A Budget-Neutral Universal Basic Income

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Abstract

This report is the first in a series of papers that will analyze the economic impact of Universal Basic Income (UBI) proposals. In this report, we simulate a three-part policy reform: (1) repeal most welfare and transfer programs, including Social Security and Medicare (2) repeal most base-narrowing features of the individual income tax system, and (3) replace those programs with a UBI on a budget-neutral basis.

We calculate the value of the UBI and report how the reform affects taxpayers by income group and age. We also draw from the welfare literature to show that a noncash benefit costing the government a dollar might not be worth a dollar to the recipient.

This is the first analysis to combine three essential open source models. We use Tax Calculator and Tax Data to estimate the consequences of the tax provisions, and we use the new Current Population Survey (CPS) Transfer Augmentation Model (C-TAM) to estimate the consequences of repealing welfare and transfer programs.

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Reform

We model a policy reform that repeals most welfare and transfer programs (benefit programs) and base-narrowing features of the individual income tax system in favor of a Universal Basic Income (UBI). The UBI is calibrated to neutralize the budgetary effect of the reform including taxes collected on UBI income, which would be taxable. Individuals under 18 receive a UBI that is one-half of that received by individuals 18 and over.

This reform repeals 20 benefits programs, which are listed in Appendix A. A selection of major benefits programs—Medicare, Medicaid, Social Security, Veterans Benefits (VB), Supplemental Nutrition Assistance Program (SNAP), and Supplemental Security Income (SSI)—are modeled using Transfer Augmentation Model (C-TAM), and the benefits totals are assigned to individuals in the Current Population Survey (CPS). Benefit payments for these programs total $2.17 trillion in 2014. We also repeal many smaller programs using total outlays reported by the Office of Management and Budget. Payments for these programs total just over $366 billion. In the distributional analysis later in this paper, we assume the distribution of the nonmodeled programs matches that of a subset of the modeled benefits: Medicaid, VB, SNAP, and SSI. Combined, the repeal of these programs frees up $2.54 trillion for a UBI in 2014.

The reform also repeals 23 provisions in the federal individual income tax code, listed in Table 1, which we model with Tax Calculator and Tax Data. In total, the base-broadening tax reform increases tax liabilities by $649 billion in 2014. We do not repeal several provisions because of lack of data, including the exclusion for employer-provided health insurance.

Table 1. Repealed Tax Provisions

Section	Provision
Above-the-Line Deductions	Educator Expenses Deduction Health Savings Account Contribution Deduction Self-Employment Tax Deduction Self-Employment Health Insurance Deduction Forfeited Interest Payment Deduction Alimony Payment Deduction Individual Retirement Account Contribution Deduction Student Loan Interest Deduction Tuition and Fees Deduction Payment to Keogh or SEP Plan Deduction Domestic Production Deduction
Exemptions	Personal and Dependent Exemptions
Standard and Itemized Deductions	Standard Deduction Itemized Deduction (Medical Expense, Miscellaneous, State and Local, Interest Paid, and Casualty)
Credits	Retirement Saving Credit Child and Dependent Care Credit Residential Energy Credit General Business Credit Child Tax Credits Education Credits (American Opportunity, Lifelong Learning) Earned Income Credit Previous Year Minimum Tax Credit

Source: Author.

Results

Together, repealing the benefit programs and tax reform frees up $3.21 trillion for a UBI. After accounting for the additional revenue gained by making the UBI taxable, this is sufficient to finance a UBI of $13,788 for individuals 18 or older and $6,894 for individuals under 18.

In this section, we analyze the distributional impact of the reform by age and income group under two core alternative frameworks. The first framework (Scenario 1) assumes that individuals fully value the payments from benefit programs—in other words, if the government spends a dollar on the benefit, then the individual receives a dollar worth of value. The alternative framework (Scenario 2) assumes that benefits that cost the taxpayer a dollar may be worth less than a dollar to the recipient.

The results of both scenarios are static and exclude any behavioral feedback or macroeconomic effects. Future papers in this series will incorporate those elements.

Scenario 1. In the first scenario, we assume that individuals receive the full value of the government's spending on benefits. Table 2 shows the reform's impact on all tax units, broken down by the wage and salary of the tax unit. As expected, lower earners see the biggest losses from repealing the benefits while most of the new tax liabilities fall on the upper end of the wage spectrum. Notably, tax units with wages

above $1 million have an average increase in tax liability of $149,000. With the benefit loss and liability changes combined, the lowest bracket (wage income $0–$10,000) and the top bracket ($1 million or over) are made worse off, while all others are better off. The average UBI per tax unit increases as wages increase because the average tax unit size increases with income.

