

# Universal Basic Income Reform

Open Source Policy Center

American Enterprise Institute

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# 1 Introduction

Widening inequality and increasing job disruption due to technology have increased discussion of an universal basic income (UBI) in academic circles. The concept of an UBI is simple – every person, above a certain age, receives a lump sum of cash from the government regardless of income, employment status, or any other requirement typically used in welfare programs. This income is then taxed, along with any additional earnings, as normal income. To fund the UBI, we propose removing all welfare and transfer programs and eliminating all tax credits, loopholes, and deductions (excluding the charitable deduction). Using the American Enterprise Institute’s Open Source Policy Center’s (OSPC) modeling suite, this report simulates the repeal of major welfare and transfer programs, the elimination of tax provisions and deductions to broaden the tax base, and three potential UBI policies that would neutralize the revenue impact of the aforementioned reforms on a static and dynamic basis. The paper also evaluates the welfare consequences of these reforms, accounting for the inefficiency costs of welfare programs. Analysis is performed by separating tax units by percentiles of average gross income (AGI). All calculations are performed using 2014 data.

# 2 Welfare/Transfer Program Repeal

We begin by repealing all welfare and transfer programs including Medicare, Medicaid, SSI, SNAP, Social Security, and Veterans Benefits.<sup>1</sup> We also repealed unemployment insurance, housing assistance, and student aid; related public assistance; and most other individual payment programs.<sup>2</sup> We account for decreased tax revenue from the repeal of Social Security benefits, which are taxed under the current system. Repealing these programs yields 2.24 trillion dollars in funds that can be used to fund the UBI.<sup>3</sup> The effects of repealing the welfare and transfer programs are shown in the following table.

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<sup>1</sup>Program payments imputed using OSPC C-TAM model. A full description of the model can be found in the appendix.

<sup>2</sup>A full list of the programs repealed and their costs can be found in the appendix.

<sup>3</sup>Author’s calculations using C-TAM, Tax-Calculator, and Office of Management and Budget data (*Table 3.2—Outlays by Function and Subfunction: 1962–2021* and *Table 11.3—Outlays for Payments for Individuals by Category and Major Program: 1940–2021*).

Table 1: Welfare and Transfer Program Repeal Effect on Benefits

	Total Benefits (\$ billions)	Average Benefits (\$)
0-10%	260,793,244,069.9	16,204.7
10-20%	206,646,621,447.5	12,839.0
20-30%	189,645,621,181.0	11,783.9
30-40%	211,723,779,115.6	13,155.7
40-50%	216,233,693,734.1	13,434.3
50-60%	206,971,735,461.3	12,858.8
60-70%	213,024,113,826.1	13,235.0
70-80%	235,575,671,186.2	14,637.5
80-90%	255,111,509,104.0	15,849.8
90-100%	286,803,597,494.8	17,822.4
Sum	2,282,529,586,620.6	141,821.1

Source: Author's calculations using OSPC calculator.

The repeal of benefit and transfer programs appears to have a homogenous effect across AGI percentiles due to the inclusion of Social Security and Medicaid.<sup>4</sup> Social Security disbursements are tied to an individual's income, compensating for the larger receipt of other benefit and transfer programs by low income earners. <sup>5</sup>

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<sup>4</sup> As a result of these reforms, the bottom 20 percent of income earners lose 20.47 percent of the benefits, while the top 20 percent of earners lose 23.74 percent of the benefits.

<sup>5</sup> C-TAM only models Medicare, Medicaid, SSI, SNAP, Social Security, and Veterans Benefits. The distribution of all non-modeled programs was assumed to reflect the distribution of the modeled benefits.

Figure 1: Average Benefit Change by Percentile of AGI

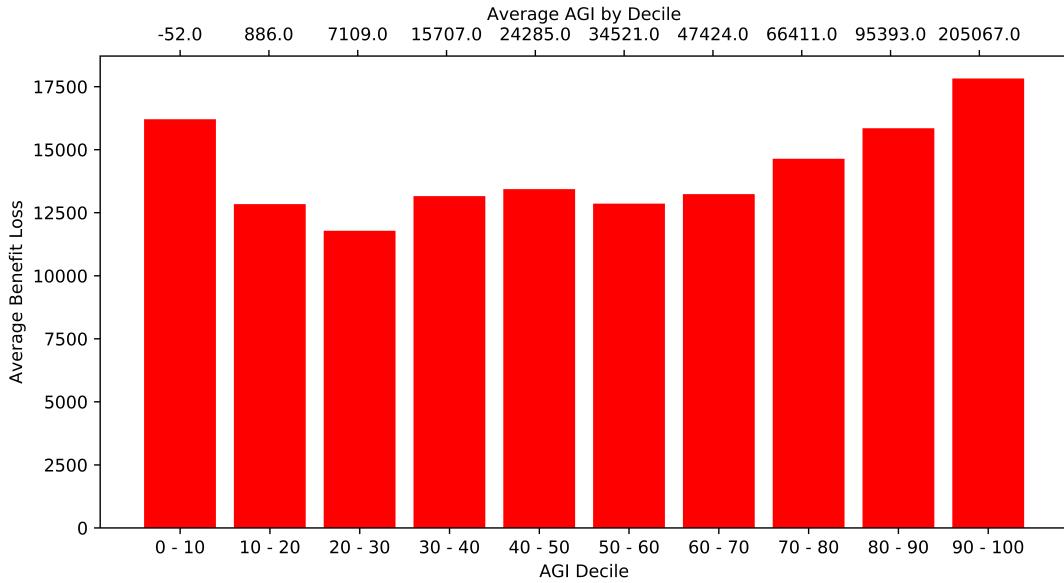
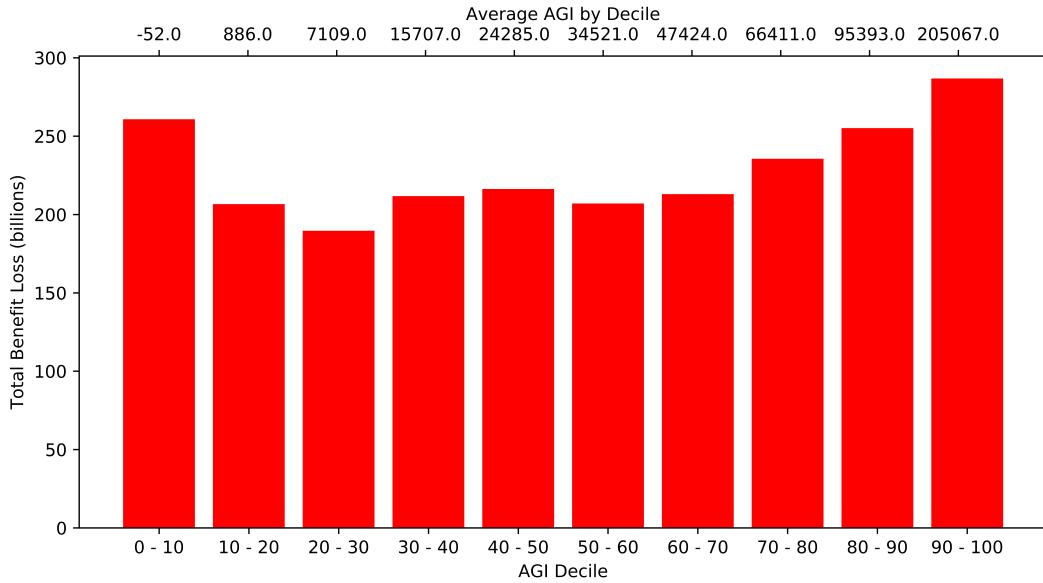


Figure 2: Total Benefit Change by Percentile of AGI



These reforms have similar effects for both primary and secondary earners, raising the MTR for those with lower income and lowering the MTR for those with middle incomes. Those with higher incomes are unaffected by the repeal of welfare and transfer programs. One benefit of the reforms is it removes the disincentive to work associated with welfare "notches." These form when the MTR is such that the additional income from

an extra dollar earned through work will result in the loss of significant welfare benefits.

### 3 Tax Exemption and Deduction Repeal

The current tax code is littered with numerous exemptions and deductions designed to give certain segments of the population tax breaks. These provisions narrow the tax base, distort tax unit consumption decisions, and have disparate effects across the income distribution. In addition to repealing all welfare and transfer programs, we repeal all above-the-line, standard, and itemized deductions (excluding the charitable deduction); all tax credits; the personal exemption; and the earned income tax credit.

With the repeal of the aforementioned tax provisions, roughly 92 percent of tax units will face a tax increase resulting in \$708 billion in new liabilities, nearly half of that falling on the top twenty percent of earners.<sup>6</sup> The bottom 20 percent of income earners face 3.68 percent of the increase in tax liabilities, while the top 20 percent experience face 49.01 percent of the increase in liabilities.

Table 2: Tax Liability by Percentile of AGI

	Total (dollars)	Average (dollars)	Increase (percent)	Share (percent)
0-10%	4,743,751,054	291	69.08%	0.67%
10-20%	21,336,221,557	1,310	83.86%	3.01%
20-30%	42,821,075,903	2,628	83.03%	6.04%
30-40%	47,877,922,391	2,939	90.86%	6.75%
40-50%	51,212,811,634	3,143	96.03%	7.23%
50-60%	51,948,472,021	3,189	98.59%	7.33%
60-70%	62,946,072,823	3,864	99.51%	8.88%
70-80%	78,493,041,730	4,817	99.83%	11.07%
80-90%	118,313,821,514	7,262	99.94%	16.69%
90-100%	229,106,285,671	14,062	99.77%	32.32%
Sum	708,799,476,297			100.00%

Source: Author's calculations using OSPC calculator.

<sup>6</sup>Author's calculations using OSPC Tax-Calculator.

Figure 3: Average Tax Liability by Percentile of AGI

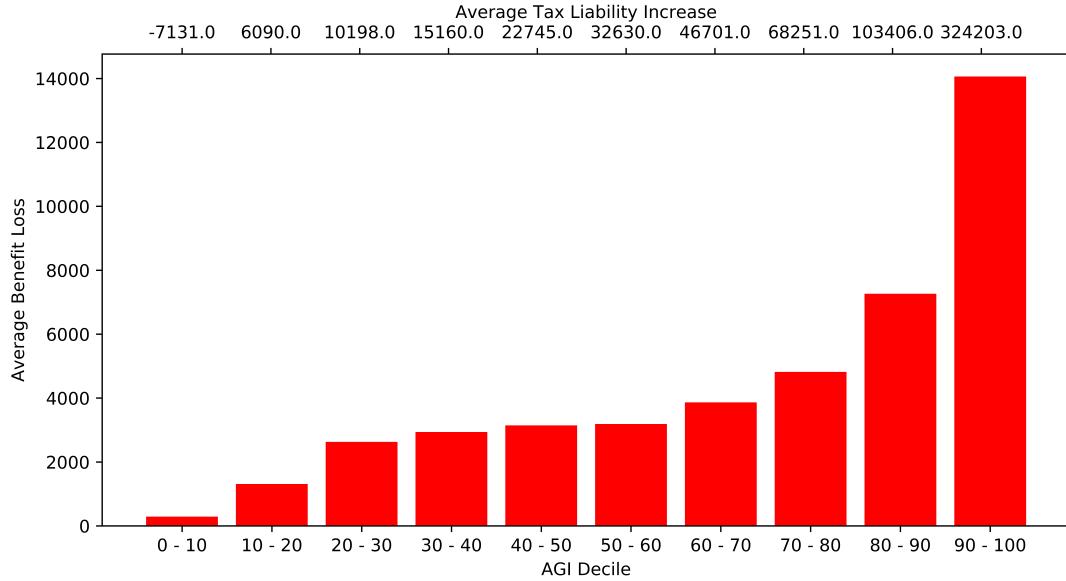
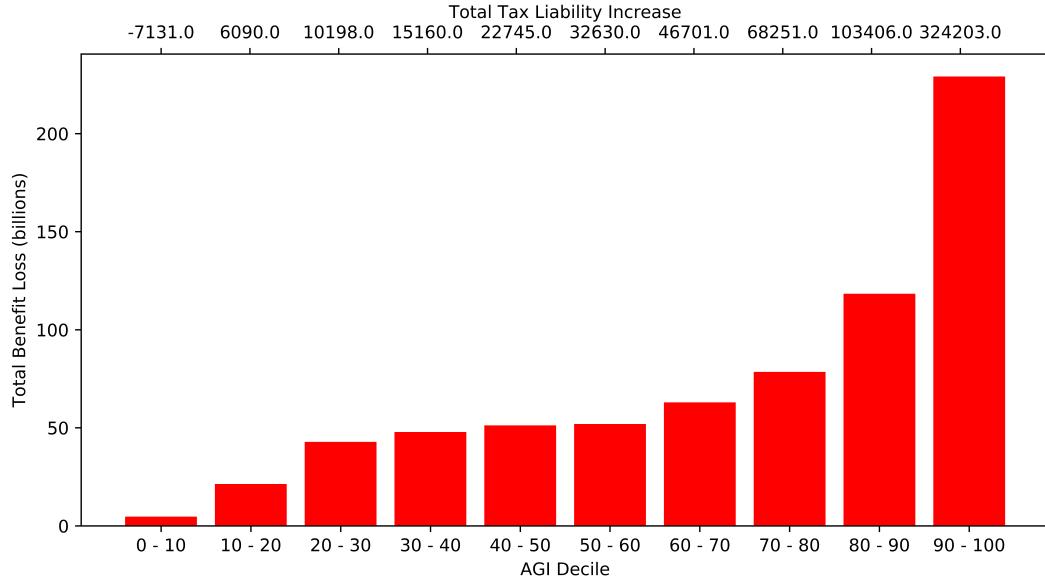


Figure 4: Total Tax Liability by Percentile of AGI



The reforms lead to almost across the board marginal tax rate (MTR) increases, the largest of which are seen at the lower end of the income spectrum. The bottom quarter of earners see their marginal net-of-tax rate ( $1 - MTR$ ) increase 17 percentage points for both primary and secondary earners.<sup>7</sup>

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<sup>7</sup> Author's calculations using OSPC Tax-Calculator.

