43%	74%
Total	$177,900	$6,800	26%	1.0%	-1.34%	100%

Progressive tax hike (4% increase in tax burden)						
	Tax liability		Tax rate		After-tax income (% change)	Share of tax change (%)
Income	New level	Change ($)	New level	Change (pp)		
$10,000	$104	$4	1%	0.0%	-0.04%	0%
$20,000	$1,040	$40	5%	0.2%	-0.21%	1%
$50,000	$5,200	$200	10%	0.4%	-0.44%	3%
$100,000	$15,600	$600	16%	0.6%	-0.71%	9%
$500,000	$156,000	$6,000	31%	1.2%	-1.71%	88%
Total	$177,944	$6,844	26%	1.0%	-1.34%	100%

Regressive tax hike (1.35% tax on after-tax income)						
	Tax liability		Tax rate		After-tax income (% change)	Share of tax change (%)
Income	New level	Change ($)	New level	Change (pp)		
$10,000	$234	$134	2%	1.3%	-1.4%	2%
$20,000	$1,257	$257	6%	1.3%	-1.4%	4%
$50,000	$5,608	$608	11%	1.2%	-1.4%	9%
$100,000	$16,148	$1,148	16%	1.1%	-1.4%	17%
$500,000	$154,725	$4,725	31%	0.9%	-1.4%	69%
Total	$177,970	$6,870	26%	1.0%	-1.35%	100%

Table 4(a)(i). Distribution of Tax Burden Levels in 2018

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.90	-1.17	-0.01	-0.02	98.28	98.33
Second decile	-7.46	-8.17	-0.51	-0.59	89.19	98.50
Third decile	0.76	-0.64	0.08	-0.08	75.62	83.17
Fourth decile	7.19	5.71	1.16	0.98	67.87	70.45
Fifth decile	11.02	9.77	2.45	2.32	45.33	54.99
Sixth decile	13.44	12.19	4.03	3.90	16.39	23.41
Seventh decile	16.23	14.89	6.45	6.32	4.27	4.78
Eighth decile	19.25	17.85	10.41	10.30	1.33	1.21
Ninth decile	22.07	20.69	17.02	17.04	0.71	0.63
Next 5%	23.72	22.38	13.20	13.29	0.67	0.58
Next 4%	24.94	22.89	19.54	19.14	0.41	0.47
Top 1%	27.37	26.77	25.98	27.13	0.34	0.30
All units	20.74	19.43	100	100	40.32	43.94

Table 4(a)(ii). Distribution of Tax Burden Changes in 2018

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.27	-7	0.07	7.94	0.68
Second decile	0.66	-81	0.77	42.99	11.51
Third decile	1.41	-263	2.47	59.78	7.09
Fourth decile	1.60	-402	3.79	60.37	3.11
Fifth decile	1.40	-465	4.38	67.00	4.30
Sixth decile	1.45	-631	5.94	80.90	7.71
Seventh decile	1.60	-894	8.42	87.57	9.71
Eighth decile	1.74	-1279	12.04	88.75	10.37
Ninth decile	1.77	-1786	16.82	87.38	12.13
Next 5%	1.75	-2501	11.77	85.63	13.86
Next 4%	2.72	-6721	25.32	89.70	9.90
Top 1%	0.83	-9585	9.02	76.08	23.63
All units	1.65	-1054	100.00	66.49	7.97

Table 4(b)(i). Distribution of Tax Burden Levels in 2019

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.76	-1.02	-0.01	-0.02	98.22	98.27
Second decile	-7.44	-8.16	-0.51	-0.59	89.16	98.57
Third decile	1.00	-0.39	0.11	-0.05	75.30	82.77
Fourth decile	7.23	5.82	1.17	1.01	68.07	70.50
Fifth decile	11.07	9.86	2.47	2.35	44.84	54.59
Sixth decile	13.39	12.17	4.02	3.90	16.16	22.36
Seventh decile	16.17	14.86	6.44	6.31	4.25	4.94
Eighth decile	19.28	17.89	10.46	10.34	1.35	1.33
Ninth decile	22.09	20.77	17.12	17.14	0.68	0.55
Next 5%	23.73	22.45	13.23	13.33	0.70	0.69
Next 4%	24.98	23.03	19.60	19.25	0.41	0.54
Top 1%	27.29	26.73	25.69	26.79	0.32	0.30
All units	20.72	19.45	100	100	40.22	43.78

Table 4(b)(ii). Distribution of Tax Burden Changes in 2019

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.25	-7	0.07	7.91	0.77
Second decile	0.67	-84	0.81	43.05	11.54
Third decile	1.40	-267	2.55	59.55	7.02
Fourth decile	1.52	-393	3.75	59.65	3.17
Fifth decile	1.36	-464	4.43	66.68	4.35
Sixth decile	1.41	-631	6.02	80.51	8.16
Seventh decile	1.56	-897	8.56	86.78	10.47
Eighth decile	1.72	-1292	12.33	87.52	11.69
Ninth decile	1.70	-1764	16.83	85.97	13.56
Next 5%	1.67	-2444	11.66	83.77	15.71
Next 4%	2.60	-6576	25.10	87.95	11.65
Top 1%	0.78	-9130	8.71	75.11	24.62
All units	1.59	-1040	100.00	65.83	8.55

Table 4(c)(i). Distribution of Tax Burden Levels in 2020

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.70	-0.92	-0.01	-0.02	98.16	98.24
Second decile	-7.33	-8.07	-0.51	-0.59	88.96	98.54
Third decile	1.22	-0.13	0.14	-0.02	74.94	82.17
Fourth decile	7.31	5.97	1.19	1.04	68.21	70.48
Fifth decile	11.04	9.89	2.48	2.36	44.46	53.92
Sixth decile	13.36	12.18	4.03	3.91	15.91	21.46
Seventh decile	16.13	14.84	6.44	6.30	4.11	4.87
Eighth decile	19.29	17.92	10.49	10.36	1.34	1.29
Ninth decile	22.08	20.80	17.15	17.18	0.65	0.59
Next 5%	23.69	22.47	13.22	13.33	0.65	0.64
Next 4%	24.98	23.07	19.64	19.28	0.45	0.61
Top 1%	27.19	26.65	25.54	26.62	0.32	0.31
All units	20.67	19.45	100	100	40.09	43.55