The average benefit change for the highest income bin is larger than the benefit change for the second highest income bin. This is because we have records for very few households with wage and salary income over $1,001,000 in the dataset that we use to model the benefits repeal, and at least one of the households participated in Medicaid and SNAP—likely because it had low income for part of the year—and another of the households had high VB.

Table 2. Reform Results for All Tax Units, by Size of Wage and Salaries (WAS)

WAS Floor	**Tax Unit Stats**		**Average UBI**		**Average Benefits Change**	**Average Tax Liability Change**	**Combined UBI, Tax Reform, Benefits Repeal**
	Total (Millions)	*Average Size*	*Per Person*	*Per Tax Unit*			
$0	76.51	1.93	$12,122	$22,483	–$24,481	$4,958	–$6,956
$10,000	16.16	1.64	$12,542	$20,158	–$9,848	$6,714	$3,596
$20,000	13.74	1.74	$12,228	$20,968	–$9,195	$7,640	$4,134
$30,000	11.09	1.76	$12,583	$21,312	–$7,812	$8,169	$5,330
$40,000	8.54	1.80	$12,668	$21,918	–$8,502	$8,814	$4,602
$50,000	15.35	2.01	$12,684	$24,490	–$7,297	$10,607	$6,586
$75,000	9.02	2.44	$12,409	$28,970	–$5,679	$13,914	$9,376
$100,000	13.72	2.77	$12,184	$32,325	–$5,619	$17,875	$8,831
$200,000	4.32	3.09	$11,960	$35,307	–$5,368	$28,425	$1,514
$1,001,000	0.17	3.15	$12,024	$36,026	–$8,281	$148,695	–$120,951

Source: Author's calculations using OSPC calculator.

Table 3 displays the distributional impact of the reform for tax units with at least one individual over 65 years old. A significant portion of total benefit payments—particularly those for Social Security and Medicare—accrue to tax units with at least one member 65 years old or older. As a result, the current cohort of these tax units are uniformly disadvantaged by a reform that repeals welfare and transfer programs and replaces them with a UBI. This is likely to be a transitional effect, as future tax units can fund retirement saving and health insurance through their UBI, but further analysis would be needed to know what is likely to happen to future retirees.

Table 3. Reform Results for Tax Units with Individuals Age 65 or over, by WAS

WAS Floor	Tax Unit Stats		Average UBI		Average Benefits Change	Average Tax Liability Change	Combined UBI, Tax Reform, Benefits Repeal
	Total (Millions)	*Average Size*	*Per Person*	*Per Tax Unit*			
$0	29.33	1.73	$13,437	$22,947	-$46,090	$4,718	-$27,861
$10,000	3.42	1.95	$13,507	$26,128	-$34,960	$7,838	-$16,670
$20,000	2.73	1.99	$13,548	$26,742	-$34,863	$8,500	-$16,621
$30,000	0.93	2.00	$13,518	$26,748	-$33,526	$7,677	-$14,456
$40,000	0.54	2.00	$13,423	$26,428	-$36,390	$7,195	-$17,157
$50,000	0.87	2.03	$13,524	$27,146	-$31,962	$8,163	-$12,979
$75,000	0.44	2.00	$13,542	$26,859	-$31,104	$9,227	-$13,471
$100,000	0.52	2.09	$13,530	$28,047	-$33,951	$12,378	-$18,282
$200,000	0.17	2.00	$13,621	$27,022	-$29,537	$23,433	-$25,948
$1,001,000	0.01	1.90	$13,788	$26,222	-$22,774	$137,770	-$134,323

Source: Author's calculations using OSPC calculator.

After excluding tax units with individuals 65 or over, all income groups but those earning more than $1 million see a net-positive change from the policy, as shown in Table 4.

