

The following appendices are supplemental to a Commonwealth Fund issue brief, J. Liu and C. Eibner, *Extending Marketplace Tax Credits Would Make Coverage More Affordable for Middle-Income Adults* (The Commonwealth Fund, July 2017), available on the Fund's website at: <http://www.commonwealthfund.org/publications/issue-briefs/2017/jul/marketplace-tax-credit-extension>.

APPENDIX A. TAX-CREDIT EXTENSION ANALYSIS

COMPARE Overview

COMPARE is a microsimulation model that uses economic theory, nationally representative data, and evidence from experience to estimate how consumers and business will respond to health policy changes.¹ The model creates a synthetic population of individuals, families, health expenditures, and firms using data from the 2008 Survey of Income and Program Participation (SIPP), the Medical Expenditure Panel Survey (MEPS), and the Kaiser Family Foundation Annual Survey of Employer Benefits.

We assign each individual in the SIPP a spending amount using the spending of a similar individual from the MEPS. We then augment spending imputations with data on high-cost claims from the Society of Actuaries. These adjustments account for the fact that the MEPS underrepresents individuals with high spending.

Individuals in COMPARE make health insurance enrollment decisions by weighing the costs and benefits of available options, an approach that is referred to by economists as “utility maximization.” The utility-maximization framework accounts for the following:

- premium costs
- anticipated out-of-pocket health care spending
- the value of health care consumption
- the risk of incurring a financially devastating health care bill, and
- any penalties the individual would face by remaining uninsured, including the risk of facing denial or being charged higher premiums at a later date.

Premium costs are adjusted to account for tax credits, if such credits are available to the enrollee. All else being equal, higher premiums reduce an individual's probability of enrolling in health insurance. In contrast, several factors encourage enrollment, such as a lower risk of catastrophic spending, reduced out-of-pocket spending, the avoidance of penalties, and increases in health care utilization.

Businesses in the model make decisions by considering the value of health insurance to their workers. Tax credits for individual market coverage and Medicaid eligibility expansions may reduce the value of health insurance to workers, leading firms to drop insurance. However, mandates requiring individuals to enroll in insurance, as well as mandates requiring firms to offer coverage, tend to increase the likelihood that a firm will offer insurance.

We calibrate the model to ensure that it accurately predicts outcomes for years in which complete data exist.

The Approach to Modeling the ACA

To model individual and family health insurance enrollment decisions under the ACA, COMPARE uses a utility-maximization approach, in which decision-makers weigh the costs and benefits of available options. The utility-maximization framework accounts for the tax penalty for not purchasing insurance, the value of health care consumption, premium costs, expected out-of-pocket health care spending, and financial risk associated with out-of-pocket spending.

We scale each of these components of utility to dollars and assume that they are additively separable.² We further assume that individuals' utilities are separable in consumption and health. The health-related component of the utility function is modeled as follows:

$$U_{ijk} = u(H_{ij}) - E(OOP_{ij}) - p_{ij}^{(H)} - \frac{1}{2}rVAR(OOP_{ij}) - (0.8 * Penalty_j) + Calibration_{jk}$$

Within this equation:

- $u(H_{ij})$ is the utility associated with consuming health care services for individual i under insurance option j
- k represents an individual's demographic group based on age, health status, and income
- OOP_{ij} is the out-of-pocket spending expected
- $p^{(H)}$ is the individual's premium contribution (after adjusting for tax credits), and
- r is the coefficient of risk aversion.

Possible health insurance enrollment choices (j) under the ACA may include employer coverage, Medicaid or Children's Health Insurance Program (CHIP) coverage, an ACA-compliant individual-market plan (including plans available on and off the marketplaces), or another source of coverage.³ Individuals can also choose to forgo insurance. Not all individuals will have access to all forms of coverage. For example, access to Medicaid is contingent on eligibility, and individuals will have access to employer coverage only if they (or their spouse or parent) work for a business that offers insurance.

The *Penalty* term represents the tax penalty associated with insurance status j , and it is 0 for all but the uninsured insurance status. We downweight the tax penalty by a factor of 0.8 to capture the fact that, on average, the Internal Revenue Service collects only about 80 percent of taxes owed.⁴

The term *Calibration* _{jk} is a factor that adjusts utilities to match enrollment patterns observed in pre-ACA data. The term accounts for nonpecuniary factors that may influence preferences for different types of insurance. Such factors include the convenience associated with enrolling in employer coverage and access constraints associated with Medicaid. Specific modeling strategies for each source of coverage j are described next.

