Health Insurance Reform and the (Re-)Distribution of Welfare: A Dynamic Structural Analysis of Heterogeneity in Willingness to Pay for the Affordable Care Act

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Background: ACA and Welfare

- Patient Protection and Affordable Care Act of 2010 (ACA) reformed non-group medical insurance market

Pre-ACA market

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- Who does this help? Who does this hurt? By how much?

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- How are those welfare effects attained?

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4. Consider insured rate, premium structure, willingness-to-pay

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- Welfare effects dominated by insurance subsidies (APTC)
- Subsidies drive IMI uptake for low- and mid-income workers
- Mandate induces IMI uptake for young and/or high income

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- Equilibrium insurance pricing: nested solution method Nested loop

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5. Chooses levels of consumption and medical care, pays for them Control variables
6. Transitions to the next period, with possible mortality Health process

Agent's Solution

- Fix calibrated and structural parameters and premiums
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- Discrete choice & deductible $\longrightarrow$ non-concave value function
- First order conditions necessary, but not sufficient

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- Medical tax rate τ also determined in equilibrium Medical tax rate

DATA & ESTIMATION

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- Use 2007-2013 waves of MEPS
- 55,525 working age observations; 9,844 retired obs

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- Compute weighted distance between model and data
- Weighting matrix: (inverse of) bootstrap covariance matrix

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- IMI insured rate by age (5 year blocks) & income quintile

Some Estimated Parameters

312 moments, 29 parameters, objective function value 779.47

	Est	Std Err	Description
β	0.944	(0.005)	Intertemporal discount factor
ρ	4.054	(0.067)	Coefficient of relative risk aversion for consumption
ν	23.80	(1.41)	Coefficient of relative risk aversion for medical care
$\underline{c}$	3828	(93)	Consumption floor (USD)
s_p	2264	(67)	Employer contribution to ESI (USD)

Mean medical need shock params   Stdev medical need shock params

Wealth Accumulation by Age

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ESI Uptake Rate by Age

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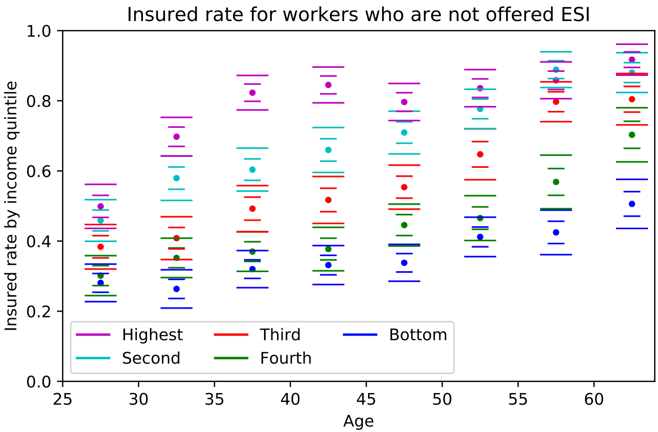
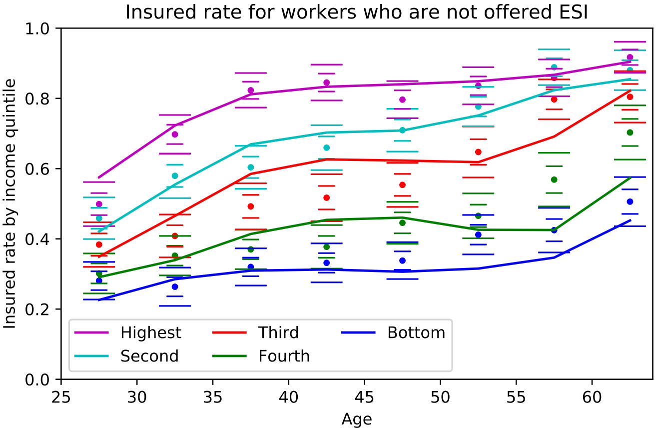
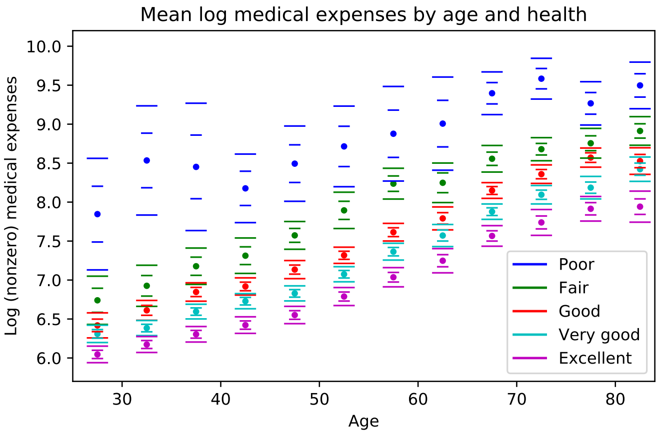
IMI Uptake Rate by Age & Income



IMI Uptake Rate by Age & Income



Medical Expenses by Age & Health



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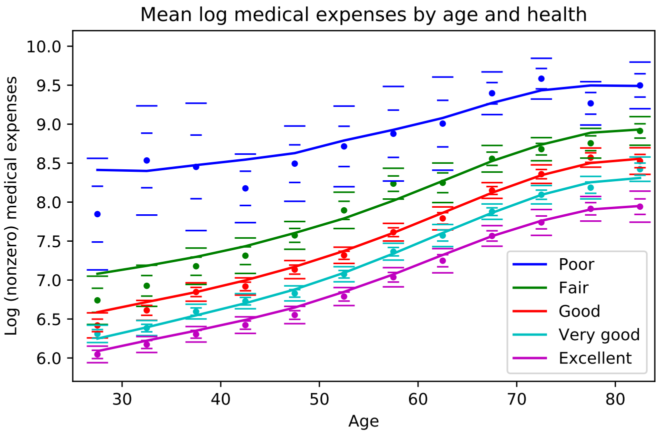

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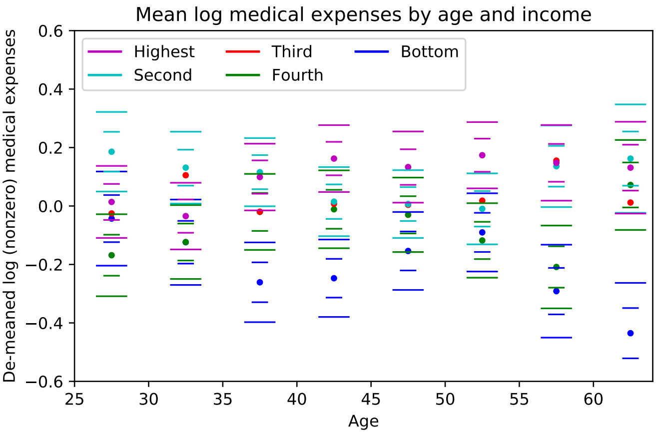