Table 4(c)(ii). Distribution of Tax Burden Changes in 2020

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.22	-6	0.06	8.09	0.78
Second decile	0.69	-89	0.86	42.68	12.27
Third decile	1.37	-268	2.57	58.87	7.34
Fourth decile	1.44	-383	3.67	59.01	3.25
Fifth decile	1.29	-454	4.35	66.10	4.50
Sixth decile	1.36	-626	6.00	80.29	8.52
Seventh decile	1.53	-903	8.66	86.76	10.58
Eighth decile	1.70	-1309	12.55	87.07	12.13
Ninth decile	1.64	-1747	16.74	85.40	14.13
Next 5%	1.61	-2407	11.54	83.34	16.21
Next 4%	2.55	-6610	25.34	87.65	11.91
Top 1%	0.74	-8841	8.48	74.46	25.26
All units	1.55	-1036	100.00	65.46	8.87

Table 4(d)(i). Distribution of Tax Burden Levels in 2021

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.67	-0.91	-0.01	-0.02	98.18	98.25
Second decile	-7.21	-7.95	-0.50	-0.59	88.66	98.48
Third decile	1.42	0.11	0.16	0.01	74.87	81.67
Fourth decile	7.34	6.08	1.20	1.06	68.43	70.62
Fifth decile	11.07	9.96	2.49	2.38	43.93	52.81
Sixth decile	13.31	12.17	4.03	3.91	15.55	20.66
Seventh decile	16.12	14.86	6.45	6.31	3.98	4.69
Eighth decile	19.28	17.93	10.51	10.37	1.37	1.31
Ninth decile	22.08	20.84	17.19	17.22	0.67	0.59
Next 5%	23.69	22.51	13.22	13.33	0.64	0.63
Next 4%	24.94	23.07	19.63	19.27	0.49	0.64
Top 1%	27.11	26.60	25.44	26.50	0.32	0.31
All units	20.64	19.45	100	100	39.97	43.30

Table 4(d)(ii). Distribution of Tax Burden Changes in 2021

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.24	-7	0.07	8.24	0.79
Second decile	0.69	-92	0.89	42.90	12.49
Third decile	1.33	-267	2.57	58.63	7.13
Fourth decile	1.36	-373	3.58	58.23	3.35
Fifth decile	1.25	-449	4.31	65.71	4.71
Sixth decile	1.32	-624	5.99	80.37	8.71
Seventh decile	1.50	-910	8.74	86.52	10.89
Eighth decile	1.67	-1327	12.74	86.50	12.64
Ninth decile	1.59	-1737	16.68	84.84	14.70
Next 5%	1.56	-2388	11.47	82.50	17.09
Next 4%	2.49	-6640	25.51	87.21	12.30
Top 1%	0.70	-8620	8.28	73.72	26.00
All units	1.50	-1034	100.00	65.16	9.12

Table 4(e)(i). Distribution of Tax Burden Levels in 2022

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.40	-0.65	-0.01	-0.01	98.16	98.23
Second decile	-7.09	-7.94	-0.49	-0.59	88.45	98.44
Third decile	1.65	0.21	0.19	0.02	74.60	81.04
Fourth decile	7.39	6.16	1.22	1.07	68.64	70.88
Fifth decile	11.09	10.02	2.50	2.39	43.60	52.22
Sixth decile	13.27	12.16	4.02	3.90	15.16	19.66
Seventh decile	16.13	14.89	6.45	6.31	3.86	4.53
Eighth decile	19.33	17.99	10.54	10.40	1.33	1.29
Ninth decile	22.11	20.91	17.22	17.27	0.64	0.57
Next 5%	23.69	22.53	13.21	13.33	0.64	0.57
Next 4%	24.93	23.09	19.62	19.27	0.48	0.69
Top 1%	27.05	26.56	25.35	26.39	0.34	0.31
All units	20.64	19.47	100	100	39.85	43.08

Table 4(e)(ii). Distribution of Tax Burden Changes in 2022

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.24	-7	0.07	8.26	0.83
Second decile	0.79	-109	1.04	40.95	14.77
Third decile	1.47	-303	2.89	58.35	6.88
Fourth decile	1.33	-377	3.59	57.72	3.42
Fifth decile	1.20	-446	4.24	65.36	4.81
Sixth decile	1.28	-625	5.95	80.50	8.99
Seventh decile	1.48	-919	8.75	86.43	11.03
Eighth decile	1.66	-1351	12.87	86.31	12.83
Ninth decile	1.53	-1724	16.42	84.29	15.28
Next 5%	1.51	-2384	11.36	82.00	17.59
Next 4%	2.45	-6713	25.58	86.66	12.85
Top 1%	0.67	-8457	8.06	73.18	26.55
All units	1.47	-1042	100.00	64.74	9.51

Table 4(f)(i). Distribution of Tax Burden Levels in 2023

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.56	-0.83	-0.01	-0.01	98.15	98.22
Second decile	-6.85	-7.72	-0.48	-0.57	87.93	98.40
Third decile	1.90	0.50	0.22	0.06	74.38	80.11
Fourth decile	7.49	6.33	1.23	1.10	68.72	70.88
Fifth decile	11.07	10.05	2.49	2.39	43.05	51.48
Sixth decile	13.30	12.22	4.03	3.91	14.63	18.74
Seventh decile	16.14	14.91	6.44	6.30	3.76	4.25
Eighth decile	19.35	18.04	10.54	10.40	1.32	1.29
Ninth decile	22.12	20.97	17.21	17.27	0.60	0.55
Next 5%	23.72	22.59	13.22	13.32	0.65	0.60
Next 4%	24.96	23.15	19.64	19.28	0.48	0.65
Top 1%	27.02	26.54	25.29	26.30	0.33	0.30
All units	20.66	19.52	100	100	39.66	42.79

Table 4(f)(ii). Distribution of Tax Burden Changes in 2023

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.27	-9	0.08	8.50	0.83
Second decile	0.81	-116	1.10	41.93	14.53
Third decile	1.42	-302	2.87	58.19	6.61
Fourth decile	1.25	-364	3.45	57.16	3.48
Fifth decile	1.15	-440	4.17	64.97	4.94
Sixth decile	1.25	-629	5.96	80.67	9.10
Seventh decile	1.46	-934	8.85	86.29	11.20
Eighth decile	1.63	-1372	13.00	85.81	13.33
Ninth decile	1.48	-1712	16.22	83.71	15.86
Next 5%	1.48	-2398	11.36	81.60	17.96
Next 4%	2.41	-6801	25.78	86.09	13.45
Top 1%	0.64	-8416	7.97	72.77	26.97
All units	1.44	-1048	100.00	64.60	9.67