Figure 5: Average Primary Earner MTR by Percentile

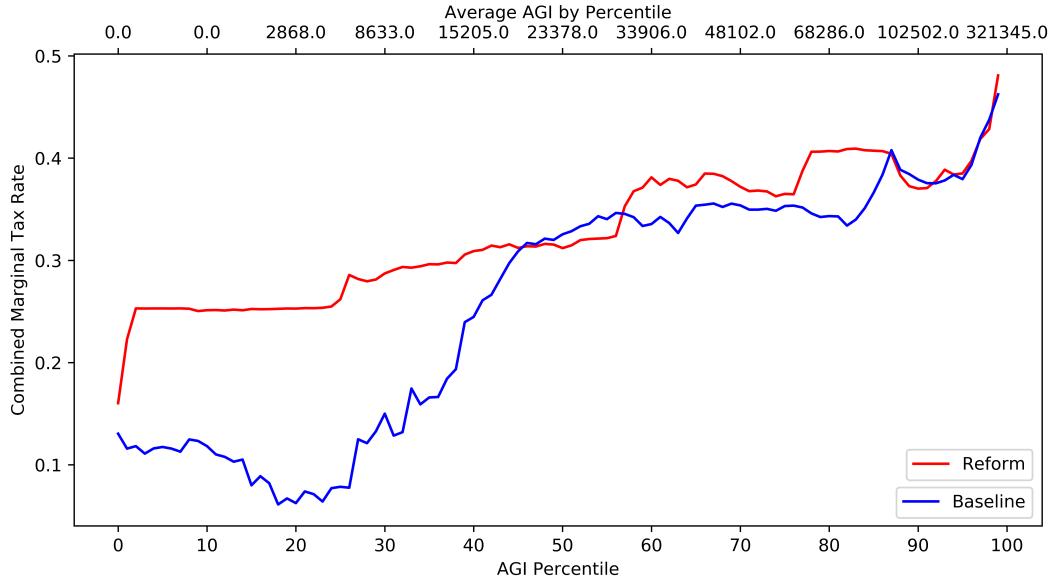
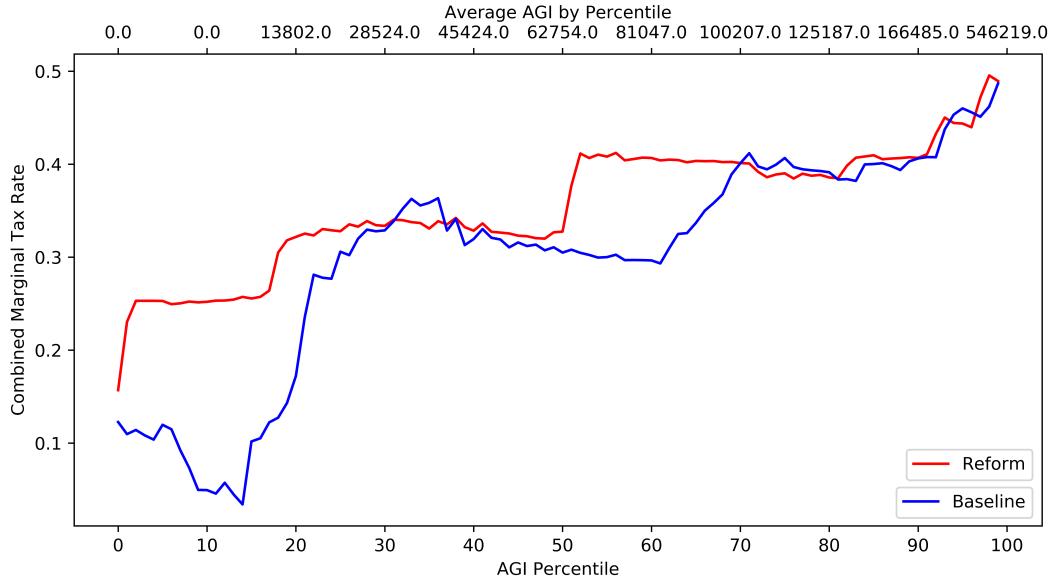


Figure 6: Average Secondary Earner MTR by Percentile



## 4 Tax and Welfare/Transfer Repeal

This section combines the welfare and transfer repeal from section two and tax reform from section three to examine the joint distributional impact. The top ten percent of earners see an average negative impact of just over \$30,000 compared to slightly more than \$15,000 in the bottom ten percent. The top 20 percent

experiences 30.21 percent of the increase in tax liabilities, while the lowest 20 percent pay 16.28 percent of the increase in tax liabilities.

Table 3: Revenue Effect of Benefit and Tax Repeal

	Total Revenue Change (\$)	Average Revenue Change (\$)
0-10%	266	16,299
10-20%	228	13,994
20-30%	232	14,268
30-40%	260	15,935
40-50%	268	16,422
50-60%	260	15,959
60-70%	280	17,206
70-80%	324	19,910
80-90%	386	23,676
90-100%	531	32,573

Source: Author's calculations using OSPC calculator.

Reforming the tax code to remove deductions, exemptions, and other provisions that narrow the base as well as repealing most programs that distribute payment to individuals, \$2.9 trillion was freed to apply to a UBI.

Figure 7: Average Revenue Effect of Benefit and Tax Repeal by Percentile of AGI

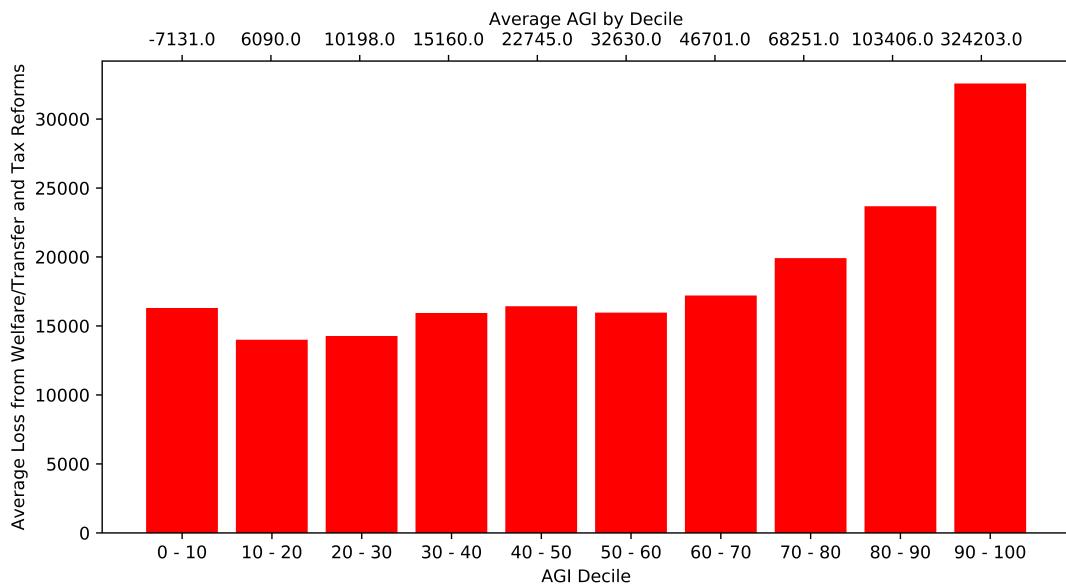
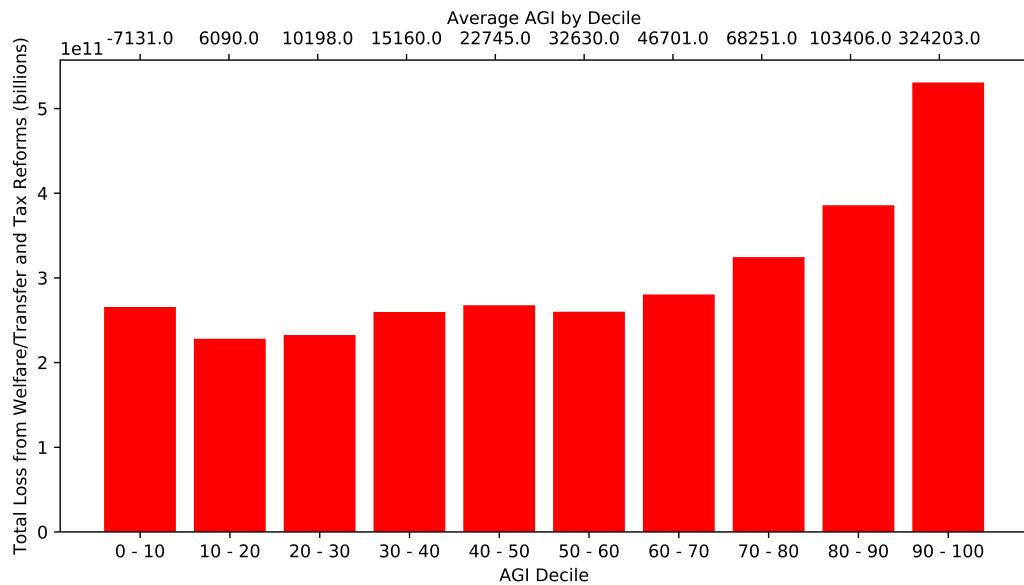


Figure 8: Total Revenue Effect of Benefit and Tax Repeal by Percentile of AGI



These reforms result in \$2.9 trillion that can be used to fund a UBI.

## 5 Tax and Welfare/Transfer Repeal with UBI for All

Rather than set an arbitrary amount as a UBI and then search for cuts and reforms in order to pay for it, we took the savings from the previously discussed welfare and tax reforms, as well as the additional tax revenues that would be gained by making the UBI taxable, and used our models to determine how much could be given to each person while keeping the policy revenue neutral.

Table 4: Increase in Tax Liabilities by Percentile of AGI

	Total Change (\$)	Average Change (\$)	Increase (%)	Share of Change (%)
0-10%	60,924,588,192	3,739	97.71%	4.47%
10-20%	70,769,202,742	4,344	99.96%	5.19%
20-30%	84,405,508,566	5,180	100.00%	6.19%
30-40%	92,011,305,963	5,648	99.98%	6.75%
40-50%	101,927,967,231	6,256	99.99%	7.47%
50-60%	110,549,703,962	6,785	100.00%	8.11%
60-70%	125,247,582,201	7,688	99.98%	9.18%
70-80%	149,044,403,673	9,147	99.85%	10.93%
80-90%	209,647,667,511	12,868	99.75%	15.37%
90-100%	359,130,242,555	22,043	99.51%	26.34%
Sum	1,363,658,172,597		100.00%	

Source: Author's calculations using OSPC calculator.

The first UBI policy we modeled was programmed to provide a basic income for the entire population, with those below eighteen receiving half of what those above eighteen did. We found that a UBI of \$12,068.06 for all those above 18 and \$6,034.03 for all below is feasible.<sup>8</sup> The combination of ending policies that lower tax liability and making the UBI taxable increase tax liabilities across the board. Income received through the UBI by itself moves all non-head-of-household filers from the ten to the fifteen percent tax bracket. The increase is apparent when analyzing the marginal tax rate faced by each income percentile compared to the baseline.

Despite this, there are a handful of tax-units who do see a tax cut. This is likely due to a lack of taxable Social Security income. Of the tax-units receiving a tax cut, their average Social Security income before repeal was \$38,407, compared to an average UBI benefit of \$16,180 and less than one tenth of one percent

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<sup>8</sup>Author's calculations using OSPC Tax-Calculator.

of all tax-units would see their tax liabilities decrease.