Small-Group Employer Coverage. Small employers in the model choose whether to offer coverage based on worker preferences and a small set of other factors, including the employer's industry and whether workers are unionized. Under the ACA, all small firms are part of a single risk pool with guaranteed issue, three-to-one rate banding on age, and restrictions that preclude insurers from charging different premiums to different groups other than based on geography, family size, tobacco use, and plan generosity.

In the current version of the model, small-group market regulations apply to all firms with 50 or fewer employees, regardless of year. Earlier versions of the model expanded the small-group market to include firms with 100 or fewer workers after 2015, as originally intended by the ACA. We revised the definition because the Protecting Affordable Coverage for Employees Act, signed into law in late 2015, amended the ACA's definition of a *small employer* to include firms with one to 50 employees in perpetuity, unless states opt to extend the small-group market to firms with up to 100 workers.

Small firms in the model are permitted to purchase a 60 percent, 70 percent, 80 percent, or 90 percent actuarial value plan on the ACA's regulated small-group market, which includes the Small Business Health Options Program (SHOP) marketplaces. Small firms in the model may retain grandfathered status, which exempts them from the ACA's rating regulations, although we assume that a certain percentage of small firms will lose grandfathered status each year.

The ACA also offers a small-business tax credit to small firms with low-wage workers who obtain coverage through the SHOP marketplaces. Because firms can take advantage of these credits for only two years, we assume that all small firms will have exhausted their tax-credit eligibility by 2020 (the year modeled in this analysis).

Large-Group Employer Coverage. Like small employers, large employers choose whether to offer coverage based on worker preferences and several other characteristics, including union status and industry. We allow large firms that offer coverage to choose between four different plans, which are distinguished by plan generosity and rated based on enrollees' expected health expenditures. We estimate premiums for the large-group market based on a regression. The firm's decision to offer is modeled using structural econometric techniques.

Medicaid. We model state Medicaid expansion decisions as of January 1, 2017,⁵ and include North Carolina as a Medicaid expansion state.⁶ We assume that, under the ACA, states with Medicaid eligibility thresholds that exceeded 138 percent of the federal poverty level (FPL) before 2014 will roll back their eligibility thresholds to 138 percent because of federally funded tax credits and cost-sharing subsidies that become available to this group. In states that did not expand Medicaid, individuals who would have qualified for Medicaid expansion and have income above FPL can obtain tax credits on the market-

places. However, those with incomes below FPL are ineligible for tax credits. Through our calibration process, the model accounts for the fact that not all Medicaid-eligible individuals chose to enroll, perhaps because of stigma, lack of information, or transaction costs associated with enrolling. To account for the fact that the ACA increased Medicaid enrollment among the previously eligible population, we increase the calibration parameter by a factor of approximately \$200 in the post-2014 period.

Individual Market. Under the ACA, the individual market consists of two components: 1) the insurance marketplaces where individuals can receive tax credits, and 2) off-marketplace plans that comply with the ACA's rating requirements. Because the ACA requires all plans in the individual market to be rated together, we model on- and off-marketplace plans that are ACA-compliant as a single risk pool. Hence, we do not distinguish between enrollment in on-marketplace plans and off-marketplace plans that comply with the ACA. In the ACA-compliant individual market, modeled individuals and families can purchase plans with a 60 percent, 70 percent, 80 percent, or 90 percent actuarial value, corresponding to bronze, silver, gold, and platinum plans on the marketplaces, respectively. We do not model catastrophic plans, which are available only to those under age 30 or who qualify for a hardship exemption from the individual mandate. According to a 2015 fact sheet published by the Centers for Medicare and Medicaid Services (CMS), less than 1 percent of all marketplace enrollees have selected catastrophic coverage.⁷

ACA-compliant individual market premiums are calculated endogenously in the model based on the health expenditure profile of those who choose to enroll. The total, unsubsidized premium is based on enrollees' age, smoking status, and market-rating reforms implemented under the ACA.⁸ We model three-to-one rate-banding on age for adults ages 21 and older, with a separate age band for children and young adults under age 21. We also account for the ACA's risk-adjustment requirements, which transfer funds from plans with lower-than-average actuarial risk to plans with higher-than-average actuarial risk.