Table 4(g)(i). Distribution of Tax Burden Levels in 2024

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.43	-0.70	-0.01	-0.01	98.09	98.13
Second decile	-6.69	-7.57	-0.47	-0.56	87.69	98.41
Third decile	2.10	0.74	0.24	0.09	74.20	79.45
Fourth decile	7.58	6.49	1.25	1.13	68.78	70.89
Fifth decile	11.10	10.11	2.49	2.40	42.21	50.58
Sixth decile	13.30	12.24	4.02	3.91	14.05	17.71
Seventh decile	16.19	14.98	6.46	6.32	3.43	3.93
Eighth decile	19.39	18.09	10.55	10.40	1.52	1.50
Ninth decile	22.15	21.04	17.22	17.29	0.61	0.55
Next 5%	23.75	22.66	13.22	13.33	0.67	0.62
Next 4%	24.98	23.20	19.62	19.26	0.51	0.68
Top 1%	26.99	26.54	25.21	26.20	0.33	0.31
All units	20.68	19.57	100	100	39.47	42.51

Table 4(g)(ii). Distribution of Tax Burden Changes in 2024

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.28	-9	0.09	8.52	0.89
Second decile	0.82	-122	1.15	42.45	14.56
Third decile	1.40	-306	2.88	57.98	6.49
Fourth decile	1.18	-353	3.33	56.75	3.52
Fifth decile	1.10	-435	4.10	64.76	5.08
Sixth decile	1.22	-630	5.94	80.79	9.26
Seventh decile	1.45	-954	8.99	86.42	11.37
Eighth decile	1.61	-1391	13.11	85.27	13.65
Ninth decile	1.42	-1701	16.03	82.84	16.72
Next 5%	1.44	-2411	11.36	81.17	18.37
Next 4%	2.37	-6898	25.99	85.45	14.06
Top 1%	0.62	-8352	7.87	72.21	27.52
All units	1.40	-1054	100.00	64.40	9.88

Table 4(h)(i). Distribution of Tax Burden Levels in 2025

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.51	-0.79	-0.01	-0.01	98.01	98.07
Second decile	-6.48	-7.48	-0.46	-0.56	87.28	98.34
Third decile	2.33	0.89	0.26	0.11	74.13	78.96
Fourth decile	7.69	6.65	1.27	1.16	68.55	70.66
Fifth decile	11.09	10.14	2.49	2.40	41.50	49.60
Sixth decile	13.29	12.25	4.01	3.91	13.80	17.01
Seventh decile	16.23	15.02	6.46	6.31	3.26	3.78
Eighth decile	19.42	18.14	10.54	10.40	1.53	1.47
Ninth decile	22.18	21.11	17.22	17.30	0.60	0.55
Next 5%	23.79	22.72	13.23	13.33	0.65	0.61
Next 4%	25.02	23.27	19.64	19.28	0.55	0.65
Top 1%	26.98	26.53	25.16	26.13	0.33	0.31
All units	20.70	19.61	100	100	39.28	42.24

Table 4(h)(ii). Distribution of Tax Burden Changes in 2025

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	0.28	-10	0.09	8.85	0.91
Second decile	0.93	-143	1.33	43.06	14.64
Third decile	1.47	-332	3.09	57.54	6.44
Fourth decile	1.13	-348	3.24	56.21	3.61
Fifth decile	1.07	-433	4.03	64.58	5.29
Sixth decile	1.19	-635	5.92	80.69	9.56
Seventh decile	1.44	-977	9.11	86.46	11.44
Eighth decile	1.58	-1407	13.11	84.75	14.17
Ninth decile	1.37	-1686	15.71	82.34	17.22
Next 5%	1.41	-2427	11.31	80.73	18.82
Next 4%	2.34	-6999	26.09	85.01	14.45
Top 1%	0.61	-8382	7.81	71.82	27.92
All units	1.38	-1065	100.00	64.23	10.09

Table 4(j)(i). Distribution of Tax Burden Levels in 2026

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.51	-0.49	-0.01	-0.01	97.95	97.94
Second decile	-6.28	-6.01	-0.44	-0.42	86.99	86.06
Third decile	2.52	2.83	0.29	0.32	74.05	73.51
Fourth decile	7.77	8.02	1.28	1.31	68.43	67.83
Fifth decile	11.12	11.27	2.49	2.51	40.63	39.20
Sixth decile	13.29	13.39	4.00	4.01	13.47	12.95
Seventh decile	16.25	16.37	6.46	6.46	3.14	2.98
Eighth decile	19.48	19.64	10.57	10.58	1.52	1.51
Ninth decile	22.20	22.37	17.22	17.23	0.57	0.57
Next 5%	23.80	23.96	13.21	13.21	0.65	0.63
Next 4%	25.05	25.21	19.64	19.64	0.57	0.57
Top 1%	26.95	27.00	25.11	24.98	0.34	0.34
All units	20.73	20.87	100	100	39.09	38.68

Table 4(j)(ii). Distribution of Tax Burden Changes in 2026

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	-0.02	1	0.05	0.00	1.51
Second decile	-0.26	40	2.80	0.00	49.92
Third decile	-0.33	76	5.25	0.00	61.22
Fourth decile	-0.26	84	5.85	0.00	58.75
Fifth decile	-0.16	67	4.65	0.00	69.21
Sixth decile	-0.12	66	4.58	0.00	89.73
Seventh decile	-0.14	97	6.77	0.00	97.58
Eighth decile	-0.20	182	12.63	0.00	98.61
Ninth decile	-0.21	269	18.68	0.00	99.42
Next 5%	-0.21	374	12.99	0.00	99.41
Next 4%	-0.22	668	18.57	0.01	99.29
Top 1%	-0.07	1012	7.03	0.50	99.04
All units	-0.18	143	100.00	0.01	72.10