Figure 9: Average Primary Earner MTR Change by Percentile of AGI

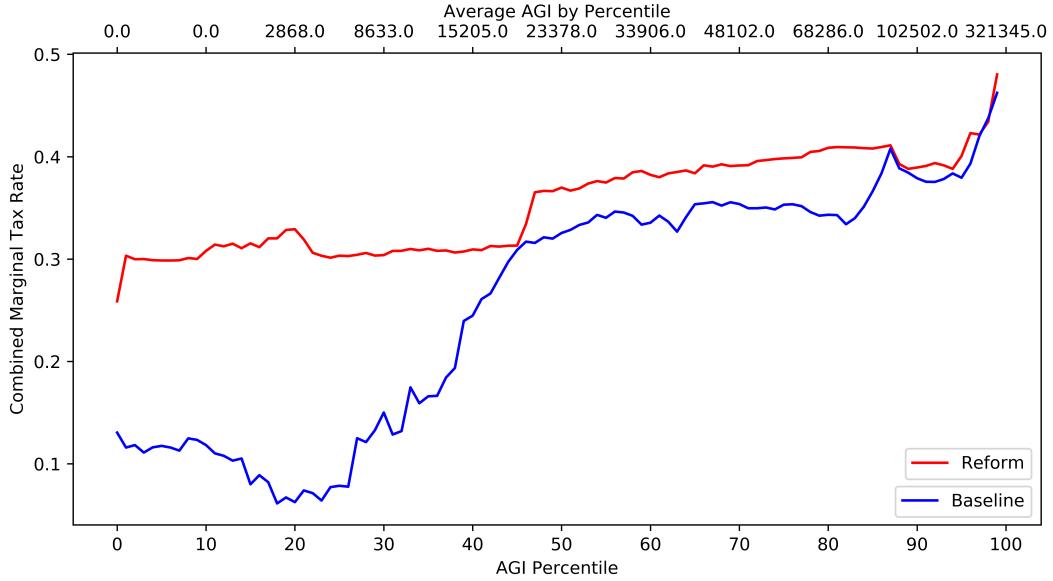
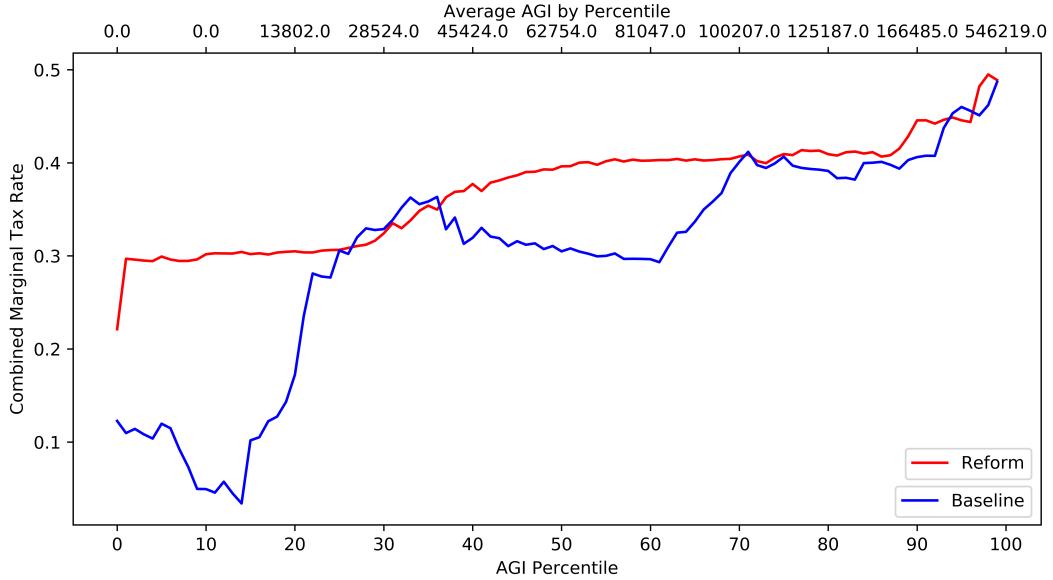


Figure 10: Average Secondary Earner MTR Change by Percentile of AGI



Those in the lower spectrum of earners see their net-of-tax rate drop by as nineteen percent after the reforms and UBI are accounted for.

As a whole, the tax effects of a UBI are largely progressive, with the top twenty percent of earners shouldering over forty percent of the increase in liabilities.

Figure 11: Average Change in Tax Liabilities by Percentile of AGI

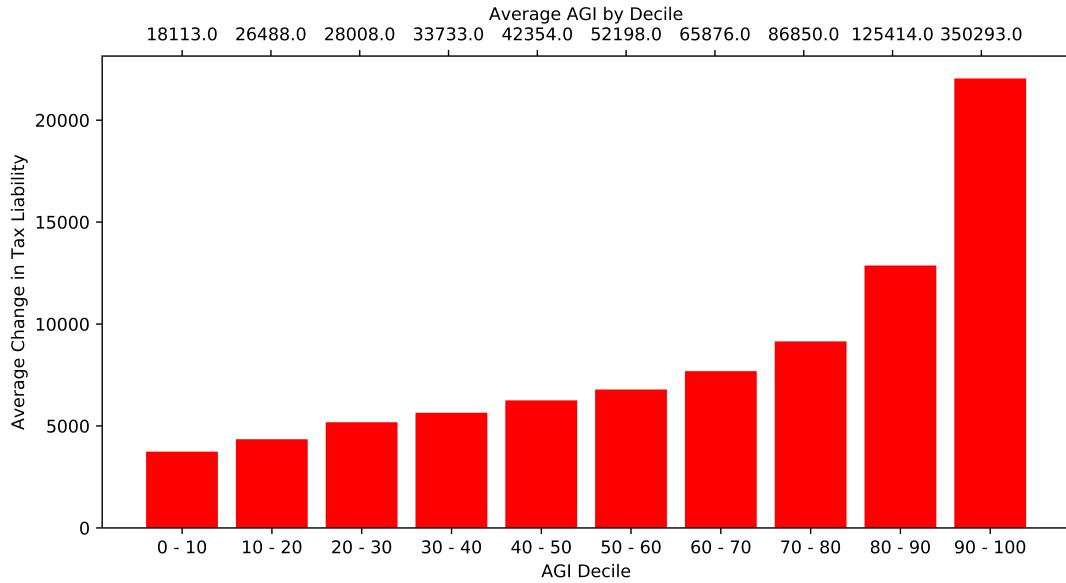
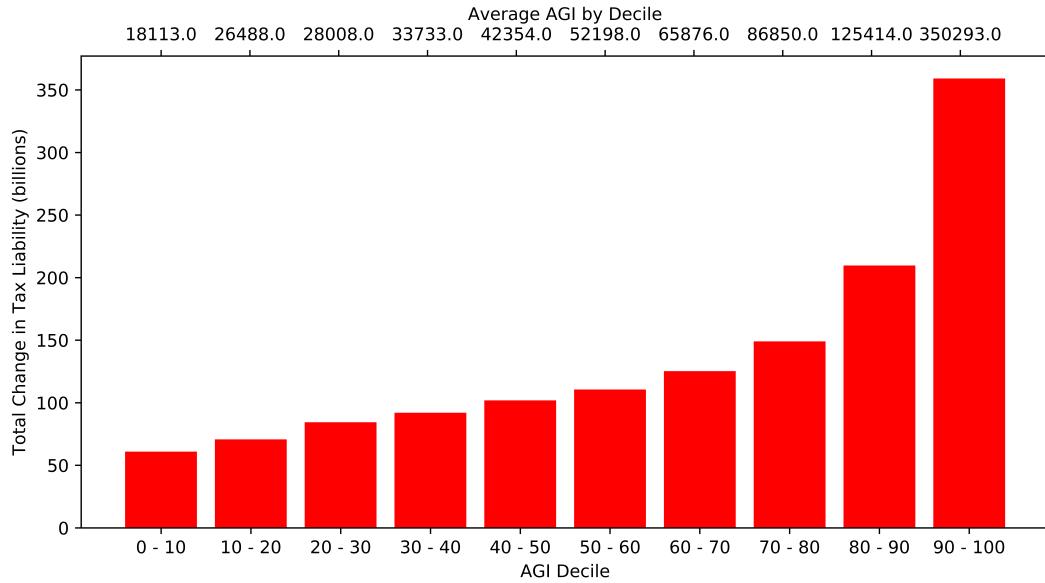


Figure 12: Total Change in Tax Liabilities by Percentile of AGI



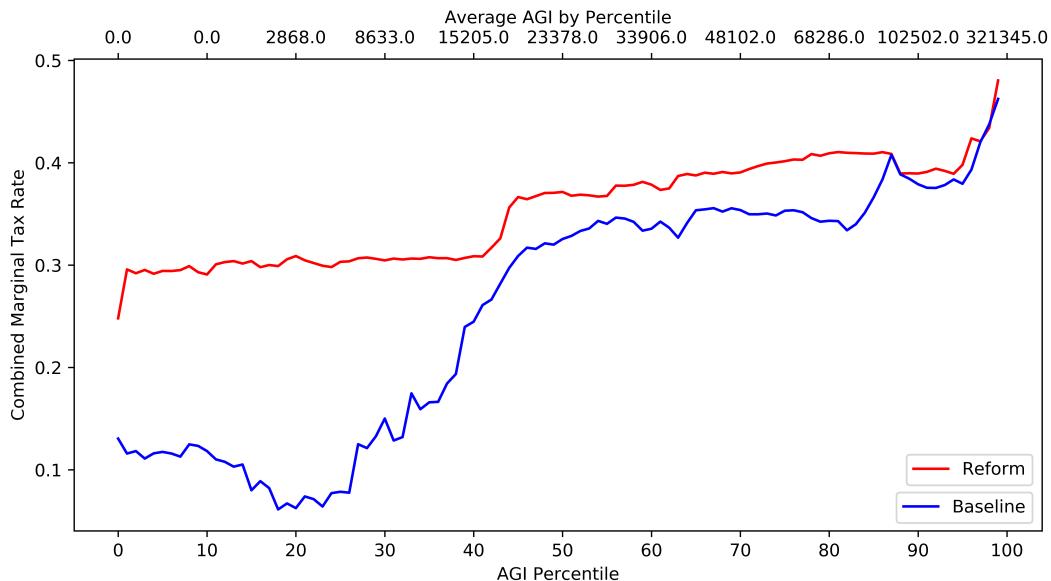
Because everyone, regardless of age, receives a basic income, this policy is friendly to families with children compared to the other two options simulated which exclude anyone under eighteen initially and then all those under twenty-one.

## 6 Tax and Welfare/Transfer Repeal with UBI for 18 Plus

Our second UBI implementation gives a basic income only to individuals above eighteen. Shrinking the targeted population allowed for a much larger UBI given to those who still received it. Using the same criteria to determine the first UBI, revenue neutral after accounting for taxes generated by the UBI, we found that each person above eighteen could be given \$14,262.99 annually.<sup>9</sup>

Again, nearly every tax-unit sees an increase in total tax liability. As with the initial UBI policy, there are a small number of tax-units who actually saw their total liability decrease of \$1,436 on average. This is again likely due to the removal of taxable Social Security benefits from these tax units, as on average they received \$41,117 compared to \$18,611 in UBI.<sup>10</sup>

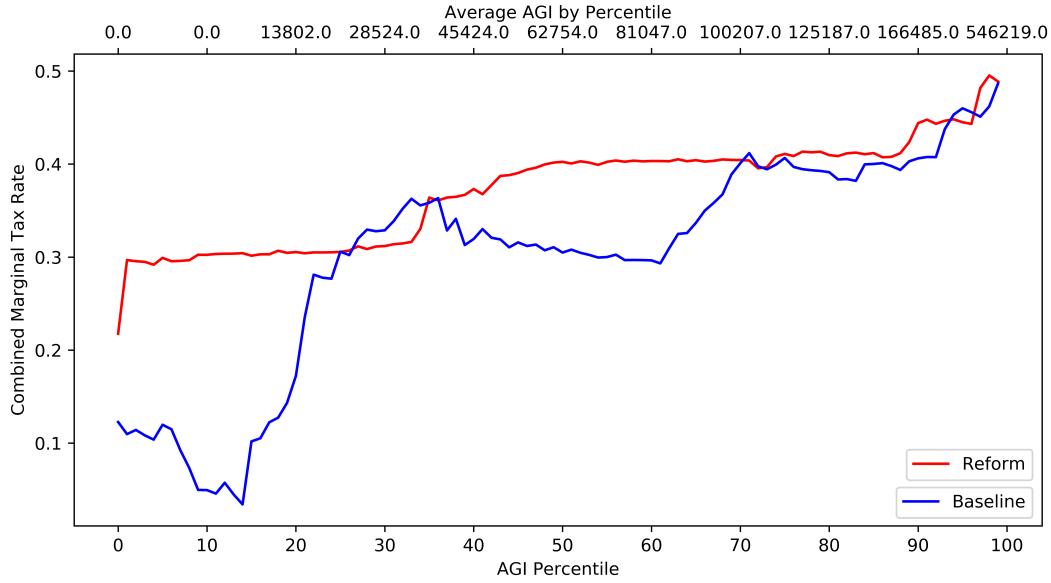
Figure 13: Average Primary Earner MTR Change by Percentile of AGI



<sup>9</sup>Author's calculations using OSPC Tax-Calculator.