The U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (ASPE) reports the average second-lowest-cost silver premium for a 27-year-old to be \$296 per month in 2017.⁹ This compares to our estimate of \$348 per month for 2020, which reflects an average of 5.5 percent growth per year from the status quo. We do not account for possible

changes to the individual market that may occur given uncertainties, such as possible funding cuts to cost-sharing reductions and not enforcing the individual mandate.

Under the ACA, the actual premium an enrollee pays is adjusted to account for tax credits available to qualifying individuals with incomes between 100 percent and 400 percent of FPL who do not have affordable offers of insurance from another source (e.g., employer coverage, Medicaid). We apply the ACA's subsidy formula using the benchmark silver premium and the individual's income. Eligible individuals who have incomes between 100 percent and 250 percent of FPL can also receive cost-sharing subsidies that help to lower out-of-pocket spending. As required by the ACA, individuals receiving cost-sharing subsidies in COMPARE must purchase a silver plan (70 percent actuarial value), and out-of-pocket spending is reduced to an equivalent of 94 percent, 87 percent, or 73 percent actuarial value plan if the individual's income is between 100 percent and 150 percent, 150 percent and 200 percent, or 200 percent and 250 percent of FPL, respectively. Note that out-of-pocket spending enters the individual's utility function; hence, individuals receiving cost-sharing subsidies are more likely to purchase coverage.

Comparison to Congressional Budget Office (CBO) Estimates. We also compared the current COMPARE insurance estimates for 2020 under current law with those of the CBO (Exhibit A1). We consider both CBO's March 2016 baseline,¹⁰ which they used in their estimates of the potential effects of the American Health Care Act, and a subsequent update from January 2017.¹¹ The January update revised downward CBO's estimate of the number of enrollees in the individual market. Although the January update reported only individual market coverage and the number of uninsured individuals, the text stated that the reduction in estimated individual market enrollment was largely offset by revising upward the number of enrollees in employer-sponsored coverage.

After accounting for these changes, RAND's estimates are very similar to CBO's. One remaining difference is that CBO allows people to have more than one source of health insurance coverage, so the numbers in its 2016 baseline do not sum to population totals. RAND assigns everyone a primary insurance category, and does not account for multiple sources of coverage. This accounting difference may explain why CBO estimates more Medicaid enrollees than RAND.

Expanding the Tax Credits to Those with Incomes Above 400 Percent of FPL

To model the expansion of tax credits to individuals with incomes above 400 percent of FPL, we simply extend the tax credits to this population in our model. The change influences the chance of enrolling in the individual market by reducing the premium contribution that the enrollee faces (in the equation shown in the prior section). In addition, the tax credit reduces premium spending for eligible individuals who would have enrolled in the individual market without the tax credits, and increases government spending.

As under current law, we continue to assume that those with affordable employer coverage are ineligible for tax credits. Affordability is defined as having an employer premium contribution for single coverage that exceeds 9.95 percent of income. Further, we assume that those with incomes below 100 percent of FPL remain ineligible for tax credits, even if their states opted not to expand Medicaid.¹²

The proposed modification to extend the tax credit produces a number of changes in insurance coverage compared to the ACA (Exhibit A2). With the tax-credit extension above 400 percent of FPL, there is a 1.4 million increase in individual market coverage. This increase is offset by a small decrease of 300,000 enrollees in employer-sponsored insurance. In the tax-credit extension scenario, there are 2.8 million uninsured individuals with incomes above 400 percent of FPL. Many of these individuals are firewalled from receiving tax credits because they have an affordable offer from another source such as their employer.

Because the tax credit brings some new individuals into the individual insurance market, it has a small effect on the insurance risk pool. We estimate that it will decrease premiums by 2.6 percent because newly tax-credit-eligible enrollees tend to be healthier and less expensive given their age than other enrollees.