Table 4(k)(i). Distribution of Tax Burden Levels in 2027

	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	-0.49	-0.46	-0.01	-0.01	97.92	97.91
Second decile	-6.08	-5.77	-0.43	-0.40	86.64	85.69
Third decile	2.70	3.05	0.31	0.34	73.91	73.32
Fourth decile	7.87	8.13	1.29	1.33	68.28	67.36
Fifth decile	11.16	11.32	2.50	2.52	39.76	38.33
Sixth decile	13.27	13.39	4.00	4.00	13.15	12.71
Seventh decile	16.29	16.42	6.46	6.46	3.08	2.93
Eighth decile	19.52	19.69	10.57	10.59	1.50	1.43
Ninth decile	22.23	22.41	17.22	17.23	0.58	0.57
Next 5%	23.83	24.01	13.21	13.21	0.65	0.61
Next 4%	25.10	25.28	19.65	19.64	0.59	0.58
Top 1%	26.93	26.99	25.06	24.92	0.33	0.33
All units	20.76	20.92	100	100	38.90	38.45

Table 4(k)(ii). Distribution of Tax Burden Changes in 2027

Income group	Change in after-tax income (%)	Average tax change ($)	Share of tax change (%)	Share with tax cut (%)	Share with tax hike (%)
Bottom decile	-0.02	1	0.05	0.00	1.53
Second decile	-0.29	47	2.86	0.00	50.89
Third decile	-0.36	86	5.24	0.00	61.09
Fourth decile	-0.29	95	5.78	0.00	58.46
Fifth decile	-0.17	74	4.53	0.00	69.35
Sixth decile	-0.13	75	4.57	0.00	89.93
Seventh decile	-0.16	113	6.89	0.00	97.60
Eighth decile	-0.22	209	12.72	0.00	98.68
Ninth decile	-0.24	307	18.68	0.00	99.43
Next 5%	-0.23	429	13.03	0.00	99.43
Next 4%	-0.24	761	18.51	0.04	99.26
Top 1%	-0.08	1152	7.00	0.43	98.96
All units	-0.20	163	100.00	0.01	72.19

Table 5. Distributional Implications of Different Equivalence Scales, 2018

	No scale		Tax unit size		Square root		Oxford	
Income group	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA	2017 law	TCJA
Bottom decile	4.0	3.8	-11.7	-12.2	-0.9	-1.2	-4.7	-5.1
Second decile	0.7	0.0	-7.7	-9.0	-7.5	-8.2	-8.6	-9.4
Third decile	0.5	-0.3	5.4	3.4	0.8	-0.6	2.3	0.6
Fourth decile	5.5	4.4	10.6	9.1	7.2	5.7	8.5	7.0
Fifth decile	10.1	8.8	13.0	11.8	11.0	9.8	11.5	10.2
Sixth decile	13.2	11.8	15.1	14.0	13.4	12.2	14.0	12.8
Seventh decile	16.2	14.8	17.9	16.6	16.2	14.9	16.9	15.6
Eighth decile	18.8	17.4	19.9	18.5	19.3	17.8	19.6	18.2
Ninth decile	21.3	19.9	22.2	20.7	22.1	20.7	22.2	20.8
Next 5%	23.2	21.9	23.9	22.3	23.7	22.4	23.9	22.4
Next 4%	24.7	22.7	25.0	23.2	24.9	22.9	25.0	23.1
Top 1%	27.7	27.0	27.1	26.7	27.4	26.8	27.3	26.7
All units	20.7	19.4	20.7	19.4	20.7	19.4	20.7	19.4

Notes: All results use no weighting, use expanded income as the preferred income measure, and exclude units with negative income.

Table 6. Kakwani Index and Sensitivity of the Progressivity Assessment

	2018	2020	2022	2024	2026
Using our preferred decisions					
Main estimates	0.0013	0.0042	0.0095	0.0076	-0.0898
Using different equivalence scales					
None	-0.0205	-0.0165	-0.0106	-0.0109	-0.0669
Size of tax unit	0.0299	0.0315	0.0354	0.0317	-0.1150
Oxford	0.0116	0.0139	0.0186	0.0160	-0.0987
OECD-modified	0.0018	0.0045	0.0096	0.0077	-0.0894
Using different weighting systems					
Size of tax unit	0.0186	0.0191	0.0245	0.0214	-0.1359
Square root of size	0.0098	0.0113	0.0166	0.0140	-0.1144
Number of adults	-0.0017	-0.0010	0.0028	-0.0001	-0.0965
Using different income measures					
AGI	0.0136	0.0157	0.0205	0.0191	-0.0953
Market income	0.0261	0.0306	0.0373	0.0379	-0.1170
Excluding different groups					
Dependents	-0.0005	0.0021	0.0072	0.0047	-0.0971
Incomplete units	-0.0019	0.0006	0.0058	0.0033	-0.0970
Tax > Income	0.0010	0.0040	0.0092	0.0072	-0.0895

Notes: This table presents the effect on the Kakwani index of changing the assumptions used our preferred analysis. A positive Kakwani value denotes a progressive tax change, and a negative value denotes a regressive tax change. Note that market income is defined as expanded income less government benefits.

Table 7(a). Distribution for married couples filing jointly, 2018

Income group	Percent of filers	Avg tax rate, pre (%)	Avg tax rate, post (%)	Average tax change ($)
Bottom decile	2.2	4.13	3.32	-12
Second decile	2.2	-4.39	-4.82	-45
Third decile	3.2	-5.17	-5.72	-98
Fourth decile	5.4	-0.45	-1.09	-168
Fifth decile	6.8	3.64	2.78	-310
Sixth decile	9.0	6.76	5.80	-467
Seventh decile	11.7	11.39	10.24	-746
Eighth decile	15.2	15.86	14.40	-1302
Ninth decile	20.1	20.05	18.62	-1889
Next 5%	11.6	23.05	21.74	-2561
Next 4%	9.5	24.87	22.53	-7921
Top 1%	2.4	27.91	27.00	-14503
All units	100	22.01	20.57	-2121