Table 4. Reform Results for Tax Units with Individuals Under 65, by WAS

WAS Floor	Tax Unit Stats		Average UBI		Average Benefits Change	Average Tax Liability Change	Combined UBI, Tax Reform, Benefits Repeal
	Total (Millions)	*Average Size*	*Per Person*	*Per Tax Unit*			
$0	47.19	2.05	$11,305	$22,195	–$13,757	$5,107	$3,331
$10,000	12.74	1.56	$12,284	$18,558	–$6,833	$6,413	$5,312
$20,000	11.01	1.68	$11,900	$19,535	–$6,321	$7,426	$5,788
$30,000	10.16	1.74	$12,498	$20,816	–$4,802	$8,214	$7,799
$40,000	8.01	1.79	$12,617	$21,616	–$5,175	$8,923	$7,518
$50,000	14.47	2.01	$12,633	$24,330	–$4,376	$10,755	$9,199
$75,000	8.58	2.46	$12,351	$29,077	–$3,171	$14,153	$11,753
$100,000	13.21	2.80	$12,132	$32,493	–$3,003	$18,090	$11,399
$200,000	4.15	3.14	$11,893	$35,642	–$2,664	$28,627	$4,351
$1,001,000	0.16	3.25	$11,892	$36,762	–$6,497	$149,515	–$119,251

Source: Author's calculations using OSPC calculator.

Scenario 2. In this section, we take a closer look at the value of noncash welfare and transfer benefits to the recipient, focusing on the largest noncash programs—Medicare, Medicaid, and VB. The value of benefits to individuals could be lower than the cost to the government because of the deadweight losses in the provision of the program.[1] If the recipient will spend more than a given program's benefit on a good

[1] Michael O'Higgins provides the example of educational benefits. If education benefits are measured using the cost per capita method, then welfare will appear to increase if teachers receive higher wages. This leads to a higher estimated value to students, despite wage increases having no direct 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 having a higher welfare value. To avoid these problems, in-kind health care provision should be valued using a risk-related insurance approach. Using this method, individuals are assigned a dollar benefit (the actuarially fair premium price) based on average spending according to their age and sex. See Michael O'Higgins and Patricia Ruggles, "The Distribution of Public Expenditures and Taxes Among Households in the United Kingdom," *Review of Income and Wealth* 27, no. 3 (June 1981), http://onlinelibrary.wiley.com/doi/10.1111/j.1475-4991.1981.tb00207.x/full. Tim Callan explains that individual consumption of health services should not be considered, because it would suggest that those most sick and in need of medical treatment have greater resources. See Tim Callen and Claire Keane, "Non-Cash Benefits and the Distribution of Economic Welfare," *Economic and Social Review* 40, no. 1 (January 2008), http://ftp.iza.org/dp3954.pdf. Timothy Smeeding writes that the average cost of the benefit may overstate it, as recipients may prefer to spend corresponding cash on other goods and services. See Timothy M. Smeeding et al., "Poverty, Inequality, and Family Living Standards Impacts Across Seven Nations: The Effect of Noncash Subsidies for Health, Education and Housing," *Review of Income and Wealth* 39, no. 3 (September 1993), http://www.roiw.org/1993/229.pdf.

or service (the recipient is inframarginal), then there is little to no deadweight loss. The recipient will spend at least as much as the benefit program provides and will make marginal consumption decisions using his or her own resources. If the value of the program exceeds the amount the recipient would pay for a good or service (the recipient is not inframarginal), then deadweight loss results from the recipient consuming more than he or she otherwise would. In this case, the recipient would be better off if the portion of the benefit exceeding their desired consumption level was replaced with a cash payment.[2]

To account for these deadweight losses, we apply welfare multiples that approximate the value to recipients of each dollar spent on the program. We derive these multiples from the literature[3] (when available) or approximate them using similar programs.[4] Cash transfer programs generally do not have large welfare losses, so we assign them welfare multiples of one. The multiples we use for each in-kind program are shown in Table 5.

Table 5. Welfare Multiples by Program

Program	Welfare Multiple
VB	0.95
Medicaid	0.30
Medicare	0.75

Source: Literature and author's calculations.

We apply the welfare multiples to the dollar value of each transfer program by tax unit. The tax units are then aggregated to wage and salary bins to evaluate the distributional effects of repealing all welfare and transfer programs and implementing a UBI.

These welfare multiples only account for deadweight losses from VB, Medicaid, and Medicare. We assign welfare multiples of one to the other welfare and transfer programs, tax reform, and the UBI.