Exhibit A1. Insurance Enrollment by Source of Coverage Under the ACA, CBO and COMPARE, 2020

	CBO March 2016 (millions)	CBO January 2017 (millions)	COMPARE June 2017 (millions)
Total insured	249	—	252.8
Employer	152	—	155.7
Medicaid	68	—	62.0
Individual market	27	21	22.7
Other	14	—	12.5
Uninsured	27	28	25.2
Total population	276	—	278
Share uninsured	9.8%	—	9.1%

Note: Estimates reflect current law (the ACA), assuming the individual mandate is enforced and cost-sharing reductions are funded. CBO's numbers do not sum to population totals because they allow individuals to be assigned to more than one source of insurance coverage. CBO's January 2017 update reported estimates only for individual market coverage and the number uninsured.

Source: CBO estimates from 2016 and 2017.

Exhibit A2. Insurance Coverage, 2020

	ACA (millions under age 65)	Proposed tax credit extension (millions under age 65)	Difference (millions under age 65)
Total insured	252.8	254.0	1.2
Employer	155.7	155.5	-0.3
Medicaid	62.0	62.0	<0.1
Individual market	22.7	24.1	1.4
Other	12.5	12.5	0
Uninsured	25.2	24.0	-1.2
Up to 400% of FPL	21.5	21.3	-0.2
More than 400% of FPL	3.7	2.8	-0.9

APPENDIX B. CASE STUDIES

The ACA provides eligible individuals with a tax credit equal to the cost of the second-lowest-cost silver plan available to the enrollee minus a means-tested percentage contribution. The approach provides a “safety valve” that protects individuals from spending more than a specified percentage of income on premiums if they chose the second-lowest-cost silver plan or a less expensive plan. Under current law, the safety valve is only available for individuals with incomes between 100 percent and 400 percent of FPL. We estimate that, in 2020, the safety valve would prevent people with incomes between 300 percent and 400 percent of FPL from spending more than 9.95 percent of income on premiums, if they enrolled in the second-lowest-cost silver plan. The proposed change would extend the safety valve to individuals with incomes above 400 percent of FPL.

We provide example cases of individuals at different age and income levels (Exhibit A3). The tax credit is only paid if premiums exceed the required income contribution.

Thus, younger people at higher income levels are unlikely to receive a tax credit. (In fact, even under current law, many young people between 300% and 400% of FPL are not receiving tax credits.)

Extending tax credits has the biggest impact for older people who are just above the 400 percent of FPL threshold. The tax credit eliminates the steep cliff that exists for some age and income groups under current law. For example, we show the estimated second-lowest-cost silver premium for 2020 for a nationally representative population of individual market enrollees (Exhibit A3). Under current law, a 64-year-old whose income rises from \$48,000 to \$50,000 loses \$6,424 in tax credits. That implies a marginal tax rate of more than 100 percent and means that the individual would be better off without the income increase. With the proposed change, this individual’s tax credit declines by only about \$200 as income rises from \$48,000 to \$50,000.

Exhibit A3. Example Cases of How the Proposed Change Would Work, 2020

Age	Income	Federal poverty level (%)	Second-lowest-cost silver premium	Current law tax credit	Proposed tax credit
25	\$48,000	398%	\$4,200	\$0	\$0
	\$50,000	415%	\$4,200	\$0	\$0
	\$75,000	622%	\$4,200	\$0	\$0
40	\$48,000	398%	\$5,200	\$424	\$424
	\$50,000	415%	\$5,200	\$0	\$225
	\$75,000	622%	\$5,200	\$0	\$0
50	\$48,000	398%	\$7,600	\$2,824	\$2,824
	\$50,000	415%	\$7,600	\$0	\$2,625
	\$75,000	622%	\$7,600	\$0	\$138
64	\$48,000	398%	\$11,200	\$6,424	\$6,424
	\$50,000	415%	\$11,200	\$0	\$6,225
	\$75,000	622%	\$11,200	\$0	\$3,738

Note: The tax credit is equal to the second-lowest-cost silver premium minus 9.95 percent of income. Under current law, only those with incomes between 100 percent and 400 percent of the federal poverty level are eligible for tax credits. The proposed change would eliminate the upper limit on tax-credit eligibility.

APPENDIX C. COMPARISON TO OTHER PROPOSALS THAT MODIFY THE PREMIUM TAX CREDITS

Extending the ACA's premium tax credits to individuals with incomes above 400 percent of FPL is one possible modification to the tax credits. Exhibit A4 shows alternative modifications to the tax credits that RAND has previously analyzed compared to the current analysis. Each of

these modifications would increase the number of insured but would require additional federal spending. Exhibit A4 focuses on coverage and spending but does not consider other metrics, such as how the policies might affect labor force participation.