Table 7(b). Distribution for unmarried filers, 2018

Income group	Percent of filers	Avg tax rate, pre (%)	Avg tax rate, post (%)	Average tax change ($)
Bottom decile	14.3	3.82	3.71	-3
Second decile	14.3	1.04	0.35	-72
Third decile	13.7	1.03	0.18	-150
Fourth decile	12.4	6.77	5.63	-292
Fifth decile	11.6	12.05	10.59	-521
Sixth decile	10.4	16.07	14.51	-752
Seventh decile	8.8	19.66	18.06	-1030
Eighth decile	6.9	22.18	20.83	-1181
Ninth decile	4.3	24.40	23.26	-1461
Next 5%	1.3	23.92	22.84	-2074
Next 4%	0.9	23.81	23.33	-1636
Top 1%	0.2	26.41	26.71	5027
All units	100	18.07	16.97	-469

Table 8(a). Distribution for filers with no children, 2018

Income group	Percent of filers	Avg tax rate, pre (%)	Avg tax rate, post (%)	Average tax change ($)
Bottom decile	10.7	5.02	4.97	-1
Second decile	10.6	5.39	4.85	-56
Third decile	9.9	6.86	6.24	-108
Fourth decile	10.2	8.87	8.22	-169
Fifth decile	10.4	11.50	10.64	-306
Sixth decile	10.5	13.36	12.35	-487
Seventh decile	10.5	16.20	15.01	-766
Eighth decile	10.0	18.78	17.54	-1092
Ninth decile	8.7	21.13	19.88	-1617
Next 5%	3.8	22.55	21.38	-2267
Next 4%	3.1	23.40	21.69	-5848
Top 1%	0.8	25.86	25.35	-8252
All units	100	19.88	18.79	-772

Table 8(b). Distribution for filers with 1 child, 2018

Income group	Percent of filers	Avg tax rate, pre (%)	Avg tax rate, post (%)	Average tax change ($)
Bottom decile	12.4	3.72	3.46	-7
Second decile	11.7	-8.69	-9.78	-115
Third decile	10.7	-6.53	-8.07	-270
Fourth decile	9.1	2.54	0.68	-480
Fifth decile	8.5	9.59	7.58	-714
Sixth decile	8.1	14.80	12.90	-920
Seventh decile	8.5	17.68	16.02	-1071
Eighth decile	8.8	20.02	18.44	-1401
Ninth decile	10.7	22.48	21.05	-1875
Next 5%	5.9	24.21	22.94	-2467
Next 4%	4.1	26.07	23.92	-7225
Top 1%	0.9	29.51	28.61	-15943
All units	100	21.73	20.23	-1216

Table 8(c). Distribution for filers with 2 children, 2018

Income group	Percent of filers	Avg tax rate, pre (%)	Avg tax rate, post (%)	Average tax change ($)
Bottom decile	3.4	-10.97	-12.41	-28
Second decile	5.0	-23.30	-24.10	-88
Third decile	10.3	-22.08	-23.02	-169
Fourth decile	9.8	-8.02	-10.41	-608
Fifth decile	8.8	4.03	1.12	-1039
Sixth decile	8.5	11.25	8.67	-1235
Seventh decile	8.5	15.48	13.24	-1448
Eighth decile	10.4	18.14	16.27	-1672
Ninth decile	15.0	21.19	19.64	-2063
Next 5%	9.9	23.98	22.54	-2803
Next 4%	8.0	26.64	24.08	-8558
Top 1%	1.9	29.98	28.87	-16325
All units	100	22.30	20.50	-2151

Table 8(d). Distribution for filers with 3 or more children

Income group	Percent of filers	Avg tax rate, pre (%)	Avg tax rate, post (%)	Average tax change ($)
Bottom decile	3.2	-21.26	-22.46	-25
Second decile	3.5	-21.92	-22.75	-89
Third decile	7.0	-25.03	-25.76	-129
Fourth decile	9.6	-10.30	-11.71	-371
Fifth decile	10.9	0.86	-2.38	-1141
Sixth decile	10.5	8.58	5.33	-1574
Seventh decile	9.3	13.31	10.64	-1708
Eighth decile	10.9	16.32	14.12	-1976
Ninth decile	15.1	19.80	18.17	-2168
Next 5%	9.1	23.52	21.74	-3463
Next 4%	8.0	25.97	22.98	-10097
Top 1%	2.4	30.69	29.99	-12315
All units	100	22.67	20.85	-2441

Table B1. Distribution of Nonprofit Windfall Under Different Assumptions

Income groups	Reduced services	Reduced compensation	More giving	Preferred mix
Bottom decile	1.0%	0.3%	2.2%	0.4%
Second decile	3.6%	1.3%	2.4%	1.3%
Third decile	7.7%	2.3%	2.7%	2.5%
Fourth decile	12.2%	3.3%	3.1%	3.6%
Fifth decile	14.3%	4.6%	3.9%	4.9%
Sixth decile	15.0%	6.2%	5.4%	6.5%
Seventh decile	13.6%	8.7%	7.2%	8.9%
Eighth decile	11.6%	12.6%	10.3%	12.6%
Ninth decile	10.1%	18.7%	14.4%	18.4%
Next 5%	4.6%	13.3%	11.0%	13.0%
Next 4%	4.1%	16.8%	14.5%	16.4%
Top 1%	1.4%	11.7%	22.1%	11.4%

Table B2. Distribution of State and Local Government Windfall Under Different Assumptions

Income groups	Increase Medicaid spending	Increase compensation	Reduce taxes
Bottom decile	1.0%	0.3%	3.1%
Second decile	3.6%	1.3%	3.5%
Third decile	7.7%	2.3%	3.7%
Fourth decile	12.2%	3.3%	4.0%
Fifth decile	14.3%	4.6%	4.7%
Sixth decile	15.0%	6.2%	5.4%
Seventh decile	13.6%	8.7%	6.8%
Eighth decile	11.6%	12.6%	9.2%
Ninth decile	10.1%	18.7%	14.3%
Next 5%	4.6%	13.3%	11.1%
Next 4%	4.1%	16.8%	16.5%
Top 1%	1.4%	11.7%	17.1%

Table B3. Corporate Equity Ownership, 2017

	Held directly ($B)	Through mutual funds ($B)	Total ($B)	Share
Households	16394	5387	21780	54.25%
Nonprofits	1376	452	1828	4.55%
Federal gov't, direct	33	0	33	0.08%
Federal gov't, DB retirement funds	16	0	16	0.04%
Federal gov't, DC retirement funds	309	0	309	0.77%

State/local gov'ts, direct	217	72	290	0.72%
State/local gov'ts, DB retirement funds	2677	344	3022	7.53%
Private pensions, DB	1248	292	1539	3.83%
Private pensions, DC	1420	2317	3737	9.31%
Rest of the world	7037	557	7594	18.92%

Source: Financial Accounts of the United States, Table L.223, L.224, L.118.b, L118.c, L119.b, L119.c, B.101h, B101.n, and authors' calculations.