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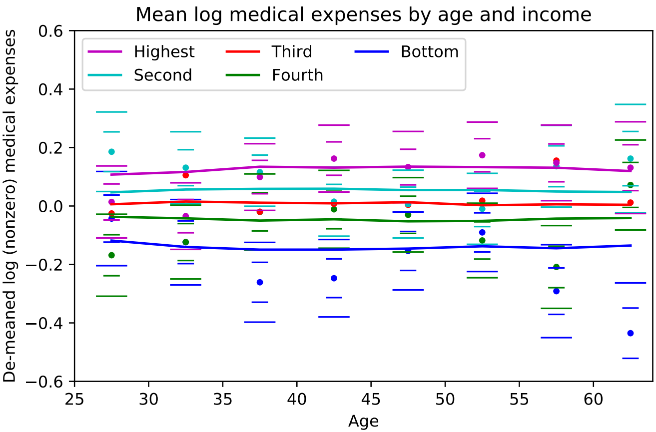
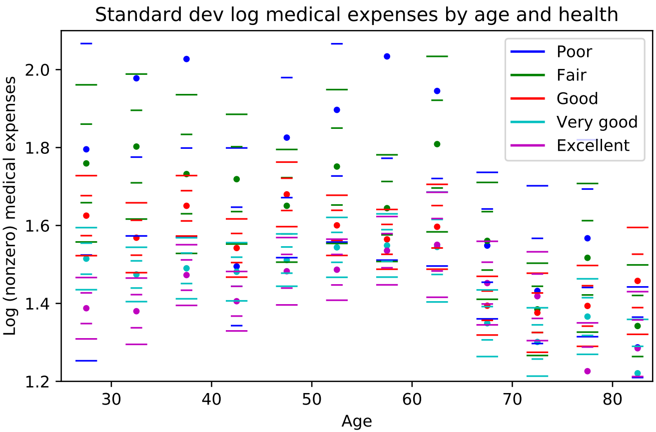


Standard Deviation of Medical Expenses by Age & Health



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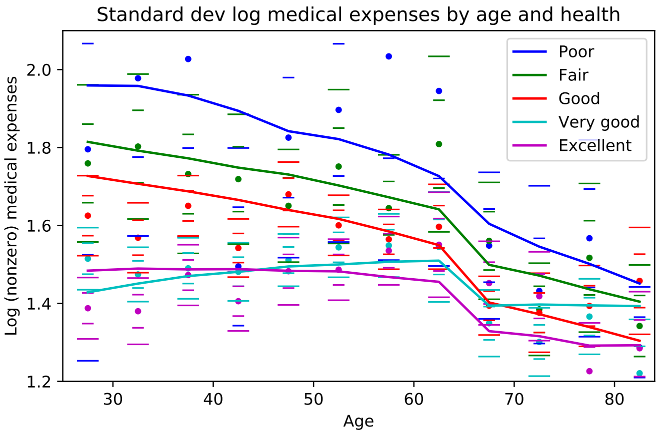
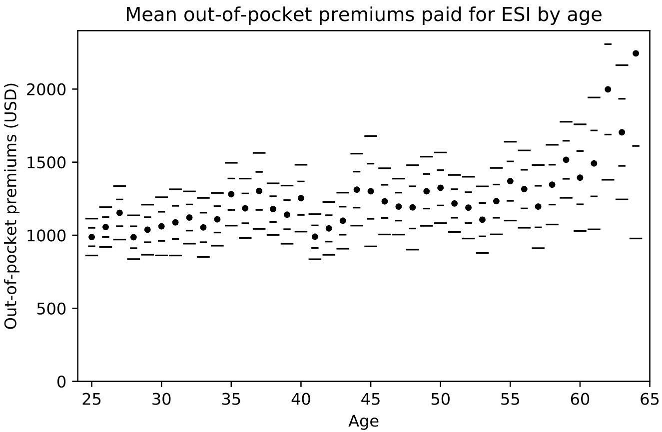


Out-of-Pocket ESI Premiums Age



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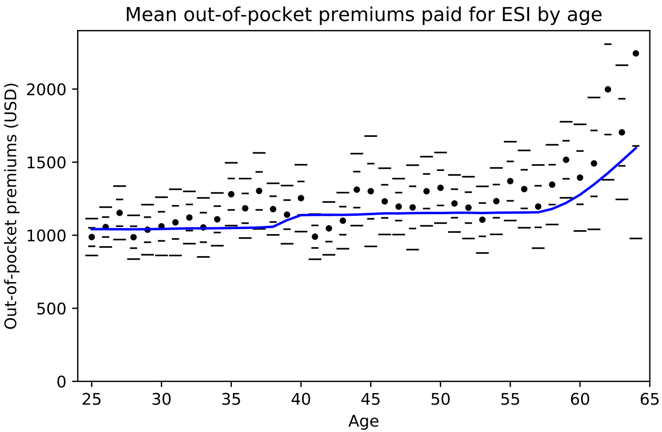

POLICY EXPERIMENTS

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  - How does saving behavior change?
  - How much more medical care is purchased?

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4. Calculate WTP as present value of change in lifetime income
5. Compute mean WTP by age, income, health, and ESI status

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- WTP decreases over lifecycle as remaining periods to benefit dwindle **and** uncertainty is resolved

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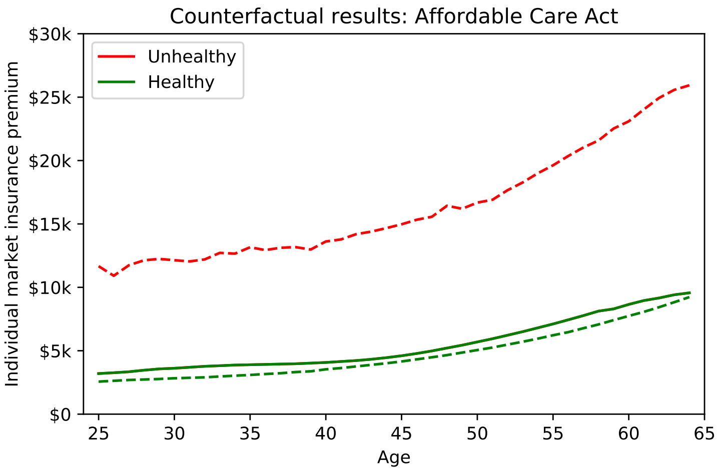
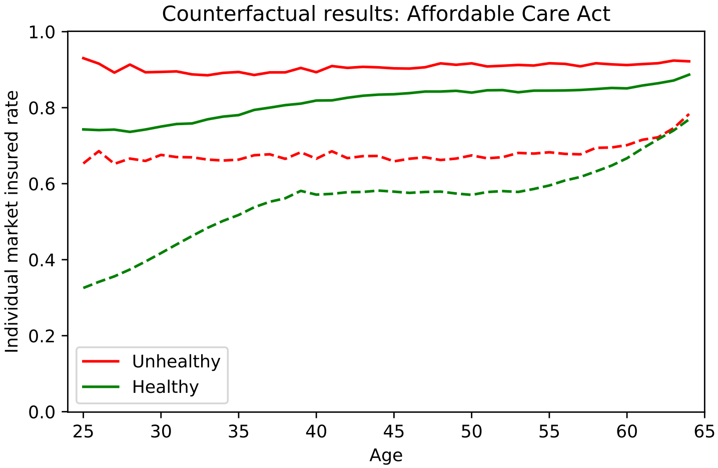
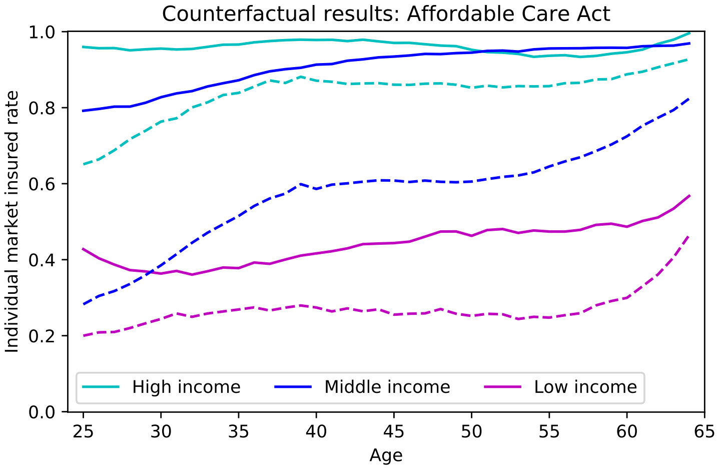