Exhibit A4. Comparison to Prior RAND Analyses of Select Policy Options Modifying Premium Tax Credits

	Year	Number of insured (millions)	Federal deficit (billions)
Fix family glitch: allow an exception to the firewall for anyone in a family where the family employer-sponsored insurance premium contribution exceeds the required percent contribution of the worker's household income ^a	2017	+1.5	+\$8.9
Reduce maximum premium contribution for benchmark plan in marketplace: 8.5 percent for individuals between 300 percent and 400 percent of the federal poverty level and proportional reductions for lower income levels ^b	2018	+1.7	+\$3.5
Enhance tax credits for young adults: add \$50 per month for eligible adults ages 19 to 30, and smaller amounts for individuals ages 31 to 34 ^c	2018	+0.9	+\$4.0
Extend tax credits to individuals with incomes above 400 percent of the federal poverty level	2020	+1.2	+\$6.0

Note: The years analyzed vary in these analyses, and the model has been updated (e.g., to reflect more recent data) since some of the earlier results were published.

^a S. Nowak, E. Saltzman, and A. Cordova, *Alternatives to the ACA's Affordability Firewall* (RAND Corporation, 2015).

^b C. Eibner, S. Nowak, and J. Liu, *Hillary Clinton's Health Care Reform Proposals: Anticipated Effects on Insurance Coverage, Out-of-Pocket Costs, and the Federal Deficit* (The Commonwealth Fund, Sept. 2016).

^c E. Saltzman, and C. Eibner, "Insuring Younger Adults Through the ACA's Marketplaces: Options to Expand Enrollment," *To the Point*, The Commonwealth Fund, Dec. 16, 2016.

APPENDIX NOTES

- ¹ A. Cordova, F. Girosi, S. Nowak et al., “[The COMPARE Microsimulation Model and the U.S. Affordable Care Act](#),” *International Journal of Microsimulation*, 2013 6(3):78–117.
- ² This approach follows D. P. Goldman, J. L. Buchanan, and E. B. Keeler, “[Simulating the Impact of Medical Savings Accounts on Small Business](#),” *Health Services Research*, April 2000 35(1 Pt. 1):53–75.
- ³ Other sources of coverage include Medicare for the nonelderly with qualifying conditions and military-related sources of coverage, such as TRICARE.
- ⁴ Internal Revenue Service, [Tax Gap Estimates for Tax Years 2008–2010](#) (IRS, April 2016).
- ⁵ Kaiser Family Foundation, [Status of State Action on the Medicaid Expansion Decision](#) (Henry J. Kaiser Family Foundation, Jan. 1, 2017).
- ⁶ North Carolina’s governor announced plans to expand Medicaid, and — although there is uncertainty about whether the plans will move forward — we are assuming the state would expand by 2020. For a recent summary, see R. Craver, “[U.S. House ACA Reform May Turn Up Heat on N.C. Medicaid Expansion](#),” *Winston-Salem Journal*, March 8, 2017.
- ⁷ Centers for Medicare and Medicaid Services, [Fact Sheet: March 31, 2015 Effectuated Enrollment Snapshot](#) (CMS, June 2, 2015).
- ⁸ [Patient Protection and Affordable Care Act; Health Insurance Market Rules; Rate Review](#), 78 Federal Register 13405, Feb. 27, 2013.
- ⁹ [Health Plan Choice and Premiums in the 2017 Health Insurance Marketplace](#) (Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services, Oct. 24, 2016).
- ¹⁰ Congressional Budget Office, [Federal Subsidies for Health Insurance Coverage for People Under Age 65: 2016 to 2026](#) (CBO, March 24, 2016).
- ¹¹ Congressional Budget Office, [Federal Subsidies Under the Affordable Care Act for Health Insurance Coverage Related to the Expansion of Medicaid and Nongroup Health Insurance: Tables from CBO’s January 2017 Baseline](#) (CBO, 2017).
- ¹² Arguably, it would make more sense to extend tax credits to lower-income individuals, rather than providing additional federal assistance to people with incomes above 400 percent of FPL. However, because extending tax credits to lower-income populations might cause some states to rescind Medicaid expansion, extending tax credits to lower-income individuals may be a less viable policy option than extending them to those with incomes above 400 percent of FPL.