Table B4. Final Allocation of the Corporate Tax Windfall by Type of Equity Owner

Type of equity owner	Windfall share
Households	66.89%
Nonprofits	4.73%
Federal gov't	0.13%
State/local gov'ts	8.58%
Rest of the world	19.67%

Table B5. Change in Corporate Tax Revenue ($Billions)

Type of change	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Legislative	-94.4	-95.8	-79.9	-57.0	-31.9	-7.4	9.8	14.1	-9.0	-57.6
Economic	44.8	72.9	65.5	57.3	47.7	40.3	36.6	37.0	36.8	37.4
Technical	-32.1	-44.6	-58.6	-56.4	-52.5	-40.0	-30.8	-20.2	-6.7	8.9
Total	-81.6	-67.6	-73.0	-56.0	-36.7	-7.1	15.5	31.0	21.1	-11.3

Source: Table A-1 in Congressional Budget Office, “Budget and Economic Outlook and Updates,” April 2018.

Table B6(a). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2018

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.27%	7.0	0.28%	7.5	0.55%	14.5
Second decile	0.66%	81.3	0.14%	17.6	0.81%	99.2
Third decile	1.41%	262.8	0.15%	28.3	1.57%	292.1
Fourth decile	1.60%	402.1	0.21%	52.7	1.81%	455.7
Fifth decile	1.40%	465.2	0.25%	82.4	1.65%	549.2
Sixth decile	1.45%	631.0	0.28%	122.4	1.74%	756.2
Seventh decile	1.60%	893.9	0.30%	170.3	1.91%	1069.3
Eighth decile	1.74%	1278.9	0.36%	266.4	2.12%	1554.1
Ninth decile	1.77%	1786.4	0.43%	434.0	2.21%	2234.3
Next 5%	1.75%	2501.3	0.60%	852.7	2.37%	3388.8
Next 4%	2.72%	6721.4	0.98%	2430.1	3.75%	9262.9
Top 1%	0.83%	9585.0	0.72%	8289.8	1.56%	18029.4
All units	1.65%	1054.1	0.53%	340.2	2.21%	1405.4

Table B6(b). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2019

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.25%	6.9	0.29%	7.8	0.54%	14.6
Second decile	0.67%	84.4	0.13%	16.1	0.80%	100.9
Third decile	1.40%	266.9	0.15%	29.5	1.56%	297.4
Fourth decile	1.52%	392.7	0.20%	52.4	1.72%	445.9
Fifth decile	1.36%	464.2	0.24%	82.7	1.61%	548.6
Sixth decile	1.41%	630.7	0.27%	121.7	1.69%	755.3
Seventh decile	1.56%	896.7	0.30%	170.7	1.87%	1072.7
Eighth decile	1.72%	1292.1	0.35%	262.8	2.08%	1563.8
Ninth decile	1.70%	1764.1	0.42%	435.5	2.13%	2212.9
Next 5%	1.67%	2444.1	0.58%	849.6	2.28%	3328.5
Next 4%	2.60%	6576.3	0.96%	2434.1	3.61%	9119.8
Top 1%	0.78%	9130.3	0.71%	8328.7	1.50%	17611.5
All units	1.59%	1040.3	0.52%	340.3	2.13%	1391.6

Table B6(c). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2020

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.22%	6.4	0.23%	6.4	0.45%	12.8
Second decile	0.69%	89.5	0.10%	13.3	0.79%	103.1
Third decile	1.37%	268.1	0.12%	24.1	1.50%	293.1
Fourth decile	1.44%	383.2	0.16%	43.3	1.60%	427.1
Fifth decile	1.30%	454.4	0.19%	68.0	1.49%	523.6
Sixth decile	1.36%	625.9	0.22%	100.3	1.58%	728.5
Seventh decile	1.53%	903.6	0.24%	140.2	1.78%	1048.1
Eighth decile	1.70%	1309.3	0.28%	214.9	1.98%	1531.6
Ninth decile	1.64%	1746.7	0.34%	357.8	1.99%	2115.1
Next 5%	1.61%	2407.5	0.47%	697.4	2.09%	3133.2
Next 4%	2.55%	6610.4	0.77%	2005.6	3.36%	8705.0
Top 1%	0.74%	8841.4	0.57%	6888.1	1.32%	15852.8
All units	1.55%	1035.8	0.42%	280.2	1.98%	1325.0

Table B6(d). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2021

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.24%	7.0	0.15%	4.6	0.39%	11.5
Second decile	0.69%	92.4	0.07%	9.3	0.76%	102.0
Third decile	1.33%	267.3	0.08%	16.9	1.42%	284.7
Fourth decile	1.36%	372.9	0.11%	30.4	1.47%	403.8
Fifth decile	1.25%	449.3	0.13%	47.9	1.38%	498.1
Sixth decile	1.32%	623.9	0.15%	70.4	1.47%	696.1
Seventh decile	1.50%	910.4	0.16%	98.3	1.67%	1011.8
Eighth decile	1.67%	1326.5	0.19%	151.0	1.87%	1482.5
Ninth decile	1.59%	1737.3	0.23%	251.2	1.82%	1995.8
Next 5%	1.56%	2388.4	0.32%	488.9	1.89%	2897.1
Next 4%	2.49%	6640.2	0.53%	1413.8	3.05%	8116.1
Top 1%	0.70%	8620.3	0.39%	4861.0	1.10%	13567.9
All units	1.50%	1033.8	0.29%	197.2	1.80%	1237.2