<sup>10</sup>Author's calculations using OSPC Tax-Calculator.

Figure 14: Average Secondary Earner MTR Change by Percentile of AGI



As with our first UBI policy, the largest changes in marginal tax rates are seen in the lower end of the income spectrum as those who earn the least are pushed into higher tax brackets by the UBI and tax benefits from the standard deduction and personal exemptions are removed.

Table 5: Increase in Tax Liabilities by Percentile of AGI

	Total Change (\$)	Average Change (\$)	Increase (%)	Share of Change (%)
0-10%	49,636,691,647	3,047	97.11%	3.64%
10-20%	66,853,669,986	4,104	99.51%	4.90%
20-30%	87,222,222,213	5,353	99.82%	6.39%
30-40%	94,341,835,928	5,791	99.94%	6.91%
40-50%	105,712,559,845	6,489	99.99%	7.74%
50-60%	113,610,369,643	6,973	99.98%	8.32%
60-70%	128,619,271,733	7,895	99.96%	9.42%
70-80%	152,829,706,764	9,380	99.91%	11.20%
80-90%	211,269,546,187	12,967	99.83%	15.48%
90-100%	354,901,429,109	21,783	99.67%	26.00%
Sum	1,364,997,303,055		100.00%	

Source: Author's calculations using OSPC calculator.

Figure 15: Average Change in Tax Liabilities by Percentile of AGI

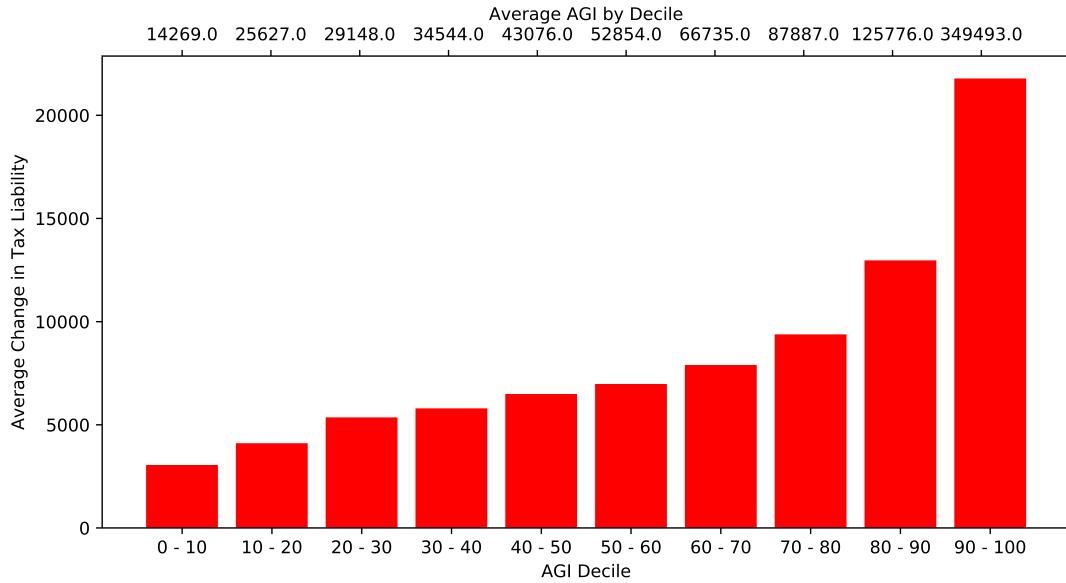
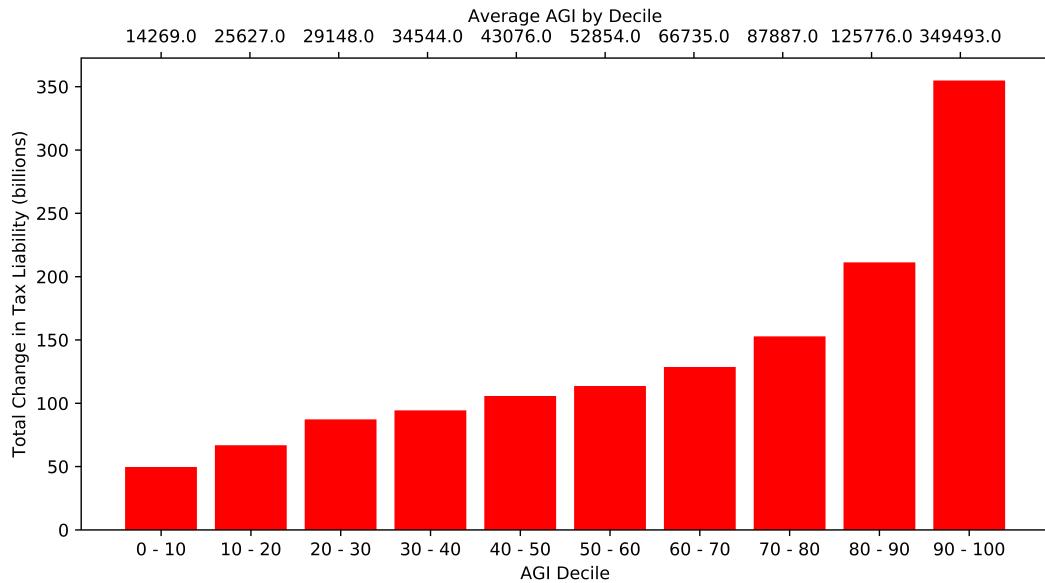


Figure 16: Total Change in Tax Liabilities by Percentile of AGI



In dollar terms, most of the new tax burden still falls on the shoulders of higher earners. Those in the top ten percent would be responsible for more than a quarter of new liabilities compared to the three percent increase in the bottom percentile.

## 7 Tax and Welfare/Transfer Repeal with UBI for 21 Plus

Our final UBI is limited to only those above twenty-one. Again using the goal of revenue neutrality after accounting for taxes on the additional income, we found that a UBI of \$15,068 could be given to all above twenty-one.

Unlike when the UBI was given to all above eighteen, in this policy, the additional tax liabilities offset any drop in liabilities resulting from the loss of taxable benefits so no tax-units see a drop in taxes. As with the previously discussed reforms, the progressivity of the tax effects is still maintained despite large marginal tax rate increases in the bottom percentiles.

Table 6: Tax Liability by Percentile of AGI

	Total Change (\$)	Average Change (\$)	Increase (%)	Share of Change (%)
0-10%	47,733,693,360	2,930	96.11%	3.46%
10-20%	64,971,370,042	3,988	99.20%	4.71%
20-30%	86,187,181,137	5,290	99.61%	6.24%
30-40%	95,146,506,682	5,840	99.83%	6.89%
40-50%	107,005,502,742	6,568	99.86%	7.75%
50-60%	115,744,583,986	7,104	99.91%	8.39%
60-70%	131,487,429,172	8,071	99.85%	9.53%
70-80%	156,678,190,905	9,616	99.90%	11.35%
80-90%	215,697,046,764	13,239	99.84%	15.63%
90-100%	359,508,366,716	22,066	99.71%	26.05%
Sum	1,380,159,871,506			100.00%

Source: Author's calculations using OSPC calculator.