IMI Insured Rate by Health Status Under the ACA



IMI Insured Rate by Income Under the ACA



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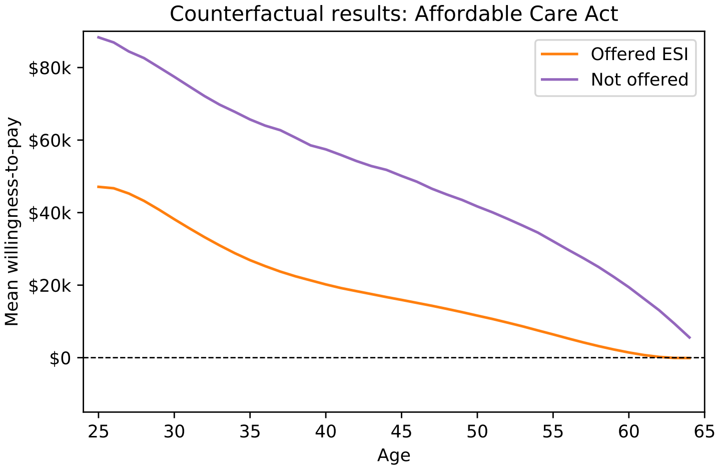

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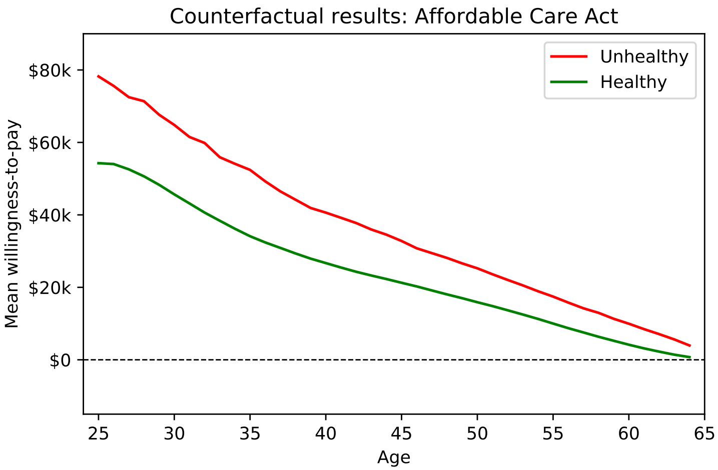
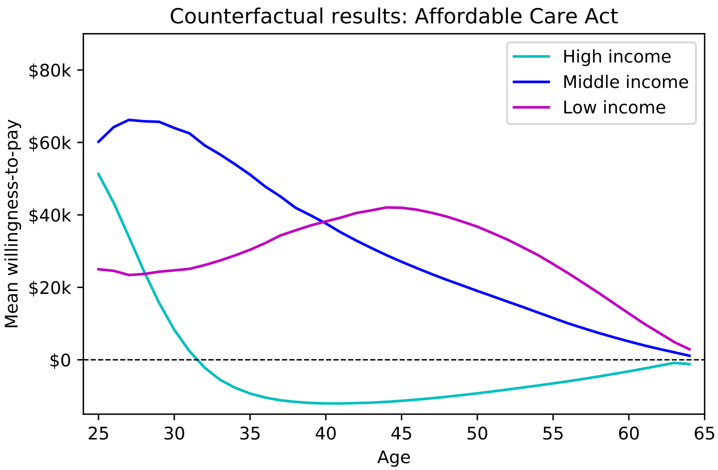
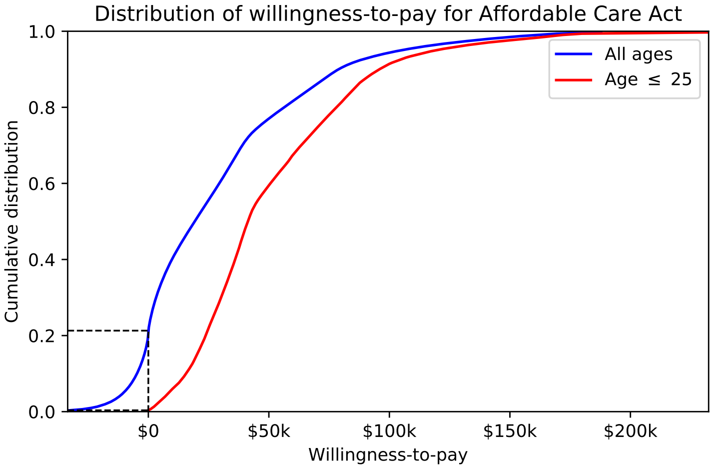


Mean WTP for the ACA by Income



Distribution of WTP for the ACA



Characterizing the Sign of the ACA's Welfare Effect

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- Convert $\widehat{Y}_{ejho}$ to conditional percentile of permanent income