Table B6(e). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2022

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.24%	7.5	0.08%	2.5	0.33%	10.0
Second decile	0.79%	108.9	0.04%	5.2	0.83%	114.2
Third decile	1.47%	302.9	0.05%	9.3	1.51%	312.5
Fourth decile	1.33%	376.5	0.06%	16.8	1.39%	393.5
Fifth decile	1.20%	445.5	0.07%	26.6	1.27%	472.6
Sixth decile	1.28%	624.8	0.08%	38.9	1.36%	664.6
Seventh decile	1.48%	918.6	0.09%	54.3	1.57%	974.6
Eighth decile	1.66%	1351.4	0.10%	83.4	1.76%	1437.4
Ninth decile	1.53%	1723.7	0.12%	139.0	1.66%	1866.5
Next 5%	1.51%	2384.0	0.17%	271.3	1.69%	2666.2
Next 4%	2.45%	6712.8	0.29%	781.6	2.75%	7528.2
Top 1%	0.67%	8456.9	0.21%	2689.4	0.88%	11193.7
All units	1.47%	1042.1	0.15%	109.1	1.63%	1154.6

Table B6(f). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2023

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.27%	8.7	0.02%	0.6	0.29%	9.3
Second decile	0.81%	116.5	0.01%	1.2	0.82%	117.7
Third decile	1.42%	302.5	0.01%	2.1	1.43%	304.7
Fourth decile	1.25%	364.3	0.01%	3.9	1.27%	368.2
Fifth decile	1.15%	439.8	0.02%	6.1	1.17%	446.0
Sixth decile	1.25%	629.4	0.02%	8.8	1.27%	638.4
Seventh decile	1.46%	934.2	0.02%	12.4	1.48%	947.0
Eighth decile	1.63%	1371.5	0.02%	19.0	1.66%	1391.1
Ninth decile	1.48%	1712.0	0.03%	31.7	1.51%	1744.6
Next 5%	1.48%	2398.1	0.04%	61.7	1.52%	2462.3
Next 4%	2.41%	6801.1	0.06%	178.8	2.48%	6987.5
Top 1%	0.64%	8415.7	0.05%	617.0	0.69%	9043.5
All units	1.44%	1047.8	0.03%	24.9	1.47%	1073.5

Table B6(g). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2024

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.28%	9.1	-0.02%	-0.8	0.25%	8.3
Second decile	0.82%	121.5	-0.01%	-1.6	0.81%	119.9
Third decile	1.40%	306.3	-0.01%	-2.8	1.38%	303.5
Fourth decile	1.18%	353.4	-0.02%	-5.1	1.16%	348.3
Fifth decile	1.10%	435.4	-0.02%	-7.9	1.08%	427.3
Sixth decile	1.22%	630.4	-0.02%	-11.4	1.20%	618.6
Seventh decile	1.45%	954.3	-0.02%	-16.1	1.42%	937.7
Eighth decile	1.61%	1391.4	-0.03%	-24.5	1.58%	1366.1
Ninth decile	1.42%	1701.4	-0.03%	-41.1	1.39%	1659.0
Next 5%	1.44%	2410.8	-0.05%	-79.6	1.39%	2327.7
Next 4%	2.37%	6898.4	-0.08%	-230.4	2.29%	6657.7
Top 1%	0.62%	8352.1	-0.06%	-795.1	0.56%	7541.6
All units	1.40%	1053.9	-0.04%	-32.2	1.36%	1020.6

Table B6(h). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2025

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	0.28%	9.6	-0.03%	-1.1	0.24%	8.5
Second decile	0.93%	142.8	-0.01%	-2.2	0.92%	140.5
Third decile	1.47%	331.8	-0.02%	-4.0	1.45%	327.7
Fourth decile	1.13%	347.9	-0.02%	-7.2	1.10%	340.6
Fifth decile	1.07%	432.5	-0.03%	-11.4	1.04%	420.9
Sixth decile	1.19%	635.3	-0.03%	-16.2	1.16%	618.7
Seventh decile	1.44%	977.5	-0.03%	-22.9	1.41%	953.8
Eighth decile	1.58%	1406.7	-0.04%	-35.0	1.54%	1370.6
Ninth decile	1.37%	1686.1	-0.05%	-58.5	1.32%	1625.8
Next 5%	1.41%	2426.8	-0.07%	-112.9	1.34%	2308.8
Next 4%	2.34%	6999.3	-0.11%	-328.8	2.22%	6655.9
Top 1%	0.61%	8382.0	-0.08%	-1138.1	0.52%	7221.8
All units	1.38%	1065.2	-0.06%	-45.9	1.32%	1017.8

Table B6(i). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2026

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	-0.02%	-0.8	0.02%	0.7	0.00%	-0.1
Second decile	-0.26%	-40.4	0.01%	1.4	-0.25%	-39.0
Third decile	-0.33%	-75.6	0.01%	2.5	-0.31%	-73.1
Fourth decile	-0.26%	-84.2	0.01%	4.5	-0.25%	-79.7
Fifth decile	-0.16%	-66.9	0.02%	7.2	-0.14%	-59.7
Sixth decile	-0.12%	-65.9	0.02%	10.3	-0.10%	-55.6
Seventh decile	-0.14%	-97.4	0.02%	14.6	-0.12%	-82.9
Eighth decile	-0.20%	-181.9	0.02%	22.3	-0.17%	-159.6
Ninth decile	-0.21%	-269.0	0.03%	37.4	-0.18%	-231.7
Next 5%	-0.21%	-373.9	0.04%	72.1	-0.17%	-301.9
Next 4%	-0.22%	-668.4	0.07%	211.2	-0.15%	-457.5
Top 1%	-0.07%	-1011.9	0.05%	730.2	-0.02%	-282.4
All units	-0.18%	-142.9	0.04%	29.4	-0.14%	-113.6

Table B6(j). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2027

	Individual Income Tax		Corporate Tax		Both	
Income groups	Pct change	Avg change ($)	Pct change	Avg change ($)	Pct change	Avg change ($)
Bottom decile	-0.02%	-0.9	0.12%	4.5	0.10%	3.6
Second decile	-0.29%	-47.0	0.05%	8.8	-0.24%	-38.2
Third decile	-0.36%	-86.3	0.06%	15.4	-0.30%	-70.9
Fourth decile	-0.29%	-95.2	0.09%	28.7	-0.20%	-66.5
Fifth decile	-0.17%	-74.5	0.11%	45.5	-0.07%	-29.0
Sixth decile	-0.13%	-75.2	0.11%	64.4	-0.02%	-10.9
Seventh decile	-0.16%	-113.3	0.13%	91.8	-0.03%	-21.9
Eighth decile	-0.22%	-209.2	0.15%	140.7	-0.07%	-69.3
Ninth decile	-0.24%	-307.4	0.18%	235.7	-0.06%	-72.2
Next 5%	-0.23%	-428.8	0.25%	451.8	0.01%	21.9
Next 4%	-0.24%	-761.4	0.42%	1328.3	0.18%	564.9
Top 1%	-0.08%	-1152.0	0.31%	4604.4	0.23%	3447.5
All units	-0.20%	-163.4	0.23%	185.0	0.03%	21.2