Table 6 shows the welfare results of these reforms by income bins. Compared with the results in Scenario 1, the average benefits in this scenario are smaller because of using the welfare multiples. These reduce the dollar welfare value of VB, Medicaid, and Medicare, resulting in smaller reductions in welfare from their repeal. Tax units in the lowest income bin lose $20,390 in adjusted welfare benefits while their tax liabilities increase by $4,958. This results in a total welfare reduction of $25,348. This is supplemented with a $22,483 UBI per tax unit, resulting in a net welfare reduction of $2,865 in the lowest income bin. Tax units in the highest income bin see benefit reductions of $7,743, and tax liabilities increase by

[2] For example, suppose members of a household receive a heating fuel subsidy for an amount in excess of their desired heating fuel consumption. They are 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.

[3] See Appendix B for a summary of welfare multiples from the literature.

[4] No welfare multiple for VB is available in the literature. The methodology for approximating a welfare multiple is outlined in Appendix C.

$148,695. With an average per unit UBI of $36,026, units in the top tax unit experience a net welfare loss of $120,413. All other income bins experience a net welfare increase, with those making above $75,000 experiencing the largest net welfare increase of $10,238.

Table 6. Reform Results for All Tax Units, by WAS

WAS Floor	Tax Unit Stats		Average UBI		Average Adjusted Benefits Change	Average Tax Liability Change	Adjusted Combined UBI, Tax Reform, Benefits Repeal
	Total (Millions)	*Average Size*	*Per Person*	*Per Tax Unit*			
$0	76.51	1.93	$12,122	$22,483	–$20,390	$4,958	–$2,865
$10,000	16.16	1.64	$12,542	$20,158	–$7,795	$6,714	$5,649
$20,000	13.74	1.74	$12,228	$20,968	–$7,281	$7,640	$6,048
$30,000	11.09	1.76	$12,583	$21,312	–$6,286	$8,169	$6,856
$40,000	8.54	1.80	$12,668	$21,918	–$6,807	$8,814	$6,297
$50,000	15.35	2.01	$12,684	$24,490	–$5,963	$10,607	$7,919
$75,000	9.02	2.44	$12,409	$28,970	–$4,818	$13,914	$10,238
$100,000	13.72	2.77	$12,184	$32,325	–$4,819	$17,875	$9,631
$200,000	4.32	3.09	$11,960	$35,307	–$4,717	$28,425	$2,164
$1,001,000	0.17	3.15	$12,024	$36,026	–$7,743	$148,695	–$120,413

Source: Author's calculations using OSPC calculator.

The welfare effects of these reforms differ greatly depending on age. We display the welfare results of these reforms for those age 65 and older (Table 7) and those under the age of 65 (Table 8).

Those over the age of 65 experience dramatic welfare losses across all income bins. The largest net welfare losses are experienced by those in the lowest income bin ($34,167) and the highest income bin ($135,217). This is largely because of the repeal of Social Security and Medicare under the reforms, which the UBI does not fully replace.

Table 7. Reform Results for Tax Units with Individuals Age 65 or over, by WAS

WAS Floor	Tax Unit Stats		Average UBI		Average Adjusted Benefits Change	Average Tax Liability Change	Adjusted Combined UBI, Tax Reform, Benefits Repeal
	Total (Millions)	*Average Size*	*Per Person*	*Per Tax Unit*			
$0	29.33	1.73	$13,437	$22,947	–$40,690	$4,718	–$22,461
$10,000	3.42	1.95	$13,507	$26,128	–$31,159	$7,838	–$12,868
$20,000	2.73	1.99	$13,548	$26,742	–$31,478	$8,500	–$13,236
$30,000	0.93	2.00	$13,518	$26,748	–$29,992	$7,677	–$10,922
$40,000	0.54	2.00	$13,423	$26,428	–$32,703	$7,195	–$13,471
$50,000	0.87	2.03	$13,524	$27,146	–$29,027	$8,163	–$10,044
$75,000	0.44	2.00	$13,542	$26,859	–$28,637	$9,227	–$11,005
$100,000	0.52	2.09	$13,530	$28,047	–$31,687	$12,378	–$16,018
$200,000	0.17	2.00	$13,621	$27,022	–$27,590	$23,433	–$24,002
$1,001,000	0.01	1.90	$13,788	$26,022	–$22,464	$137,770	–$134,013

Source: Author's calculations using OSPC calculator.

When those over the age of 65 are excluded from the welfare analysis, only those making more than $1,001,000 experience a net welfare loss. All other income bins experience a net welfare gain from this reform. Most individuals in this table are ineligible for Social Security and Medicare and therefore do not experience a welfare loss from their repeal.