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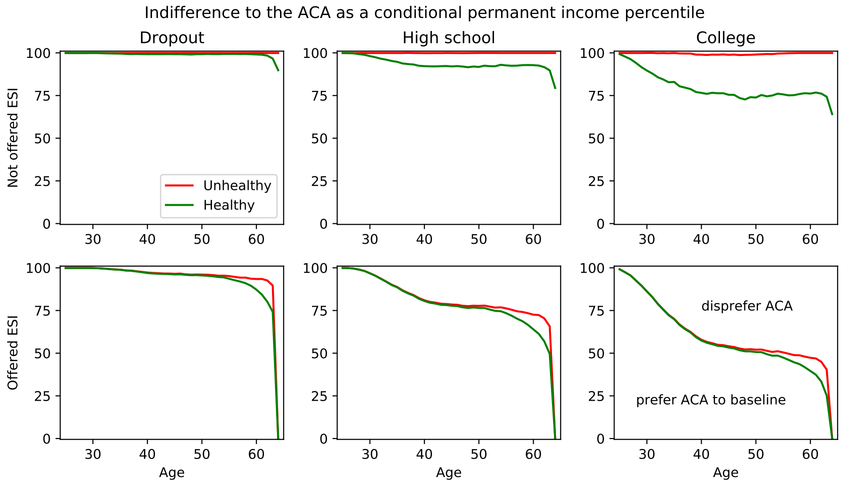

Decomposing the ACA's Effects

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Too many figures

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- Community rating very valuable for the unhealthy

Too many figures

Decomposing ACA Policy by Age Group

Group	Premium subsidies	Individual mandate	Community rating	Limited age rating	Whole ACA
All 22-64	\$28,544 (+5.6%)	−\$1,434 (+4.5%)	\$2,088 (−2.6%)	\$121 (−0.4%)	\$29,434 (+5.6%)
Ages 22-25	\$53,917 (+8.4%)	−\$6,715 (+9.6%)	\$4,911 (−2.8%)	\$785 (−1.3%)	\$51,647 (+7.6%)
Ages 25-34	\$47,004 (+7.6%)	−\$2,284 (+7.7%)	\$3,272 (−2.7%)	\$498 (−0.9%)	\$47,529 (+7.2%)
Ages 35-44	\$26,867 (+5.0%)	−\$351 (+3.8%)	\$1,621 (−3.3%)	\$220 (−0.2%)	\$28,951 (+5.3%)
Ages 45-54	\$15,917 (+4.4%)	−\$199 (+2.0%)	\$1,264 (−2.4%)	−\$536 (+0.2%)	\$17,539 (+4.8%)
Ages 55-64	\$5,232 (+3.6%)	−\$135 (+1.0%)	\$464 (−1.8%)	−\$117 (+0.2%)	\$5,941 (+3.8%)

Decomposing ACA Policy by Demographics

Group	Premium subsidies	Individual mandate	Community rating	Limited age rating	Whole ACA
Healthy	\$28,417	−\$1,426	\$1,411	\$76	\$29,078
	(+5.8%)	(+4.9%)	(−3.2%)	(−0.4%)	(+5.6%)
Unhealthy	\$29,952	−\$1,522	\$9,543	\$624	\$33,361
	(+3.8%)	(+0.3%)	(+4.0%)	(+0.2%)	(+5.4%)
High income	−\$2,452	\$2,523	−\$2,207	\$59	−\$750
	(+0.8%)	(+1.3%)	(−2.4%)	(−0.3%)	(+1.0%)
Mid income	\$35,266	\$195	\$2,152	\$40	\$36,166
	(+5.2%)	(+4.9%)	(−2.8%)	(−0.4%)	(+5.3%)
Low income	\$27,362	−\$7,391	\$4,798	\$124	\$29,129
	(+10.3%)	(+4.0%)	(−2.4%)	(+0.0%)	(+10.1%)
Not offered	\$57,221	−\$6,764	\$3,813	\$422	\$56,821
	(+26.8%)	(+21.8%)	(−12.8%)	(−1.4%)	(+28.2%)
Offered ESI	\$21,467	−\$120	\$1,662	\$47	\$22,692
	(+0.4%)	(+0.2%)	(−0.1%)	(−0.1%)	(+0.0%)

Concluding Remarks

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    - Alternative ACA financing schemes
    - Changing policy parameters: increase eligibility cap?

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- Further policy counterfactuals to explore:
  - Alternative ACA financing schemes
  - Changing policy parameters: increase eligibility cap?
- Model extensions and improvements:
  - More sophisticated income taxes
  - Endogenize extensive margin of medical care
  - Improved specification of health dynamics
  - Combine with work on health investment

THANK YOU!

(Stop scrolling, Matt)

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Background: Pre-ACA Insurance Market

- Most private insurance plans are employer-sponsored (ESI)
- ESI **not** individually rated on health (HIPAA & ADA)
- ESI can be individually rated on age... but uncommon

Back to background

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- Less robust than group plans: higher cost sharing, excluded services, annual and lifetime caps on benefits

Back to background

Literature & Contribution

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- “Macro health”: Hsu (2013); Paschenko & Porapakkarm (2013); Chivers, Feng, & Villamil (2017); Ferreira & Gomes (2017); Jung & Tran (2016); Zhao (2017), etc

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- This paper tries to find a happy medium of approaches to focus on question of welfare heterogeneity

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State Variables

Agent i's personal circumstances at time t are characterized by...

- e_i education (dropout, high school, college)
- j_{it} age in years (22 to 120)
- h_{it} categorical health status (poor to excellent)
- o_{it} categorical ESI status (four states)
- Y_{it} permanent income or labor productivity
- b_{it} bank balances or cash on hand

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Control Variables

Agent i makes choices at time t about...

- c_{it} consumption Budget set
- m_{it} medical care Medical needs

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Control Variables

Agent i makes choices at time t about...

- c_{it} consumption Budget set
- m_{it} medical care Medical needs
- z_{it} medical insurance (none, IMI, ESI, Medicare) Insurance choice
- Choice of insurance is a **state variable** after being chosen

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Shock Variables

Agent i faces risk at time t from...

- ψ_{it} persistent shock to labor income Income process
- ξ_{it} transitory shock to labor income

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- Transitions among categorical health states Health process
- Transitions among ESI offer status ESI process

Back to sequence

Utility and Preferences

$$u(c, m; \eta) = \frac{c^{1-\rho}}{1-\rho} + \frac{(m/\eta)^{1-\nu}}{1-\nu}, \qquad \nu > 1.$$

- Future utility discounted by factor β per year

Back to overview

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- Higher ν makes medical care more of a necessity good

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Labor Income Dynamics

- Idiosyncratic permanent labor productivity is Y_{it}.
- When under 65, $\log(Y_{it})$ evolves as an AR(1):

$$Y_{it} = \exp(\kappa \log(Y_{it-1}) + \psi_{it}), \qquad \psi_{it} \sim N(-\sigma^2_{\psi j}/2, \sigma^2_{\psi j}).$$

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- Retirement at age 65; no labor income dynamics thereafter
- SocSec income determined by approximation to AIME formula

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ESI Offer Status Dynamics

Working age agents have ESI offer status o_{it} :

$$o_{it} \in \begin{cases} 1: & \text{not offered ESI, can buy IMI} \\ 2: & \text{offered ESI, but must pay entire premium} \\ 3: & \text{offered ESI, pays some of the premium} \\ 4: & \text{offered ESI, pays none of the premium} \end{cases}$$

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- Exogenous transition in each working period
- Transitions in and out of $o_{it} = 1$ depend on age, income, educ
- Probabilities among $o_{it} = 2, 3, 4$ are constant, except age 60+
- Retired agents have no ESI offer status, get Medicaid

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Health Dynamics & Mortality

- Health status is discrete: five states (plus death)
- Exogenous transitions among health states (no investment)

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Health Dynamics & Mortality

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- 60-95 mortality estimated as probit on health & quartic in age
- < 60 and > 95 mortality calibrated to match SSA table
- Enter model at age 22, lifespan capped at 120 years

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Medical Need Shocks

- Medical need shock η_{it} drawn from dstn $f_\eta(\eta \mid j_{it}, h_{it})$
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- 24 medical need distribution parameters to estimate!