Figure 17: Average Change in Tax Liabilities by Percentile of AGI

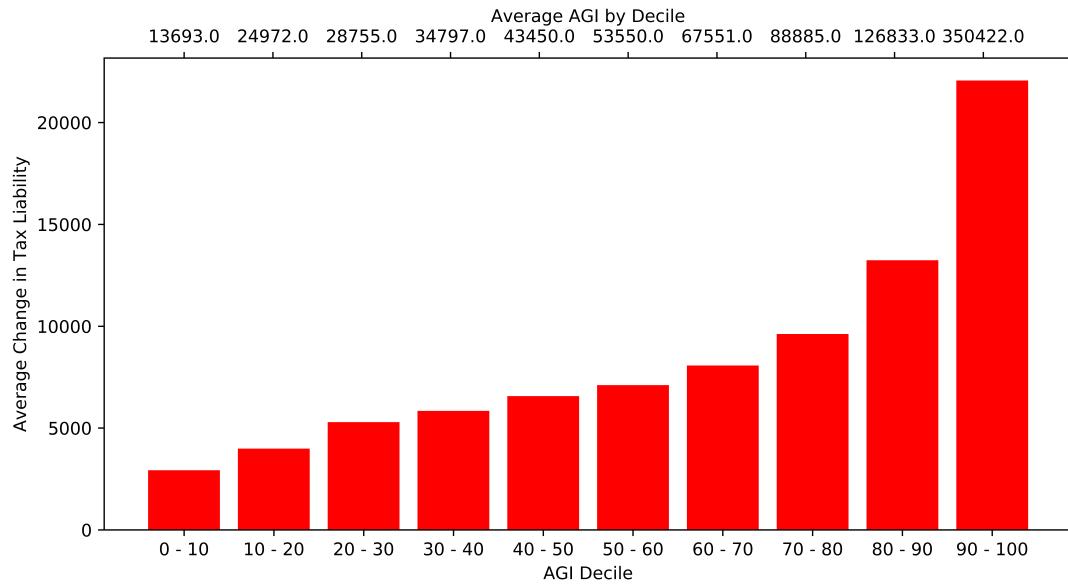


Figure 18: Total Change in Tax Liabilities by Percentile of AGI

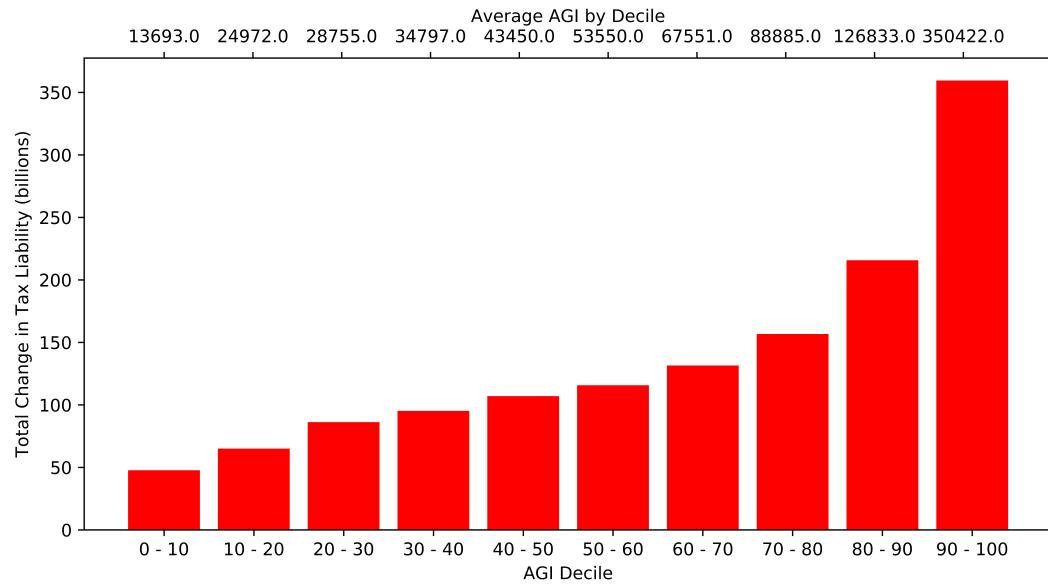


Figure 19: Average Primary Earner MTR Change by Percentile of AGI

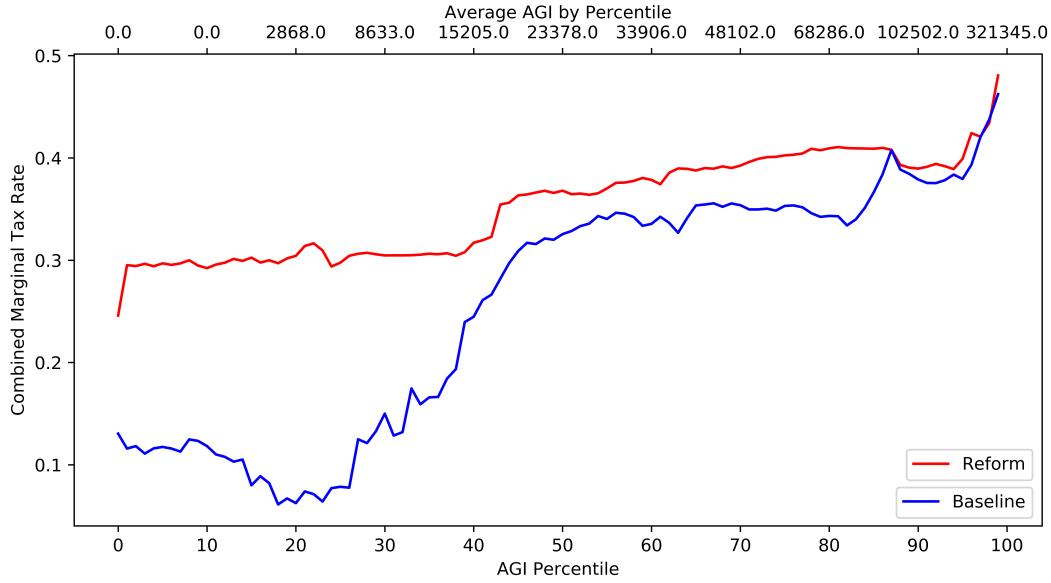
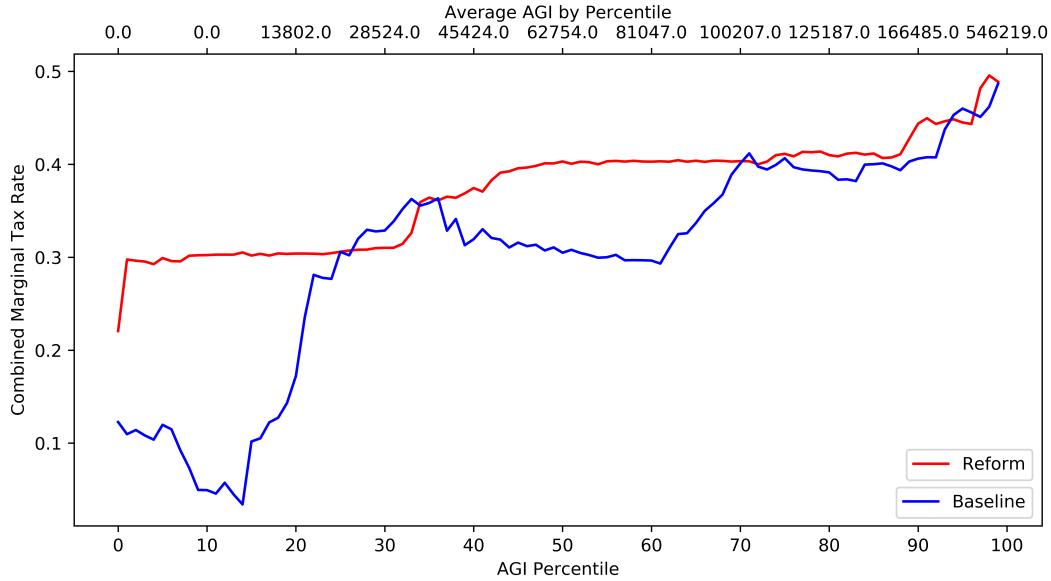


Figure 20: Average Secondary Earner MTR Change by Percentile of AGI



## 8 Tax and Welfare/Transfer Repeal with UBI for All (Dynamic)

To this point, we have assumed no change in behavior stemming from either tax reform or UBI implementation. Using Tax-Calculator's behavioral analysis capabilities, we repeated simulations of a UBI for all, for those above 18, and those above 21. These simulations are accompanied by an income effect of  $-0.05$  and

a substitution effect of 0.24.<sup>11</sup>

Table 7: Tax Liability by Percentile of AGI

	Total Change (\$)	Average Change (\$)	Increase (%)	Share of Change (%)
0-10%	61,675,977,501	3,786	97.71%	4.50%
10-20%	71,584,091,949	4,394	99.96%	5.22%
20-30%	85,240,989,497	5,232	100.00%	6.22%
30-40%	92,981,911,473	5,707	99.98%	6.78%
40-50%	102,443,218,796	6,288	99.99%	7.47%
50-60%	110,728,029,870	6,796	99.98%	8.08%
60-70%	125,580,679,991	7,708	99.98%	9.16%
70-80%	148,652,482,334	9,123	99.89%	10.85%
80-90%	209,496,448,438	12,858	99.73%	15.29%
90-100%	362,161,397,653	22,229	99.37%	26.42%
Sum	1,370,545,227,500		100.00%	

Source: Author's calculations using OSPC calculator.

Implement a taxable UBI for 21 and over that neutralizes the revenue impact on a static basis. Combine with (C). Include the same descriptions/plots/tables as above.

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<sup>11</sup>Our elasticities are based on Harris (2015). Both the tax reform package and UBI policies specified in this paper increase marginal and average tax rates. By itself, the substitution effect dictates this result in a decrease in the labor supply, while the offsetting income effect implies an increase in labor supply.

Figure 21: Average Change in Tax Liabilities by Percentile of AGI

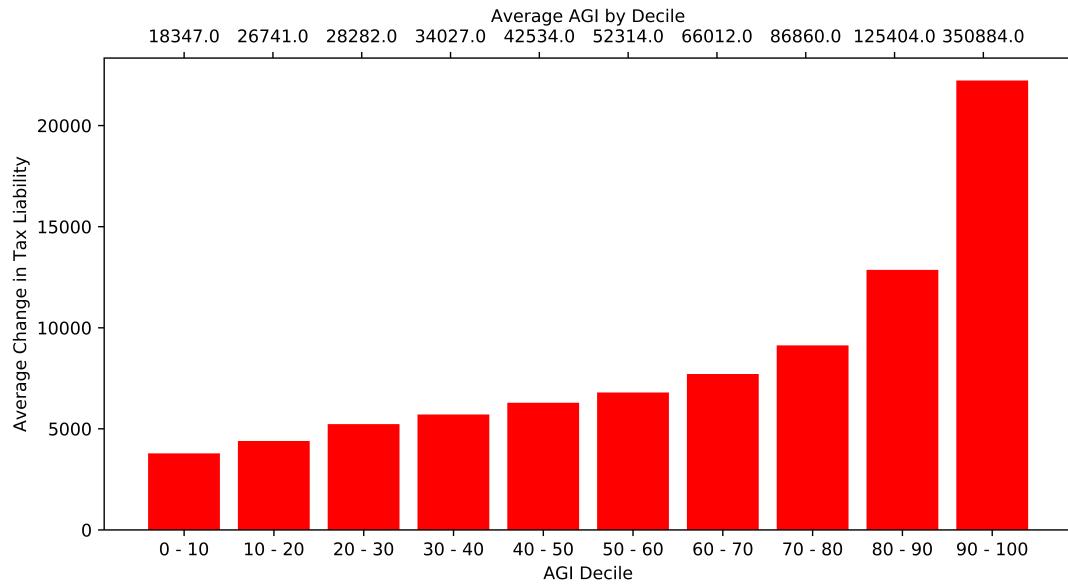


Figure 22: Total Change in Tax Liabilities by Percentile of AGI

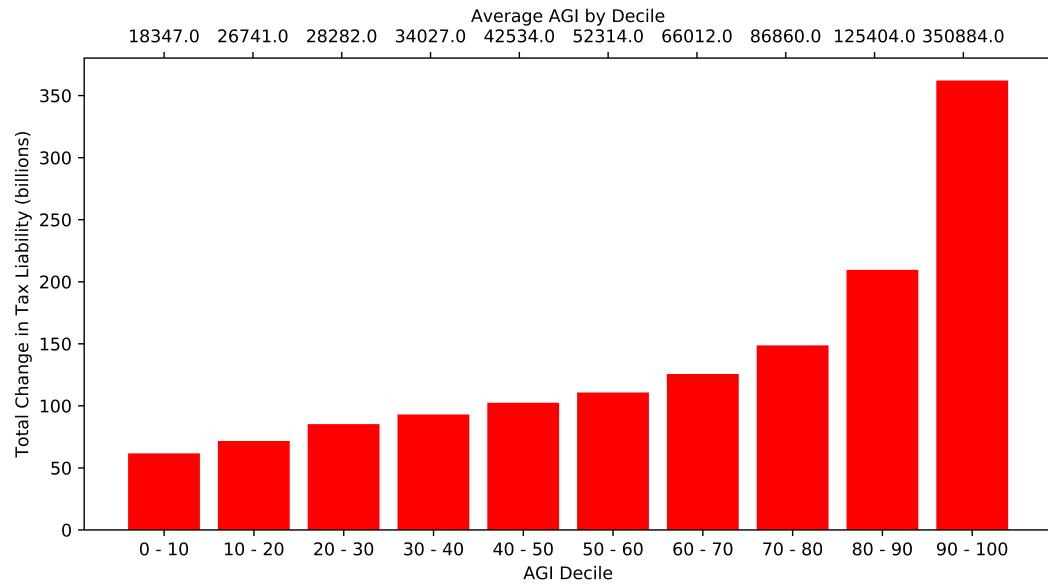


Figure 23: Average Primary Earner MTR Change by Percentile of AGI

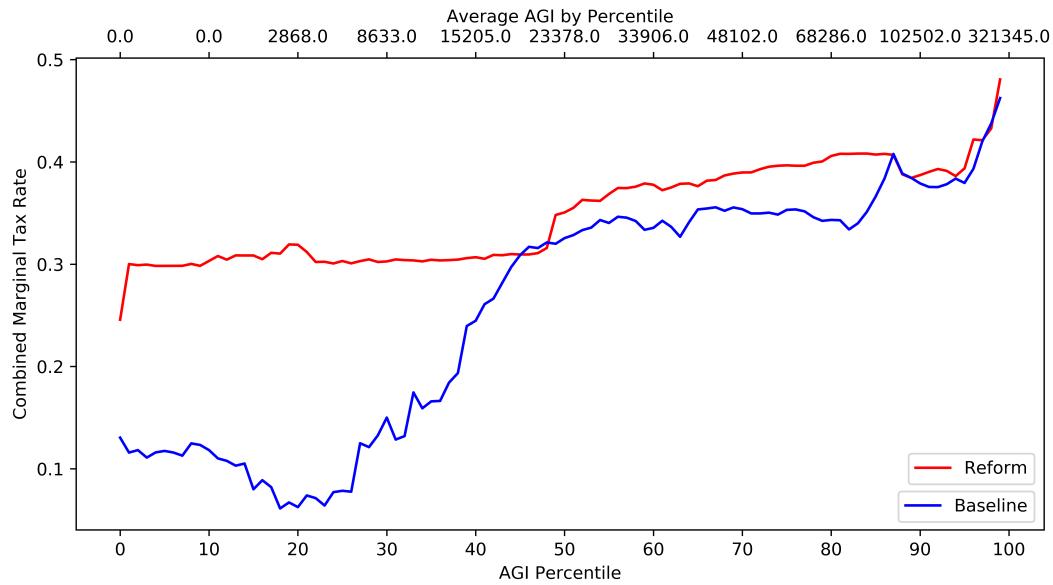
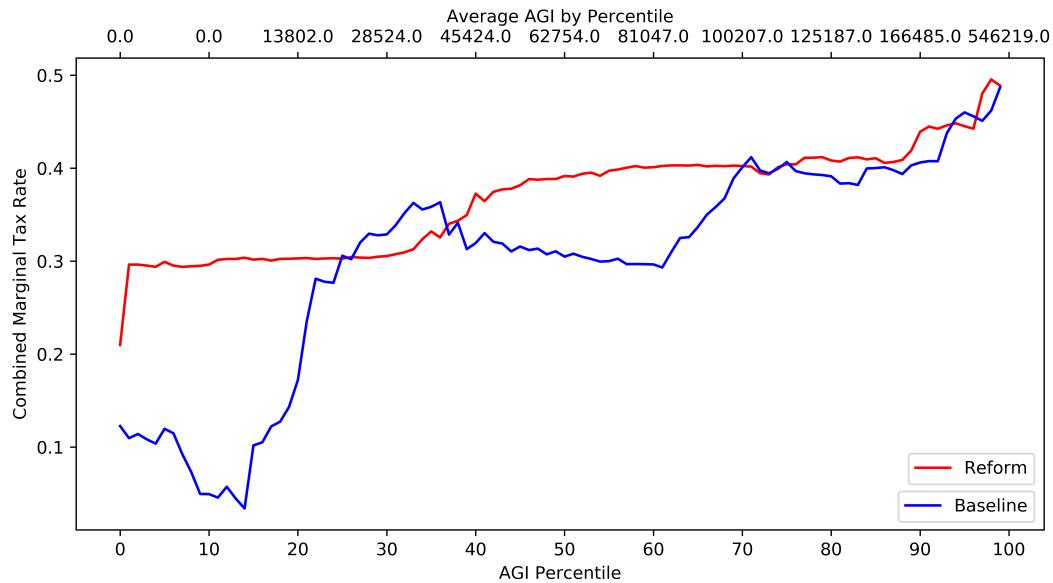


Figure 24: Average Secondary Earner MTR Change by Percentile of AGI



## 9 Tax and Welfare/Transfer Repeal with UBI for 18 Plus (Dynamic)

This section implements a taxable UBI of \$11,490 for individuals 18 years of age and performs a dynamic simulation. Increases in tax liability are similar in both static and dynamic simulations: the static simulation raises total tax liabilities by \$1.364 trillion while the dynamic simulation raises tax liabilities by \$1.371 trillion. Of this increase in tax liability, 26.09% is borne by those in the highest AGI percentile. Those in the lowest AGI percentile only face 3.66% of the total increase in tax liability. This amounts to an average \$3,081 increase for tax units in the lowest income percentile. The following table shows the complete impact of these reforms on liability by AGI percentile.