Table 8. Reform Results for Tax Units with Individuals Under 65, by WAS

WAS Floor	Tax Unit Stats		Average UBI		Average Adjusted Benefits Change	Average Tax Liability Change	Adjusted Combined UBI, Tax Reform, Benefits Repeal
	Total (Millions)	*Average Size*	*Per Person*	*Per Tax Unit*			
$0	47.19	2.05	$11,305	$22,195	–$10,316	$5,107	$6,773
$10,000	12.74	1.56	$12,284	$18,558	–$4,990	$6,413	$7,155
$20,000	11.01	1.68	$11,900	$19,535	–$4,572	$7,426	$7,537
$30,000	10.16	1.74	$12,498	$20,816	–$3,511	$8,214	$9,090
$40,000	8.01	1.79	$12,617	$21,616	–$3,718	$8,923	$8,975
$50,000	14.47	2.01	$12,633	$24,330	–$3,232	$10,755	$10,342
$75,000	8.58	2.46	$12,351	$29,077	–$2,468	$14,153	$12,456
$100,000	13.21	2.80	$12,132	$32,493	–$2,338	$18,090	$12,064
$200,000	4.15	3.14	$11,893	$35,642	–$2,158	$28,627	$4,856
$1,001,000	0.16	3.25	$11,892	$36,762	–$5,931	$149,515	–$118,685

Source: Author's calculations using OSPC calculator.

Modeling Notes and Caveats

This analysis relies on three open source models. We use Tax Calculator and Tax Data to estimate the consequences of the tax provisions, and we use the new CPS C-TAM to estimate the consequences of repealing welfare and transfer programs. Welfare is calculated using dollar welfare values for cash transfer programs and adjusted-welfare calculations for in-kind programs.

Modeling the Tax Programs and UBI. We model the tax programs and UBI by using Tax Calculator and Tax Data, which are two open source models that together form an open source microsimulation tax model for revenue and distributional analysis of federal tax policy, and by implementing a UBI.

Tax Calculator computes federal individual income taxes and Federal Insurance Contribution Act taxes for a sample of tax filing units in years beginning with 2013. Tax Data creates a micro dataset that closely reproduces the multivariate distribution of income, deduction, and credit items in 2009, extrapolated through 2026 levels in accordance with Congressional Budget Office forecasts available in spring 2016. It

is intended to match similar, but confidential, data the Congressional Joint Committee on Taxation uses.[5] Additional information on nonfilers is taken from the March 2014 CPS.

Modeling the Benefit Programs. We rely on the CPS Annual Social and Economic Supplement to model the repeal of benefits programs. The main challenge with using the CPS is that welfare and transfer programs are systematically underreported. For some programs such as Medicaid and Medicare, participation is reported, but benefits are excluded entirely. We employ the C-TAM model to adjust the CPS for the underreporting of welfare and transfer program participation and benefits and to impute benefits where they are excluded. Once the adjustments are made, repealing the programs is as simple as zeroing out the benefits. To make the results comparable to the tax analysis, we form tax units from the CPS.

Combining the Tax, Benefit, and UBI Analyses. As described above, we microsimulate the tax reform and UBI on one dataset and the benefits repeals on a separate dataset. We combine the effects by merging the distributional tables from the two separate datasets, tabbed by wages and salary as they are presented in the paper.

There are several important caveats to address. The first is that the open source models underlying this analysis are under constant development and improvement. Therefore, the results reported in this paper will change as improvements are made. Second, the analysis in this paper is done on a strictly static basis. It does not account for any behavioral changes associated with a loss in welfare benefits, tax increases, or a UBI. Third, the tabular merge between the tax dataset and the benefits dataset is an inexact way to combine the effects of the reforms. For example, differences in the age distribution by wage and salary bin mean that the under 65, over 65, and all tax units tables are not entirely consistent. Fourth, we apply welfare multiples only to in-kind programs (VB, Medicare, and Medicaid). We do not capture changes in deadweight loss because of the tax reform or changes to cash programs. Welfare calculations exclude any effects from reforming the tax code and any intragenerational welfare transfers resulting from the repeal of Social Security. Fifth, the C-TAM model that we rely on for benefits values does not include administrative costs, which are small but should be accounted for in this analysis. Further, C-TAM should be improved in several other areas, such as accounting explicitely for institutional program participants, who are excluded from the CPS. More detail on the C-TAM model is available in the extensive C-TAM documentation.[6] Sixth, the distributional tables in this report use a very narrow measure of income, wages, and salary.