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Insurance Choice

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$$OOP_{it} = \min(m_{it}, \quad km_{it} + (1-k)d) \equiv z_{it}(m_{it}).$$

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- IMI policies z_I have \$1000 deductible and 8% coinsurance rate
- IMI premium p_I can depend on age and health status

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Insurance Choice

Menu of insurance contracts Z_{it} given by:

$$Z_{it} = \begin{cases} \{z_0, z_I\} & \text{if } \; j_{it} < 65 \;\&\; o_{it} = 1 \\ \{z_0, z_I, z_E \equiv (p_E - 0, 0.08, \$400)\} & \text{if } \; j_{it} < 65 \;\&\; o_{it} = 2 \\ \{z_0, z_I, z_C \equiv (p_E - s, 0.08, \$400)\} & \text{if } \; j_{it} < 65 \;\&\; o_{it} = 3 \\ \{z_0, z_I, z_F \equiv (p_E - p_E, 0.08, \$400)\} & \text{if } \; j_{it} < 65 \;\&\; o_{it} = 4 \\ \{z_M\} & \text{if } \; j_{it} \geq 65 \end{cases}.$$

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Household Budget

Household budget dynamics given by:

$$b_{it} = Ra_{it-1} + y_{it},$$

$$b'_{it} = b_{it} - p_{it},$$

$$a_{it} = b'_{it} - c_{it} - z_{it}(m_{it}) \geq 0.$$

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- Insurance contract z_{it} determines OOP medical spending
- Hard liquidity constraint at zero assets

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Consumption Floor & Welfare

- Medical need shocks η_{it} unbounded above, but resources finite
- Massive utility risk when $m_{it} \ll \eta_{it}$, as $\mathrm{u}(c_{it}, m_{it}; \eta_{it}) \to -\infty$

Back to choices   Back to control variables

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- Massive utility risk when $m_{it} \ll \eta_{it}$, as $\mathrm{u}(c_{it}, m_{it}; \eta_{it}) \to -\infty$
- Government implements consumption floor $\underline{c}$ as social welfare
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$$a_{it} = 0, \qquad c_{it} = \underline{c}, \qquad m_{it} = k^{-1/\nu} \eta_{it}^{1-1/\nu} \underline{c}^{\rho/\nu}.$$

Back to choices Back to control variables

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Back to choices | Back to control variables

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- Cost of consumption floor bundle remaining after a_{it} used is funded by government as “welfare” (Medicaid, etc)

Back to choices Back to control variables

Nested Solution Method

- Optimal behavior depends on future premiums when older...
- ...but premiums depend on expected medical benefits...

Back to overview

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Back to overview

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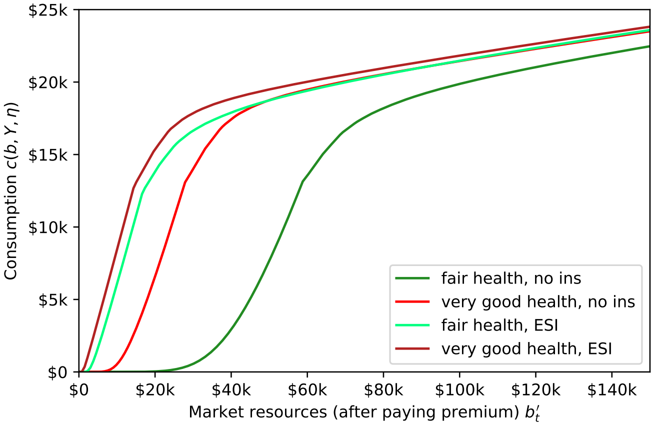
- Need to do this for every structural parameter guess!

Back to overview

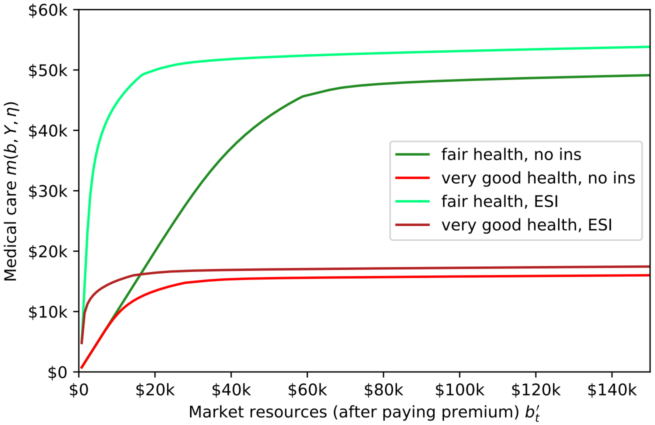
Example Consumption Functions



(45 y.o. HS-educated man, \$30k perm inc, η_{it} 2 s.d. above mean)

Back to agent's solution

Example Medical Care Functions



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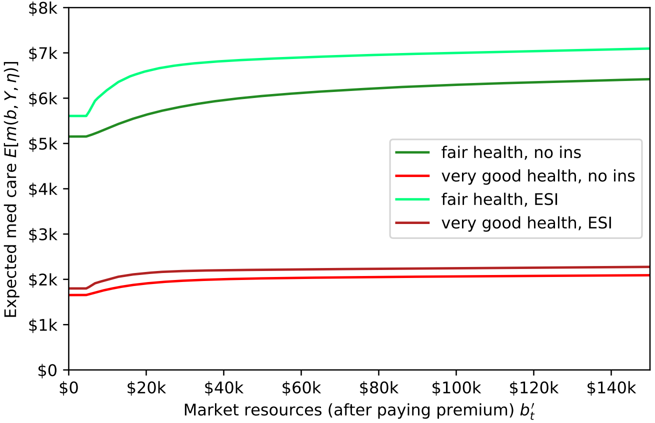
Back to agent's solution