Table 8: Tax Liability by Percentile of AGI

	Total Change (\$)	Average Change (\$)	Increase (%)	Share of Change (%)
0-10%	50,197,386,535	3,081	97.10%	3.66%
10-20%	67,565,713,514	4,147	99.50%	4.93%
20-30%	88,085,111,679	5,406	99.82%	6.42%
30-40%	95,249,555,923	5,846	99.93%	6.94%
40-50%	106,259,038,769	6,522	99.99%	7.75%
50-60%	113,870,704,622	6,989	99.98%	8.30%
60-70%	128,990,093,495	7,917	99.97%	9.40%
70-80%	152,353,078,150	9,350	99.92%	11.11%
80-90%	211,110,638,500	12,957	99.85%	15.39%
90-100%	357,897,320,225	21,967	99.49%	26.09%
Sum	1,371,578,641,413			100.00%

Source: Author's calculations using OSPC calculator.

The impact of these reforms on tax liability are also shown in the following bar charts. The first shows the average increase in tax liability by AGI percentile, while the second shows the total increase in tax liability by AGI percentile.

Figure 25: Average Change in Tax Liabilities by Percentile of AGI

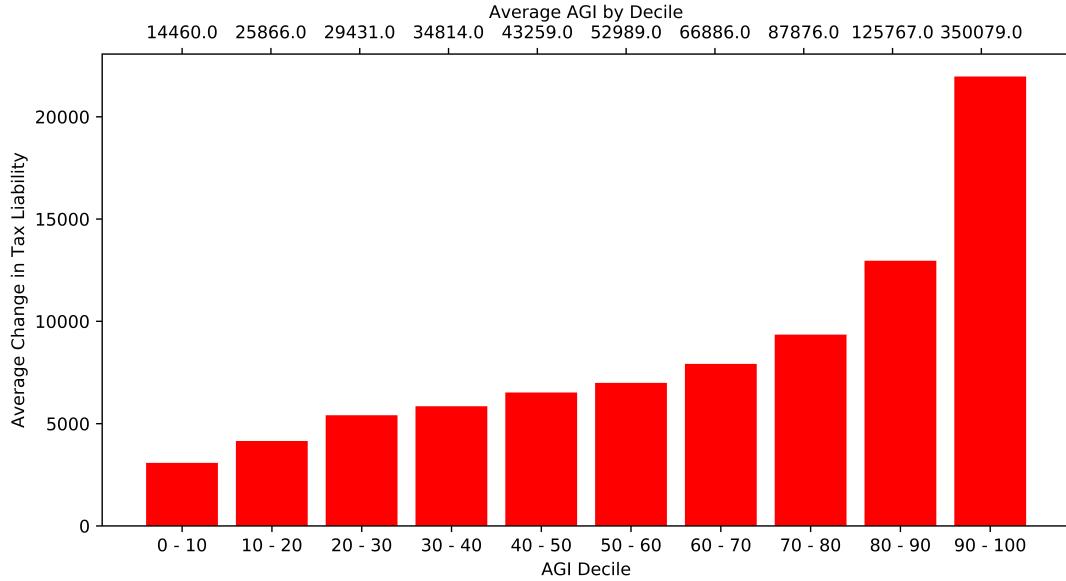
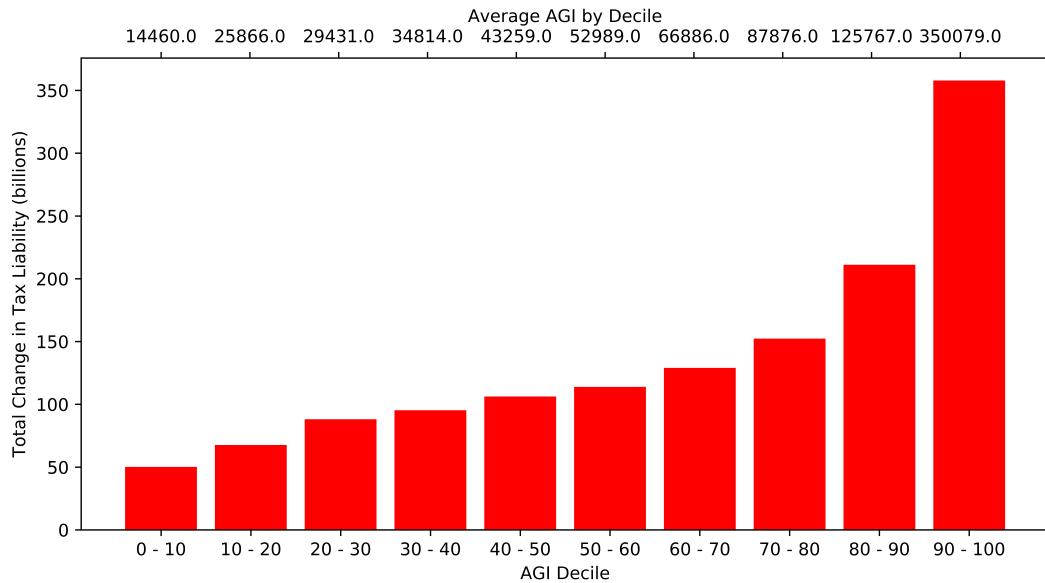


Figure 26: Total Change in Tax Liabilities by Percentile of AGI



These reforms do have a regressive impact on the MTR, raising the MTR for low and medium income earners while leaving the MTR largely unchanged for high income earners. This results in an increase in the MTR of approximately 10 percentage points for primary income earners in the 1 lowest two income percentiles. Primary earners with medium incomes experience an average increase in the MTR of approximately 5 percentage points. Secondary income earners experience an even larger increase in MTR, with an increase

of 20 percentage points for the lowest two income percentiles and an increase of approximately 10 percentage points for those with medium incomes. Those in the 30% to 40% income percentile see little change in their MTR, as the baseline rapidly increases for these individuals. These results are illustrated in the following charts.

Figure 27: Average Primary Earner MTR Change by Percentile of AGI

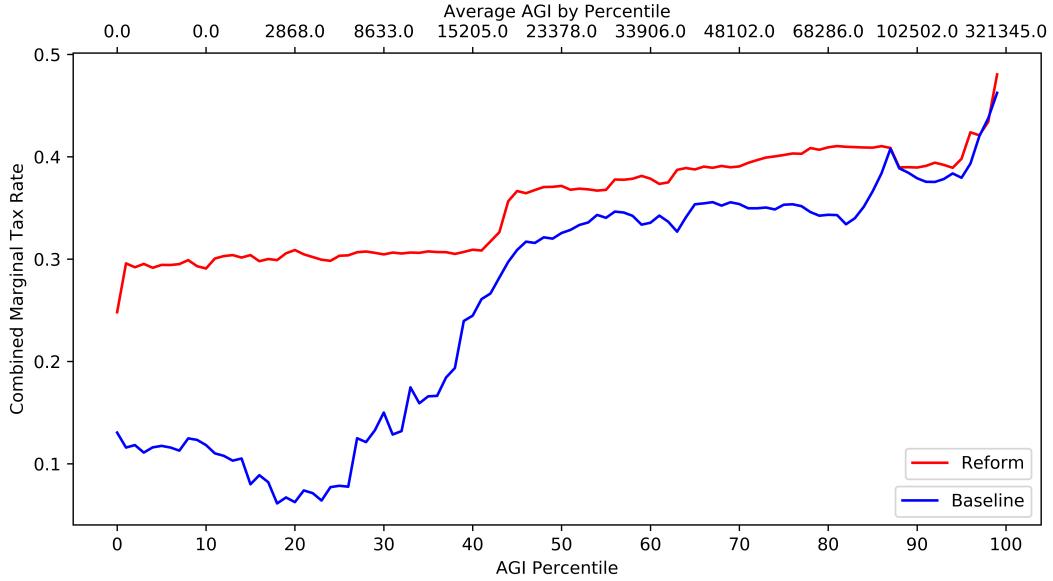
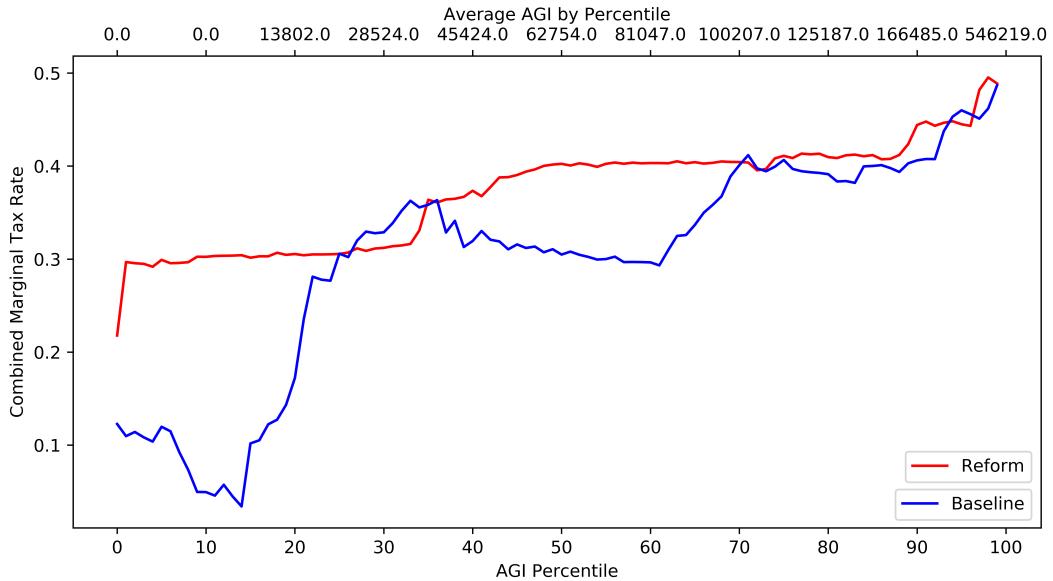


Figure 28: Average Secondary Earner MTR Change by Percentile of AGI



## 10 Tax and Welfare/Transfer Repeal with UBI for 21 Plus (Dynamic)

This section implements a taxable UBI of \$12,126 for those over 21 years of age and performs a dynamic simulation. These reforms increased total tax liabilities by \$1.375 trillion. The increase in tax liability is largest for those with the highest incomes. Of the total increase in tax liabilities, 26.21% are paid by those in the top income percentile. Those with the lowest incomes face a comparatively smaller increase in the tax liability, accounting for 3.45% of the total increase in tax liabilities. This equates to an average increase in \$2,914 for those with the lowest incomes. The following table shows complete results.

Table 9: Change in Tax Liabilities by Percentile of AGI

	Total Change (\$)	Average Change (\$)	Increase (%)	Share of Change (%)
0-10%	47,467,631,170	2,914	96.05%	3.45%
10-20%	64,915,332,040	3,985	99.19%	4.72%
20-30%	86,329,090,278	5,298	99.61%	6.28%
30-40%	95,212,433,509	5,844	99.80%	6.92%
40-50%	106,623,670,980	6,544	99.87%	7.75%
50-60%	114,985,689,721	7,058	99.91%	8.36%
60-70%	130,646,995,021	8,019	99.84%	9.50%
70-80%	154,797,454,874	9,500	99.89%	11.26%
80-90%	213,856,411,959	13,126	99.83%	15.55%
90-100%	360,378,201,193	22,119	99.54%	26.21%
Sum	1,375,212,910,747			100.00%

Source: Author's calculations using OSPC calculator.

The impact of these reforms on tax liabilities are also illustrated in the following charts. The wealthiest have substantially higher average and total tax liabilities under reform.