Conclusion

We use an open source modeling suite to examine the consequences of replacing most welfare and transfer programs and base-narrowing features of the individual income tax system with a budget-neutral UBI. Together, these reforms free $3.21 trillion that can be used to provide a UBI of $13,788 for individuals 18 or older and $6,894 for individuals under 18. This results in increased tax liabilities across all wages and salary bins, in part because individuals now pay taxes on all income, including wages and the UBI. We find substantial differences in welfare effects across income and age groups, with those 65

[5] The underlying dataset must be purchased from the Internal Revenue Service's Statistics of Income division.
[6] Documentation for C-TAM v 0.1.1, used in this paper, is available at https://github.com/open-source-economics/Benefits/blob/9412c23d10f69dd099f41ee340af5f3f5923fa86/C-TAM%20Documentation%20v0.1.1.pdf.

and over experiencing net welfare losses from the reform. This is largely because of the repeal of Social Security and Medicare. Those under the age of 65 experience net welfare gains from the reform, except the top income bin.

These results should be interpreted cautiously, and future analysis should incorporate dynamic effects of the reform and strive to unify the analysis of the tax, UBI, and benefits programs on the same dataset.

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Appendix A. Welfare and Transfer Programs

Table 9. Welfare and Transfer Programs

Program	Cost (Millions)	Program	Cost (Millions)
Social Security*	$884,641	Health Resources and Services	$7,604
Medicare*	$593,105	Payments to States—Foster Care/Adoption Assist	$6,868
Medicaid*	$413,632	Supplemental Feeding Programs (Women, Infants, and Children and Commodity Supplemental Food Program)	$6,266
VB*	$157,511	Veterans Non-Service-Connected Pensions	$5,251
SNAP*	$68,389	Payments to States for Day Care Assistance	$5,064
Student Assistance—Department of Education and Other	$56,337	Indian Health	$4,510
SSI*	$55,393	Refugee Assistance and Other Payments	$4,403
Housing Assistance	$46,600	352 Agricultural Research and Services	$4,374
Unemployment Assistance	$43,504	Low-Income Home Energy Assistance	$3,537
Payment Where Child Credit Exceeds Tax Liability	$21,490	Substance Abuse and Mental Health Services	$3,193
Family Support Payments to States and Temporary Assistance for Needy Families	$20,378	452 Area and Regional Development	$3,027
351 Farm Income Stabilization	$20,012	Aging Services Programs	$1,462
Child Nutrition and Special Milk Programs	$19,490	Other Public Assistance	$1,071
506 Social Services	$17,299	Energy Employees Compensation Fund	$1,052
Refundable Premium Tax Credit and Cost Sharing Reductions	$13,068	Center for Medicare and Medicaid Innovation	$997
Other Medical Care	$12,834	Commodity Donations and Other	$823
453 Disaster Relief and Insurance	$9,747	Coal Miners and Black Lung Benefits	$426
Children’s Health Insurance	$9,317	September 11 Victim Compensation	$49
Railroad Retirement (Excluding Social Security)	$8,803	**Total: Non-Modeled**	**$366,752**
451 Community Development	$7,896	**Total: C-Tam**	**$2,172,671**
		Total	**$2,539,423**
* Modeled by C-TAM			

Source: Literature and author’s calculations.

Appendix B. Welfare Multiples

Welfare multiples are drawn from the literature when possible. The range of estimates and sources are shown in Table 10.