Example Expected Medical Care Functions



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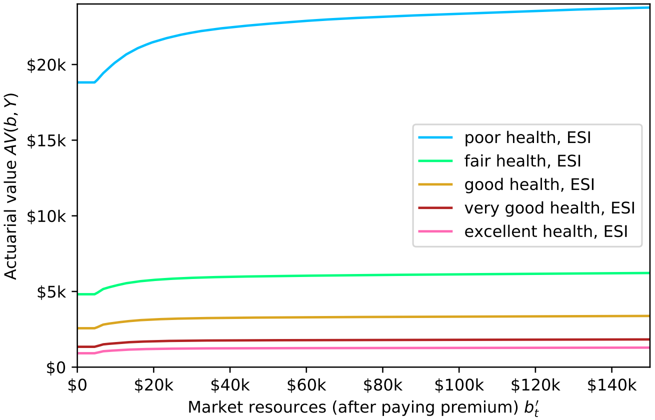
Back to agent's solution

Example Actuarial Value Functions



(45 y.o. HS-educated man, $30k perm inc) Back to agent's solution

Equilibrium Tax Rate

- Medicare and consumption floor are government spending
- Counterfactual policies offer subsidies and collect taxes

Back to solution

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Back to solution

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- Tax revenue received must equal government medical spending
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- Later: implement more sophisticated income tax scheme

Back to solution

MEPS Data for Estimation

- Categorical health: excellent, very good, good, fair, poor
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Back to MEPS

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- Whether employer made *any* contribution to ESI
- Household's labor income
- Respondent's education level: dropout, HS, college

Back to MEPS

Other Data Sources for Estimation

- MEPS has poor data on wealth of respondents
- Use wealth & income data from Survey of Consumer Finance (2007, 2010, 2013 waves)

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- Social Security Administration mortality table
- Health and Retirement Study: mortality probit by age-health

Back to MEPS

Identification Overview

Param(s)	Identifying data features
β	Slope of mean wealth-income ratio by age
ρ	Level of ESI and IMI uptake rate
ν	Variation by income in mean log OOP medical costs
$\underline{c}$	Variation by income quintile in IMI uptake rate
s	Mean out-of-pocket premiums for ESI
γ_0^h	Variation by health in level of mean log total medical costs
γ_1^h	Variation by health in age-slope of mean log total medical costs
$\gamma_2, \gamma_3, \gamma_4$	Non-linear shape of mean log total medical costs by age
δ_0^h	Variation by health in level of stdev log total medical costs
δ_1^h	Variation by health in age-slope of stdev log total medical costs
δ_2	Curvature of stdev log total medical costs by age

More identification details   Back to estimation

Identification of Preferences

- This model has intra- *and* inter-temporal risk management

Back to identification

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Back to identification

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- Higher ν makes medical care more of a necessity good
- ρ/ν identified by income gradient in medical care

Back to identification

Identification of Preferences

ρ/ν identified by income gradient in medical care:

$$\text{FOC:} \quad m_{it} = \eta_{it}^{1-1/\nu} k_{it}^{-1/\nu} c_{it}^{\rho/\nu} \Longrightarrow$$

Back to identification

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Back to identification

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Back to identification

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$$\frac{d\,\mathrm{E}\left[\log m_{it}\right]}{d \log Y_{it}} = \left(1 - \frac{1}{\nu}\right) \underbrace{\frac{d\,\mathrm{E}\left[\log \eta_{it}\right]}{d \log Y_{it}}}_{\approx 0} - \frac{1}{\nu} \underbrace{\frac{d\,\mathrm{E}\left[\log k_{it}\right]}{d \log Y_{it}}}_{\approx 0} + \frac{\rho}{\nu} \underbrace{\frac{d\,\mathrm{E}\left[\log c_{it}\right]}{d \log Y_{it}}}_{\approx 1} \approx \frac{\rho}{\nu}.$$

Back to identification

Identification of Money Parameters

- Consumption floor $\underline{c}$ provides catastrophic insurance
- More likely to bind for low income than high income agents

Back to identification

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- Fraction of agents who pay some/none/all is calibrated
- Employer contribution s identified by OOP ESI premiums

Back to identification

Estimated Parameters for Mean Medical Needs

	Est	Std Err	Description
γ_0^E	-3.587	(0.036)	Excellent health constant for mean log med shock
γ_0^V	-3.418	(0.035)	Very good health constant for mean log medical need shock
γ_0^G	-3.058	(0.039)	Good health constant for mean log medical need shock
γ_0^F	-2.537	(0.064)	Fair health constant for mean log medical need shock
γ_0^P	-1.086	(0.078)	Poor health constant for mean log medical need shock
γ_1^E	3.42e-2	(0.11e-2)	Excellent health linear coefficient on age for mean log med shock
γ_1^V	3.79e-2	(0.10e-2)	Very good health linear age coefficient for mean log med shock
γ_1^G	3.63e-2	(0.10e-2)	Good health linear age coefficient for mean log med shock
γ_1^F	3.44e-2	(0.14e-2)	Fair health linear age coefficient for mean log med shock
γ_1^P	2.01e-2	(0.18e-2)	Poor health linear age coefficient for mean log med shock
γ_2	-1.53e-3	(0.04e-3)	Quadratic coefficient on age for mean log medical need shock
γ_3	6.04e-5	(0.16e-5)	Cubic coefficient on age for mean log medical need shock
γ_4	-5.89e-7	(0.19e-7)	Quartic coefficient on age for mean log medical need shock

Back to parameter estimates

Estimated Parameters for Stdev Medical Needs

	Est	Std Err	Description
δ_0^E	0.409	(0.009)	Excellent health constant for stdev log med shock
δ_0^V	0.362	(0.010)	Very good health constant for stdev log medical need shock
δ_0^G	0.575	(0.014)	Good health constant for stdev log medical need shock
δ_0^F	0.626	(0.028)	Fair health constant for stdev log medical need shock
δ_0^P	0.733	(0.036)	Poor health constant for stdev log medical need shock
δ_1^E	7.07e-4	(3.94e-4)	Excellent health linear coefficient on age for stdev log med shock
δ_1^V	2.81e-3	(0.39e-3)	Very good health linear age coefficient for stdev log med shock
δ_1^G	-1.80e-3	(0.56e-3)	Good health linear age coefficient for stdev log med shock
δ_1^F	-1.51e-3	(0.80e-3)	Fair health linear age coefficient for stdev log med shock
δ_1^P	-2.67e-3	(0.74e-3)	Poor health linear age coefficient for stdev log med shock
δ_2	-2.59e-5	(0.65e-5)	Quadratic coefficient on age for stdev log medical need shock

Back to parameter estimates

Compensating Variation in Permanent Income

- Simulated agent i has age j_{it} and education e_i
- State is $(b_{it}, Y_{it}, h_{it}, o_{it}) \equiv$ (money, perm inc, health, offer)

Back to counterfactual basics

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- That's just a univariate search for each agent!