Figure 29: Average Change in Tax Liabilities by Percentile of AGI

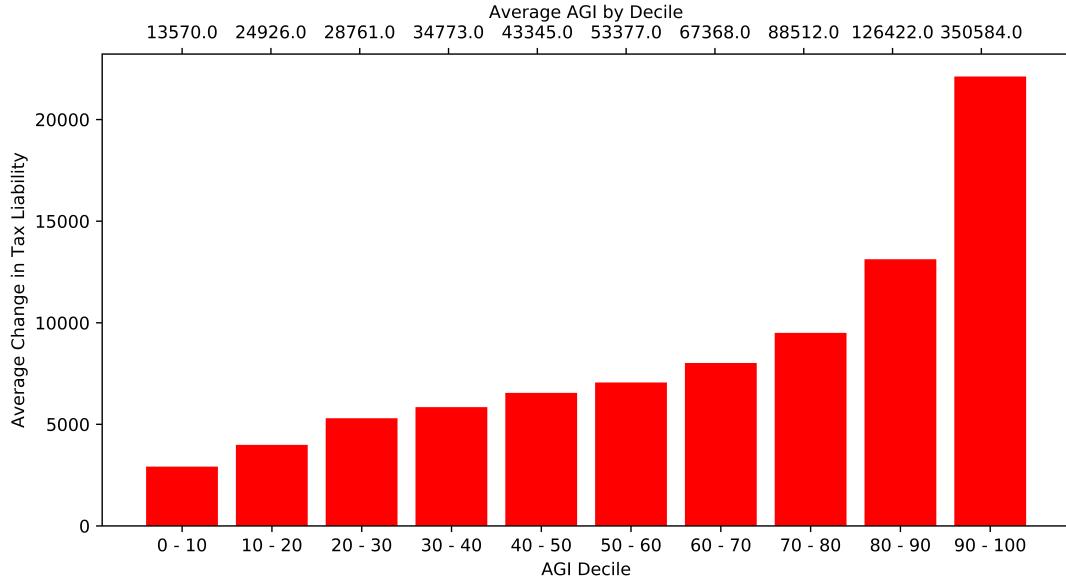
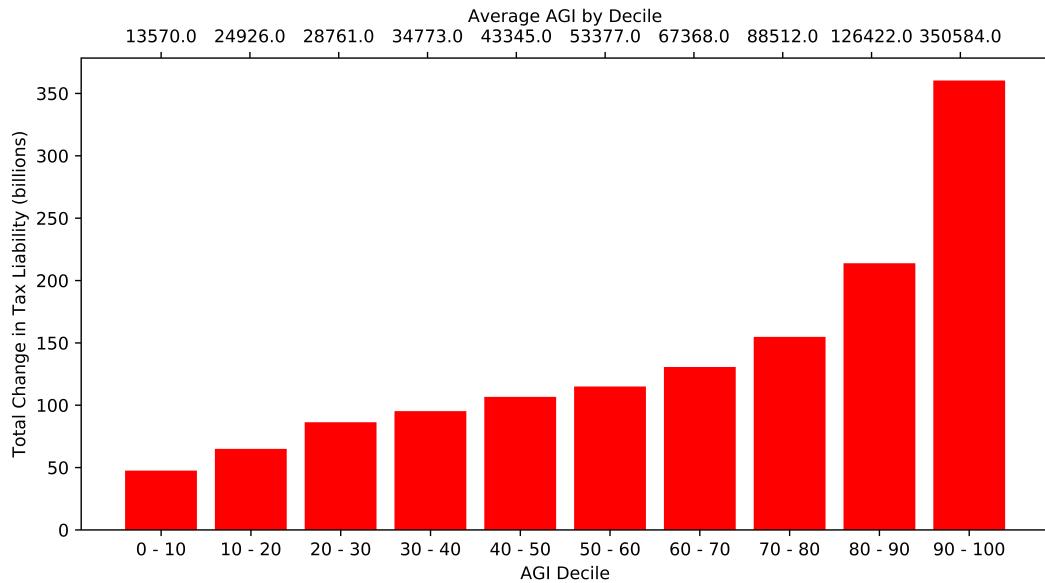


Figure 30: Total Change in Tax Liabilities by Percentile of AGI



These reforms do substantially raise the MTR for low and medium earners while high income earners see their MTR largely unaffected. Primary earners with low incomes experience a large increase in MTR of between 10 and 5 percentage points. Those in the highest income percentile see little to no change in their MTR. Secondary income earners experience similar effects as those seen in the UBI above 18 dynamic simulation, with those in the first two income percentiles experiencing a 20 percentage point MTR increase.

Those in the 30% to 40% income percentile range experience little change in their MTR. Those with middle incomes experience 10 percentage point increases in MTR rates.

Figure 31: Average Primary Earner MTR Change by Percentile of AGI

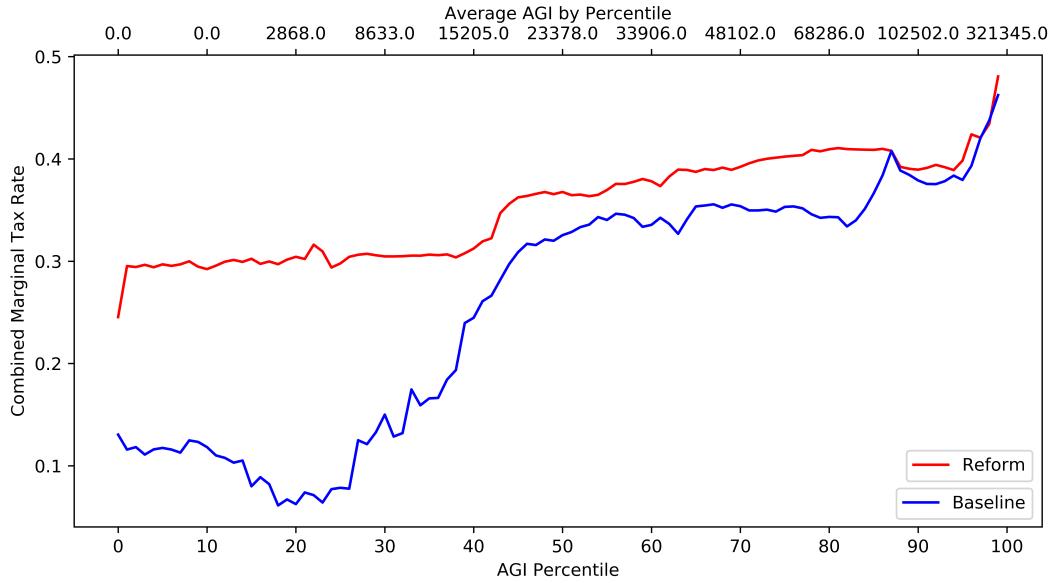
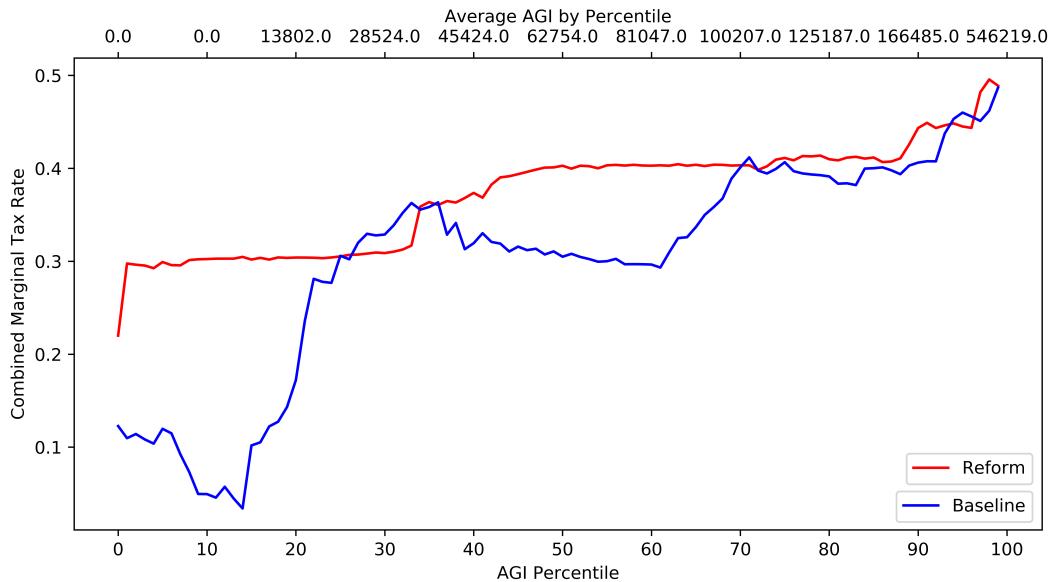


Figure 32: Average Secondary Earner MTR Change by Percentile of AGI



## 11 Adjusted Welfare Calculations

This section evaluates the welfare effects of a UBI for all using dollar-welfare and adjusted baseline welfare calculations. A dollar-welfare measure sets the value of a welfare or transfer program per tax unit equal to the average cost. This method is inaccurate if the recipients do not receive a benefit worth the program's per capita cost because of deadweight loss.<sup>12</sup> The size of the deadweight loss depends on the recipient's infra-marginality with respect to the program's benefit. If the recipient is infra-marginal, meaning they will spend more than a given program's benefit on a good or service, there is little to no welfare loss. In this case, the benefit recipient is going to spend at least as much as the welfare program provides, leaving them to make marginal consumption decisions. If the value of the program exceeds the amount the recipient would pay for a good or service (the recipient is not infra-marginal), a deadweight loss results from the recipient consuming more than they otherwise would. In this case, the recipient would be better off with cash for the value of the benefit exceeding their desired consumption level.<sup>13</sup> This deadweight loss is partially offset by the improved targeting of beneficiaries.

To account for these deadweight losses, we employ welfare multiples that can be applied to each dollar spent on a specific program to approximate the value to recipients. These multiples are derived from the literature.<sup>14</sup> These multiples allow for a more accurate calculation of welfare programs' benefits to individuals.

The following table shows the welfare multiples used in this section.

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<sup>12</sup> O'Higgins (1981) provides the example of educational benefits, which when measured by the cost per capita method would inflate if teachers received increased wages. This would lead to a higher estimated value to students despite the wage increase having no actual impact on education provision. The corollary can also be true when economies of scale are considered: a government may be able to purchase a good or service in bulk and demand a lower price, despite the services being valued more. To avoid these problems, in-kind health care provision should be valued a risk-related insurance approach. Individuals are assigned a dollar benefit (the actuarially fair premium price) based upon average spending according to their age and sex. Callan (2008) explains that consumption of health services is not considered, as this would suggest those most sick and in need of medical treatment have greater resources. Smeeding (1993) writes that the average cost of the benefit may overstate it, as recipients may prefer to spend corresponding cash on other goods and services.

<sup>13</sup> Example: A household receives a heating fuel subsidy for an amount in excess of their desired heating fuel consumption. The household is best off consuming the maximum amount of heating fuel provided by the program although they may be better off restricting their consumption and receiving the remainder of the subsidy in cash (which they could spend on other goods).

<sup>14</sup> See the appendix for a table of welfare multiples from the literature.

Table 10: Welfare Multiples by Program

Program	Welfare Multiple
SSI	0.95
SS	0.95
VB	0.95
SNAP	0.95
Medicaid	0.30
Medicare	0.75

Source: Literature and author's calculations.

The welfare multiples are applied to the dollar value of each transfer program per tax unit. These are then aggregated by percentile of AGI to evaluate the distributional effects of repealing all welfare and transfer programs and implementing a UBI. We assume that the UBI will produce little to no deadweight loss because it is a cash transfer without any means testing. These welfare multiples only account for deadweight losses in the programs themselves and not for any tax effects. The repeal of tax credits and deductions is not accounted for in this paper. We hope to improve on this in later editions.

The following tables and charts illustrate the distributional effects of a UBI for all, accounting for the deadweight loss present in the welfare programs.

Compared to the pure dollar-welfare calculation, the adjusted welfare calculation finds \$5,000 less in welfare for those in the lowest income percentile. This benefit is even greater for households in the 10% to 20% percentile, which have an estimated \$6,000 lower welfare calculation. The full results are in the following table.

Table 11: Dollar Welfare and Adjusted Welfare Calculations

	Average Dollar Welfare	Average Adjusted Welfare	Total Dollar Welfare	Total Adjusted Welfare
0-10%	13,615	10,410	219,112,216,794	167,542,387,450
10-20%	10,905	8,457	175,520,090,477	136,109,800,050
20-30%	9,843	7,520	158,410,286,901	121,026,992,705
30-40%	11,083	8,443	178,394,193,335	135,899,539,526
40-50%	11,157	8,310	179,546,450,821	133,734,244,936
50-60%	10,748	8,066	172,968,959,628	129,805,171,869
60-70%	11,155	8,552	179,567,574,448	137,667,240,483
70-80%	12,188	9,344	196,152,271,759	150,380,364,956
80-90%	13,342	10,168	214,754,788,881	163,660,746,430
90-100%	14,996	11,331	241,350,753,576	182,370,420,476

The following three tables show the average and total welfare resulting from removing all welfare and transfer programs, closing loopholes, and ending tax credits, and implementing a UBI. Each table shows a different implementation scheme: UBI for all, for 18 and above, and for those 21 and above. In all situations, those in the lowest income percentile experience a welfare loss, while those in the lower-to-middle income percentiles experience a welfare gain.