Table 10. Welfare Multiples in Literature

Program	Work	Welfare Multiple	Notes
SNAP	Timothy M. Smeeding et al., "Poverty, Inequality, and Family Living Standards Impacts Across Seven Nations: The Effect of Noncash Subsidies for Health, Education and Housing," *Review of Income and Wealth* 39, no. 3 (September 1993), http://www.roiw.org/1993/229.pdf.	0.97	
SNAP	Robert Moffitt, "Estimating the Value of an In-Kind Transfer: The Case of Food Stamps," *Econometrica* 57, no. 2 (March 1989), https://ideas.repec.org/a/ecm/emetrp/v57y1989i2p385-409.html.	1.00	
SNAP	Diane Whitmore, "What Are Food Stamps Worth?" (working paper, Princeton University, July 2002), 468, https://core.ac.uk/download/pdf/6985057.pdf.	0.80	
Medicare	Josh Lustig, "Measuring Welfare Losses from Adverse Selection and Imperfect Competition in Privatized Medicare," Boston University, July 2009, http://www.heinz.cmu.edu/appliedmicro/lustig.pdf.	0.78	For Medicare Part C
Medicare	Anne Hall, "The Value of Medicare Managed Care Plans and Their Prescription Drug Benefits," Federal Reserve Board, March 2007, https://www.federalreserve.gov/pubs/feds/2007/200719/200719pap.pdf.	0.72	For Medicare Health Maintenance Organizations
Medicare	Amy Finkelstein and Robin McKnight, "What Did Medicare Do (And Was It Worth It)?" (working paper 11609, National Bureau of Economic Research, September 2005), http://www.nber.org/papers/w11609.	0.45, 0.75	Range, Depends on Specification
Medicaid	Amy Finkelstein, Nathaniel Hendren, and Erzo F. P. Luttmer, "The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment" (working paper, National Bureau of Economic Research, June 2015), http://users.nber.org/~luttmer/valueofmedicaid.pdf.	0.20, 0.40	Range, Depends on Specification
Medicaid	Trevor S. Gallen, "Using Participant Behavior to Measure the Value of Social Programs: The Case of Medicaid," Purdue University, Winter 2015, https://www.ntanet.org/wp-content/uploads/proceedings/2015/208-gallen-using-participant-behavior-measure-value.pdf.	0.24, 0.35	Range, Depends on Specification

Source: Literature and author's calculations.

Appendix C. Approximating VB Welfare Multiples

The literature does not provide welfare multiples for VB. To remedy this, we approximate the welfare multiple by aggregating welfare multiples for similar services from other government programs. The Veterans Benefits Association Annual Benefits Reports provides a convenient basis for accomplishing this, dividing the benefits programs into six sections: compensation, pension and fiduciary, education, vocational rehabilitation and employment, insurance, and home loan guaranty. Compensation includes service-connected disability or death benefits. Pension and fiduciary includes veterans' non-service-connected pension and survivors' pension. Education includes all education benefit programs for veterans. Insurance includes the veteran's 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 cannot gain secure employment because of their service-connected disabilities. The amount spent on these programs in fiscal year 2014 is shown in the following table, along with the share of spending and the assumed welfare multiple.[7]

Table 11. VB Expenditures (2014)

Program	Dollars (Millions)	Percentage of Total	Welfare Multiple
Compensation	$64,456	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: Literature and author's calculations.

The vast majority of expenditures (75.55 percent) are on compensation—essentially transfer payments. These payments are exempt from tax and can be paid to the veteran or his or her surviving beneficiary.[8] These benefits are paid out according to a schedule of injury and disability. 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, accounting for 14.24 percent of total VB expenditures. Joshua Angrist (1993) finds that using VB (specifically education benefits)

[7] Veterans Benefits Administration, "Annual Benefits Report: Fiscal Year 2014," 2014, http://www.benefits.va.gov/REPORTS/abr/ABR-IntroAppendix-FY14-11032015.pdf.
[8] Veterans Benefits Administration, "Annual Benefits Report: Compensation," 2014 http://www.benefits.va.gov/REPORTS/abr/ABR-Compensation-FY14-10202015.pdf.

raises annual earnings by 6 percent, with 77 percent of those attending college or graduate school with VB receiving this premium.[9] Using a discount factor of 10 percent annually, Angrist finds the premium over a recipient's working life is $17,717 in 1986 dollars. The author concludes that VB do not appear to be socially wasteful.[10] This suggests a welfare multiple close or equal to one.

Pension and fiduciary benefits are responsible for 6.33 percent 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 VB.

The remaining sections account for 0.88 percent of total VB, having little to no impact on the whole-program welfare multiple. If these programs are assumed to have a welfare multiple of zero, the whole-program multiple 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 whole-program welfare multiple increases to 0.97. A conservative estimate should estimate the whole-program welfare multiple between 0.95 and 0.97. We assume 0.95.

[9] Joshua D. Angrist, "The Effect of Veterans Benefits on Education and Earnings," *ILR Review* 46, no. 4 (July 1993), http://www.jstor.org/stable/2524309.
[10] Ibid.