Back to counterfactual basics

Willingness-to-Pay Calculation

- For each simulated agent, have j_{it}, e_i, h_{it}, Y_{it}, and $\widetilde{Y}_{it}$
- Calc present value of expected lifetime income for Y_{it} & $\widetilde{Y}_{it}$

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$$\begin{aligned} WTP_{it} &\equiv \mathrm{E}_t\left[\sum_{s=j} R^{j-s}(1-\mathrm{d}_{is})y_{is} \,\middle|\, Y_{it}, e_i, j_{it}, h_{it}\right] \\ &- \mathrm{E}_t\left[\sum_{s=j} R^{j-s}(1-\mathrm{d}_{is})y_{is} \,\middle|\, \widetilde{Y}_{it}, e_i, j_{it}, h_{it}\right]. \end{aligned}$$

Back to counterfactual basics

Private Insurance Subsidies

- Formally: advance premium tax credits (APTC)
- Eligibility: income 100-400% of FPL, not offered ESI

Back to reform policies

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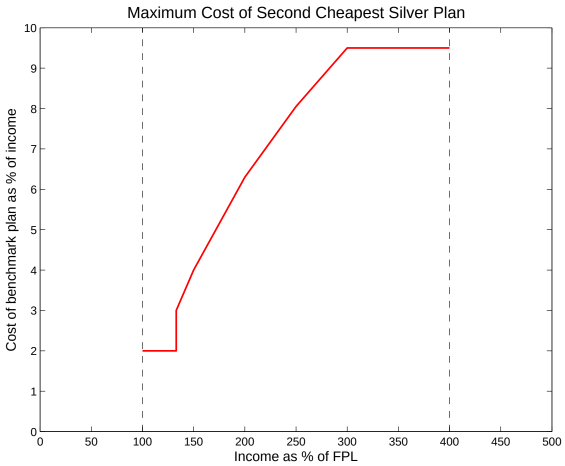
- Real world: benchmark is second cheapest "silver" plan
- Model: only one IMI plan, and it's the benchmark

Back to reform policies

APTC Subsidy Calculation



Individual Mandate Tax Penalty

- ACA as written imposes 2.5% income tax penalty if uninsured
- Minimum penalty is $695, maximum is lowest "bronze" prem

Back to reform policies

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- Model: state-dependent increase in price of null contract z_0

Back to reform policies

Community Health Rating & Limited Age Rating

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Back to reform policies

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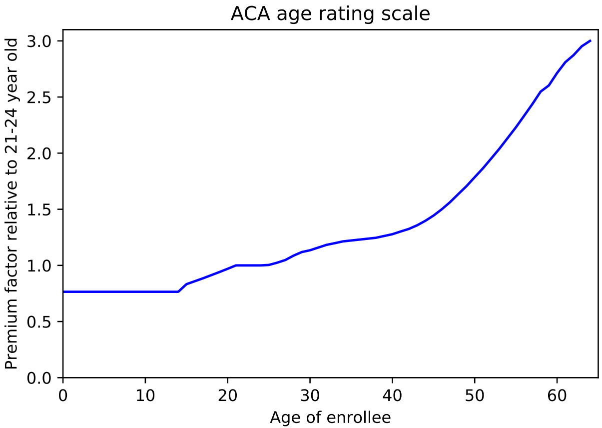
- Model: One insurance pool for all ages, find **one** IMI premium

Back to reform policies

Limited Age Rating



Decomposing the ACA

- Add APTC subsidies to pre-ACA baseline Add APTC subsidies
- Remove APTC subsidies from the ACA Remove APTC subsidies
- Add individual mandate to pre-ACA baseline Add individual mandate
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- Add community rating to pre-ACA baseline Add community rating
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Back to decomposition

Decomposition: Adding Insurance Subsidies

- Subsidies greatly reduce OOP cost of IMI premiums even if full premium remains high (for unhealthy)
- But funds needs to be raised through higher taxes

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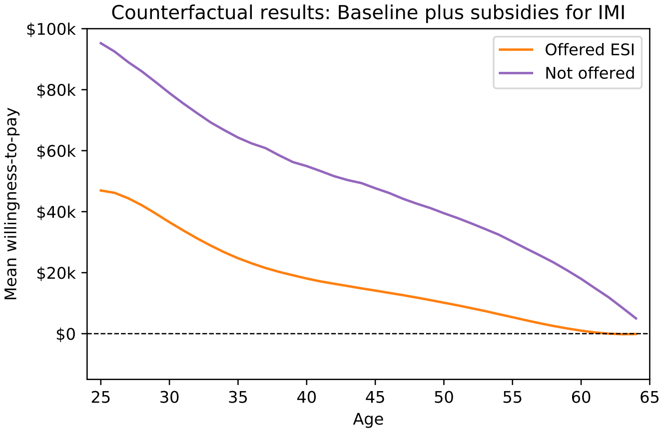
- Mean WTP closely tracks with overall ACA
- Welfare effects of the ACA are dominated by APTC
- IMI uptake change similar to overall ACA **except** for high income, who are ineligible (above 400% FPL)