Table 12: Average Welfare by Percentile

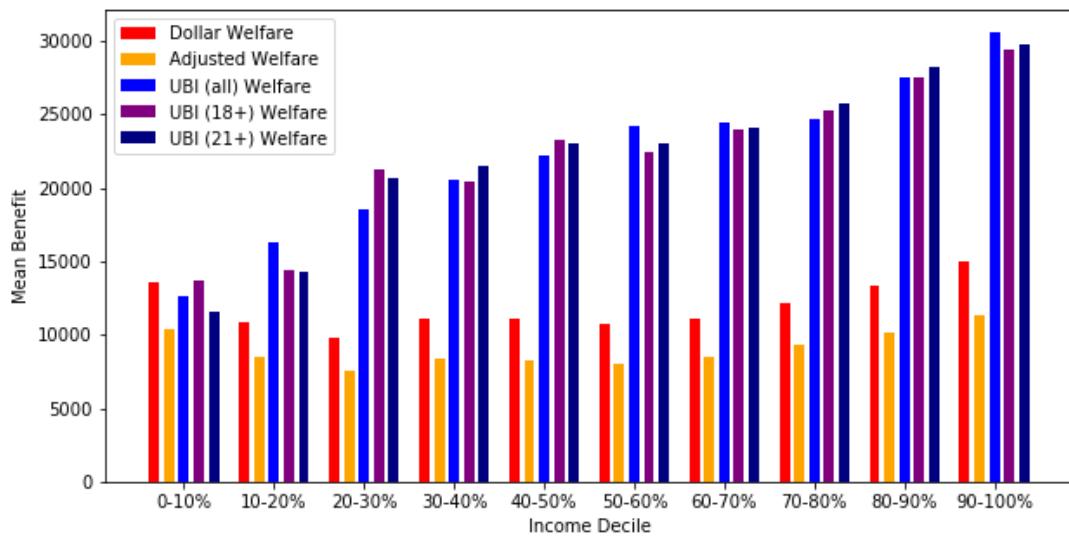
	Adjusted Welfare	UBI (all)	UBI (18+)	UBI (21+)
0-10%	10,410	12,597	13,659	11,560
10-20%	8,457	16,289	14,454	14,340
20-30%	7,520	18,539	21,259	20,645
30-40%	8,443	20,535	20,392	21,464
40-50%	8,310	22,152	23,268	23,035
50-60%	8,066	24,219	22,405	23,052
60-70%	8,552	24,403	23,946	24,123
70-80%	9,344	24,709	25,308	25,717
80-90%	10,168	27,558	27,529	28,183
90-100%	11,331	30,577	29,422	29,748

Table 13: Total Welfare by Percentile

	Adjusted Welfare	UBI (all)	UBI (18+)	UBI (21+)
0-10%	167,542,387,450	205,220,409,254	222,529,084,989	188,338,978,609
10-20%	136,109,800,050	265,387,221,672	235,488,624,400	233,626,150,158
20-30%	121,026,992,705	302,059,489,138	346,377,741,848	336,335,897,483
30-40%	135,899,539,526	334,580,938,167	332,211,925,806	349,728,362,052
40-50%	133,734,244,936	360,905,863,307	379,117,642,873	375,275,105,079
50-60%	129,805,171,869	394,581,317,316	365,018,177,657	375,564,808,184
60-70%	137,667,240,483	397,567,164,661	390,124,874,679	393,008,324,024
70-80%	150,380,364,956	402,594,034,865	412,346,434,775	419,003,568,567
80-90%	163,660,746,430	448,958,648,931	448,505,318,605	459,188,537,236
90-100%	182,370,420,476	498,215,614,463	479,384,290,086	484,668,653,532

The following bar chart illustrates the welfare effects of implementing a range of UBI schemes, compared with the baseline dollar-welfare and adjusted welfare calculations. When viewed against the dollar-welfare calculation, the UBI for all does not increase welfare for the lowest income percentile. However, when this is compared with the adjusted welfare calculation, the UBI does result in increased welfare.

Figure 33: Welfare Effects of UBI



Welfare only includes government transfer and transfer programs.

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## 12 Appendix

### 12.1 OSPC's Tax Calculator

OSPC's Tax-Calculator is an open source microsimulation tax model that can be used to simulate changes to federal tax policy to conduct revenue scoring, distributional impact, and, as seen in this paper, the implementation of a universal basic income. The model is continually being updated as contributions are made, so the results from the calculations seen in this paper may change as improvements are merged in.

### 12.2 Data

This paper utilizes two sets of data: the 2009 IRS Public Use File (PUF) and the 2014 Current Population Survey (CPS). The CPS was modified to include the imputed welfare benefit data used in Part A so we can assess the benefits paid out for specific programs.

Part A uses only the modified CPS data after it has undergone a procedure to create tax unit equivalents. At a high level, it is assumed that there is at least one tax unit per household in the CPS, and each household can be categorized in one of three ways: single persons living alone, individuals living in group quarters, and all other family structures.

In the first two structures, each individual is assumed to be one tax unit. For all other household types, the program iterates through each individual in the household, building a tax unit from the relationships implied by the data.

The code for the tax unit creation process is available on GitHub.

After the CPS based tax units are created, a fully constrained, predictive mean matching process is performed between the CPS file and the PUF to create a final matched-PUF file. The matching procedure partitions the CPS and PUF files across several dimensions and matches the two files within each dimension to create fully representative tax units. The dataset is then extrapolated in three stages.

Stage one uses per capita adjustment factors derived from the CBO economic outlook to ensure the aggregated variables match macroeconomic growth rate projections. In stage two, a linear programming algorithm is applied to adjust the weights on each record so that specified variables sum up to their targets. Stage three applies adjustment ratios to targeted variables to fine-tune their distribution so that it is consistent with that found in publicly available IRS data.

## 12.3 Welfare and Transfer Programs

The following table shows the welfare and transfer programs programs were cut as part of the reforms.

Table 14: Welfare Programs Cut

Program	Cost (million \$)
Railroad retirement (excl. social security )	8,803
Unemployment Assistance	43,504
Children's health insurance	9,317
Indian health	4,510
Health resources and services	7,604
Substance abuse and mental health services	3,193
Center for Medicare and Medicaid Innovation	997
Refundable Premium Tax Credit and Cost Sharing Reductions	13,068
Other	12,834
Student assistance–Department of Education and other	56,337
Housing assistance	46,600
Child nutrition and special milk programs	19,490
Supplemental feeding programs (WIC and CSFP)	6,266
Commodity donations and other	823
Family support payments to States and TANF	20,378
Low income home energy assistance	3,537
Payments to States for daycare assistance	5,064
Veterans non-service connected pensions	5,251
Payments to States–Foster Care/Adoption Assist.	6,868
Payment where child credit exceeds tax liability	21,490
Other public assistance	1,071
Coal miners and black lung benefits	426
Aging services programs	1,462
Energy employees compensation fund	1,052
September 11th victim compensation	49
Refugee assistance and other	4,403
Farm income stabilization (351)	20,012
Agricultural research and services (352)	4,374
Community development (451)	7,896
Area and regional development (452)	3,027
Disaster relief and insurance (453)	9,747
Social services (506)	17,299
Medicare	505,053
Medicaid	401,201
SSI	56,068
SNAP	69,313
Social Security	749,467
Veterans' Benefits	134,672

## 12.4 Benefit Data Imputation

Benefit and participation levels for welfare and transfer programs are consistently underreported in the Current Population Survey, making it difficult to get a true dollar figure for the cost of each program. To account for this, individual benefit levels for Supplemental Security Income (SSI), Supplemental Nutrition Assistance Program (SNAP), Veterans' Benefits, Social Security, Medicare, and Medicaid were imputed using the open-source CPS Transfer Augmentation Model (C-TAM). C-TAM corrects for under-reported benefit use, imputes benefit payments where they are excluded, and imputes the marginal tax rate of these welfare and transfer programs. C-TAM can be found on GitHub.

## 12.5 Welfare Multiples

Welfare multiples were drawn from the literature when possible. Little work has been done on Veterans' Benefits, requiring the author to approximate the welfare cost. This was done by aggregating the welfare multiples from other government programs that provide similar services included in Veterans' Benefits. The Veteran's Benefits Association (VBA) Annual Benefits Reports provides a convenient basis for accomplishing this, dividing the benefits into size sections: compensation, pension and fiduciary, education, vocational rehabilitation and employment, insurance, and home loan guaranty. The amount spent on these programs in FY2014 is shown in the following table, along with the share of spending.<sup>15</sup>

Table 15: Total Program Expenditures (2014)

Program	Dollars (millions)	Percent of Total	Welfare Multiple
Compensation	64,356	74.55	0.99
Pension and Fiduciary	5,462	6.33	0.95
Education	12,292	14.24	1.00
Vocational Rehabilitation and Employment	1,063	1.23	0.50
Insurance	1,117	1.29	0.50
Home Loan Guaranty	2,031	2.35	0.50
Total	86,321	100.00	0.96

Source: Drawn from literature and author's calculations.

Compensation includes service-connected disability or death benefits. Pension and fiduciary includes veterans' non-service-connected pension and survivor's pension. Education includes all education benefit

<sup>15</sup>Veterans Benefits Administration. *Annual Benefits Report: Fiscal Year 2014*.

programs for veterans. Insurance includes the veterans' life insurance program. Home loan guaranty helps eligible veterans, active duty personnel, surviving spouses, and members of reserves and National Guard purchase, retain, and adapt homes. Vocational rehabilitation helps veterans who are unable to gain secure employment due to their service connected disabilities.

The vast majority of expenditures (75.55%) are on compensation – essentially transfer payments. These payments are exempt from tax and can be paid to the Veteran or their surviving beneficiary.<sup>16</sup> These benefits are paid out in scales according to injury and disability, thus there could be a discrepancy between the prescribed amount and actual amount, causing a welfare loss. Because these are transfer payments, the welfare cost should be relatively small. Given SSI is assumed to have a welfare multiple of 0.99, we use that for VB compensation as well.

Education benefits are the second largest segment of program expenditures (14.24%). Angrist (1993) finds that use of Veterans' Benefits (specifically education benefits) raises annual earnings by 6%.<sup>17</sup> 77% of those that attend college or graduate school under Veterans' Benefits receive this premium. The author performs simple calculations with a discount of 10% a year, finding that over one's working life the premium of a discounted 1986 dollar value was 17,717 dollars. The author concludes that Veterans' Benefits do not appear to be socially wasteful.<sup>18</sup> This suggests the welfare multiple for education benefits is close to one, if not above one.

Pension and fiduciary are responsible for 6.33% of spending. These programs provide similar benefits to the Social Security program, which has an approximated welfare multiple of 0.95. We feel this is reasonable to apply to the pension and fiduciary part of Veterans' Benefits.

The remaining sections make up a relatively small portion of VA benefits expenditures (.88%, total). If these programs are assumed to have a welfare multiple of zero, the weighted average welfare multiple across sections is 0.95%. If we assume at least a welfare multiple of 0.50 for these programs – that is at least 50 cents for every dollar of spending – then the welfare multiple rises to 0.97. A conservative estimate would have the welfare multiple somewhere between 0.95 and 0.97, say 0.96.

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<sup>16</sup>Veterans Benefits Administration. "Annual Benefits Report: Compensation."

<sup>17</sup>Angrist, Joshua D. "The Effect of Veterans Benefits on Education and Earnings." ILR Review. Vol. 46, No. 4 (Jul., 1993), pp. 637-652.

<sup>18</sup>Ibid.

Table 16: Welfare Multiples

Program	Author	Years	Findings
Social Security	Hong and Rios-Rull (2006)	0.87755 <sup>1</sup> , 0.87866 <sup>2</sup>	<sup>1</sup> Uses consumption equivalence compared to the steady-state; <sup>2</sup> Uses consumption born interpolation.
Social Security	Peterman and Sommer (2014)	0.925	Measures ex ante welfare of expected lifetime consumption (CEV).
Social Security	Feldstein (1974)	11% of GNP	
Social Security	Hubbard and Judd (2017)	0.9625, 0.9597	Range depends on specification.
Social Security	Storesletten, Telmer, and Yaron (1999)	0.9625 <sup>4</sup> , 0.9597 <sup>5</sup>	<sup>4</sup> Abolishing system; <sup>5</sup> Privatizing 1/2 system.
Social Security	Auerbach and Kotlikoff (1987)	6% of full-time resources.	
Social Security	İmrohoroglu, İmrohoroglu, and Joines (1995)	-2.08% of GNP from removing Social Security.	
SNAP	Smeeding (1982)	0.97	
SNAP	Moffitt (1989)	1.00	
SNAP	Whitmore (2002)	0.80	
Medicare	Lustig (2009)	0.78	For Medicare Part C.
Medicare	Hall (2007)	0.72	For Medicare HMOs.
Medicare	Finkelstein and McKnight (2008)	0.45, 0.75	Range defends on specification.
Medicaid	Finkelstein, Hendren, and Luttmier (2015)	0.20, 0.40	Range defends on specification.
Medicaid	Gallen (2015)	0.24, 0.35	Range defends on specification.
Medicaid	Liber and Lockenwood (2013)	0.91, 0.98	For the Medicaid Home Care program.
Housing	Desmond and Perkins (2016)	0.90	Uses HCV program in Milwaukee.
Housing	Apgar (1990)	0.87	
SSI	Peterman and Sommer (2014)	0.98	