Distributional Impacts of the Tax Cuts and Jobs Act

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Impact on Households

- The TCJA includes important reforms and changes to the individual and business side tax provisions
  - Doubling of the standard deduction
  - Elimination of Personal and Dependent Exemption
  - Expanded Child Tax Credit
  - Cut in personal tax rates
  - Reforms to mortgage interest deduction and property tax deductions
  - Corporate rate cut to 21 percent
  - Expensing
  - Pass-through deduction
  - Several provisions phase out over time

- Some of the individual provisions can be modeled directly as changes in taxes or after-tax incomes

- But how do the changes on the business side translate to changes in household incomes or tax rates?

- What does the distribution look like for households with different incomes, family structures?

Data and Open Source Model

- For our distributional analysis of the individual income tax provisions, we rely on the open source Tax-Calculator microsimulation model.
  - Code:https://github.com/codykallen/tax-distributor
- 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.

Methodology

- 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.

Income Measure

- Our income measure relies on income information from tax returns as well as imputations of other income sources from the CPS. We refer to this 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).

Household equivalence scales

- The general formula for an equivalence scale is

$$S = (1 + w(a)(n(a) - 1) + w(c)n(c))e$$

where na is the number of adults, and nc 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 $wa \in [0,1]$ to each additional adult, and a weight of wc 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,wa=wc=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,wa=0.7,wc=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,wa=0.5,wc=0.3) (Atkinson, Rainwater and Smeeding, 1995).

- For tax changes that have different effects on households of different sizes, equivalence scales have nontrivial effects on distributional implications

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

Income group	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
	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(j)(i). Distribution of Tax Burden Levels in 2026

Income group	Average tax rate (%)		Share of tax liability (%)		No II tax liability (%)	
	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

Individual Provisions Summary

- 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 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.

- In 2026, 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.

Effect of Choosing Different Equivalence Scales

- 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 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.

Table 5. Distributional Implications of Different Equivalence Scales, 2018

Income group	No scale		Tax unit size		Square root		Oxford	
	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.

Different Demographic Subgroups

- For these tables, we use no equivalence scale.

- Table 7(a) shows that among married couples filing jointly, only 13 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 eliminated several marriage penalties, the tax cuts for married filers are larger than those for unmarried filers, with an average tax cut for married joint filers 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. 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.

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(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

Distributing Corporate Provisions

- 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: 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.

Allocating corporate equity

- Nonprofit shareholders

- Private pension funds

- State and Local governments

- Distribute to Individual Shareholders

Results

- 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.

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

| Income groups	Individual Income Tax		Corporate Tax		Both	
	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(i). Distributional Analysis of the Individual Income Tax and Corporate Tax Changes, 2026

Income groups	Individual Income Tax		Corporate Tax		Both	
	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

Dynamic Corporate Impact

- 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.

- We estimate a level increase in GDP of 1.5% by 2027.

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

GDP Path from the TCJA
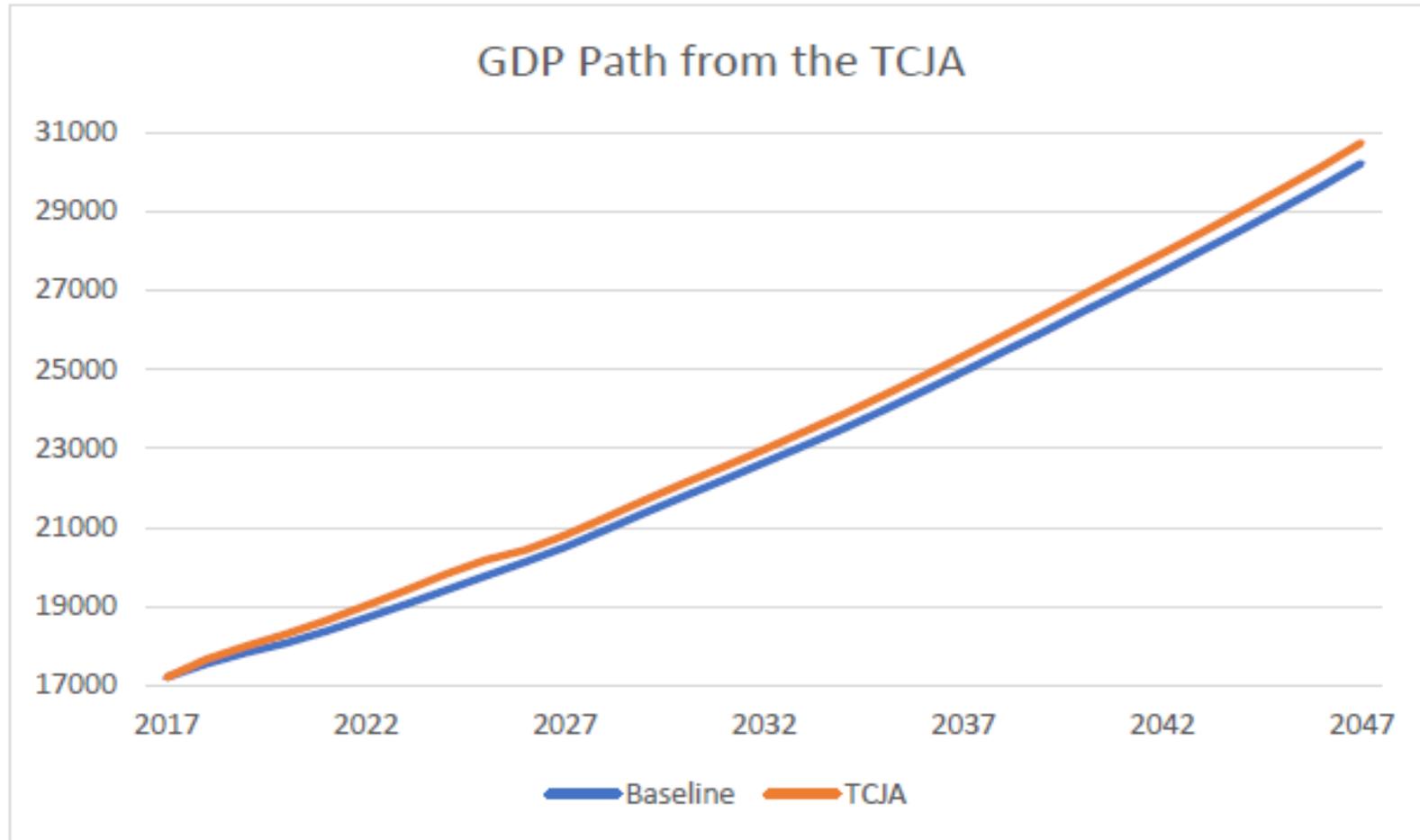
Results

- Using these growth estimates, we update the distributional effects of the TCJA. We present three example years, 2018, 2023 and 2027. 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.

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

Income group	Static		Dynamic	
	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

Income group	Static		Dynamic	
	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

Income group	Static		Dynamic	
	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

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 by 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.