Table D1. Percent difference between GDP under the baseline and under the reform

Year	GDP ratio
2018	0.67%
2019	0.96%
2020	1.21%
2021	1.45%
2022	1.65%
2023	1.83%
2024	2.06%
2025	2.05%
2026	1.47%
2027	1.48%
Steady state	2.05%

Figure D1. Path of GDP under the pre-TCJA baseline and under the TCJA

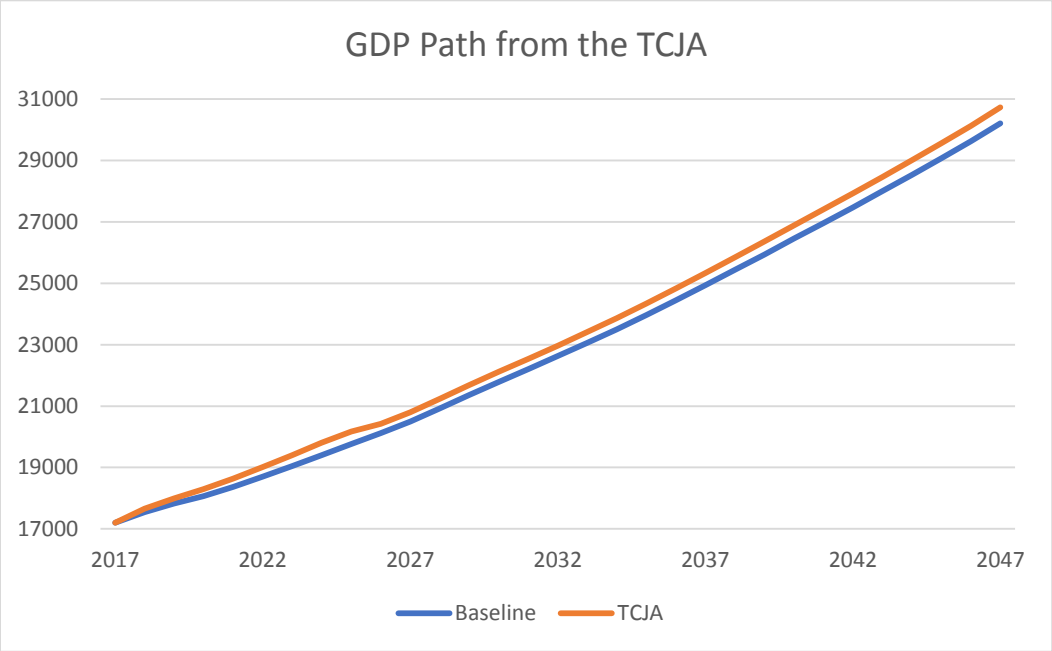

Table D2. NOL distortion under different assumptions, 2018

p	g	Pre-TCJA	TCJA	$\frac{(\theta_1 - 1)}{(\theta_0 - 1)}$
0.1	0	1.0133	1.0231	1.727
0.15	0	1.0022	1.0054	2.486
0.1	0.02	1.0134	1.0231	1.725
0.15	0.02	1.0021	1.0054	2.553
0.1	-0.02	1.0140	1.0239	1.711
0.15	-0.02	1.0023	1.0056	2.404

Table D3(a). Change in after-tax income using static and dynamic approaches, 2018

	Static		Dynamic	
Income group	Percent	Average ($)	Percent	Average ($)
Bottom decile	0.55%	14	1.19%	31
Second decile	0.81%	99	1.32%	162
Third decile	1.57%	292	2.00%	371
Fourth decile	1.81%	456	2.22%	558
Fifth decile	1.65%	549	2.11%	700
Sixth decile	1.74%	756	2.24%	977
Seventh decile	1.91%	1069	2.45%	1371
Eighth decile	2.12%	1554	2.67%	1962
Ninth decile	2.21%	2234	2.79%	2819
Next 5%	2.37%	3389	2.99%	4260
Next 4%	3.75%	9263	4.37%	10792
Top 1%	1.56%	18029	2.20%	25514
All units	2.21%	1405	2.78%	1769

Table D3(b). Change in after-tax income using static and dynamic approaches, 2023

	Static		Dynamic	
Income group	Percent	Average ($)	Percent	Average ($)
Bottom decile	0.29%	9	2.00%	64
Second decile	0.82%	118	2.18%	311
Third decile	1.43%	305	2.54%	540
Fourth decile	1.27%	368	2.31%	672
Fifth decile	1.17%	446	2.38%	909
Sixth decile	1.27%	638	2.61%	1307
Seventh decile	1.48%	947	2.91%	1863
Eighth decile	1.66%	1391	3.15%	2644
Ninth decile	1.51%	1745	3.07%	3557
Next 5%	1.52%	2462	3.17%	5146
Next 4%	2.48%	6987	4.15%	11716
Top 1%	0.69%	9043	2.45%	31943
All units	1.47%	1073	3.01%	2191

Table D3(c). Change in after-tax income using static and dynamic approaches, 2027

	Static		Dynamic	
Income group	Percent	Average ($)	Percent	Average ($)
Bottom decile	0.10%	4	1.47%	54
Second decile	-0.24%	-38	0.78%	127
Third decile	-0.30%	-71	0.53%	128
Fourth decile	-0.20%	-67	0.61%	200
Fifth decile	-0.07%	-29	0.88%	378
Sixth decile	-0.02%	-11	1.01%	569
Seventh decile	-0.03%	-22	1.07%	772
Eighth decile	-0.07%	-69	1.10%	1039
Ninth decile	-0.06%	-72	1.19%	1556
Next 5%	0.01%	22	1.30%	2379
Next 4%	0.18%	565	1.49%	4732
Top 1%	0.23%	3447	1.66%	24398
All units	0.03%	21	1.23%	1013