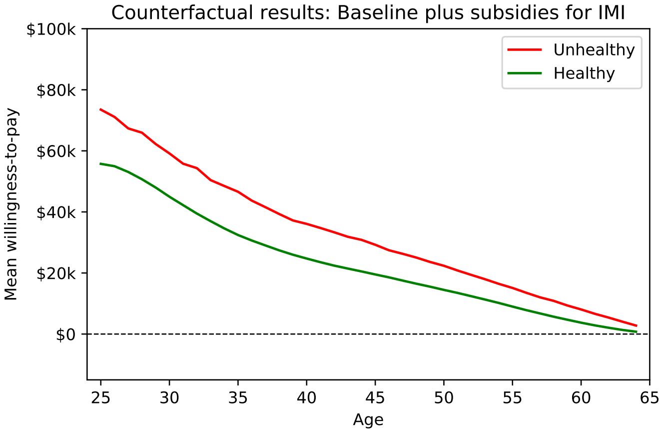
Back to decomposition

Mean WTP for APTC by ESI Offer Status



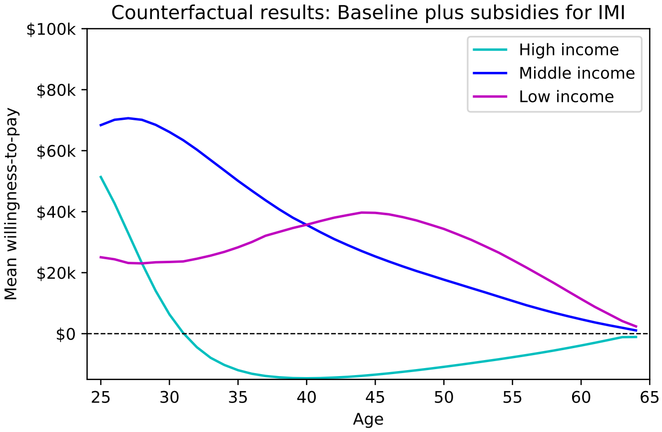
Back to decomposition

Mean WTP for APTC by Health Status



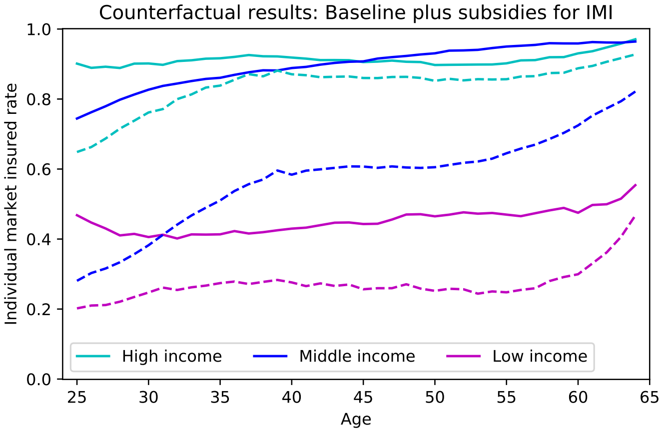
Back to decomposition

Mean WTP for APTC by Income



Back to decomposition

IMI Insured Rate by Income with APTC



Back to decomposition

Decomposition: Removing Insurance Subsidies

- What if we stopped offering APTC subsidies for IMI plans?

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Back to decomposition

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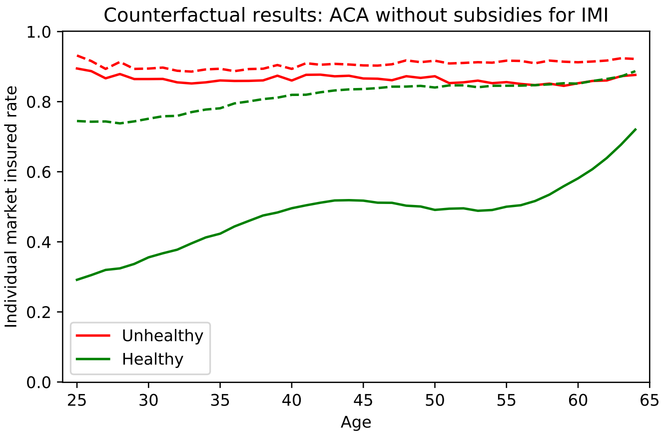
- What if we stopped offering APTC subsidies for IMI plans?
- Many healthy workers unwilling to pay full premium, drop coverage
- Some only retain IMI because of the individual mandate
- Few unhealthy workers drop coverage: still relatively cheap!
- Model predicts IMI premiums would increase by 26.5%
- Large welfare losses for most groups (asymmetric due to IM)

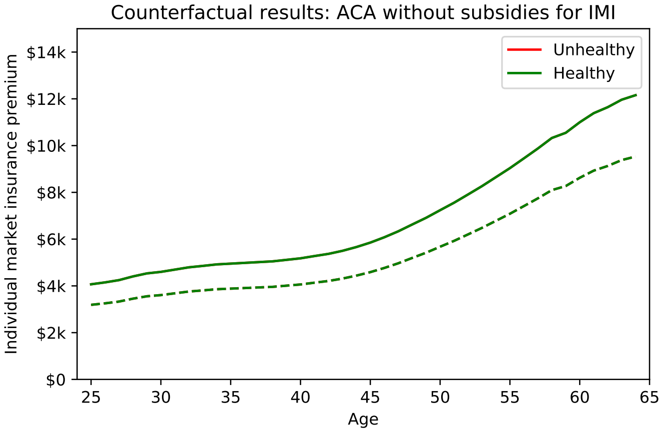
Back to decomposition

IMI Insured Rate When Dropping APTC Subsidies



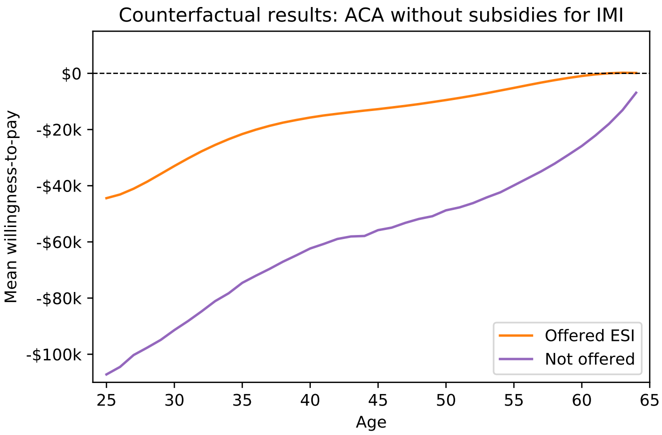
Back to decomposition

IMI Premiums When Dropping APTC Subsidies



Back to decomposition

Mean WTP to Drop APTC by ESI Offer Status



Back to decomposition

Decomposition: Adding Individual Mandate

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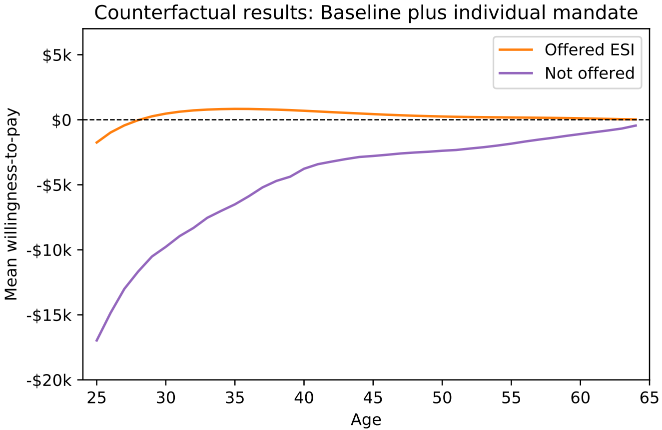
- Who never pays the penalty? High income people with ESI
- People **hurt** by mandate were already in "bad states"
- The individual mandate is a regressive policy
- Strong motivator for young and/or high income to buy IMI

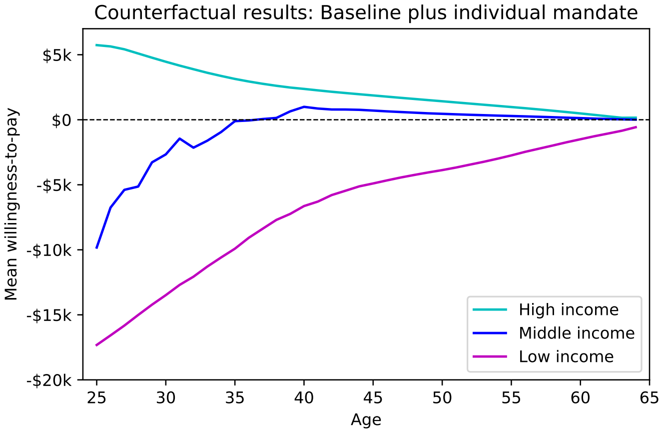
Back to decomposition

Mean WTP for Individual Mandate by ESI Offer Status



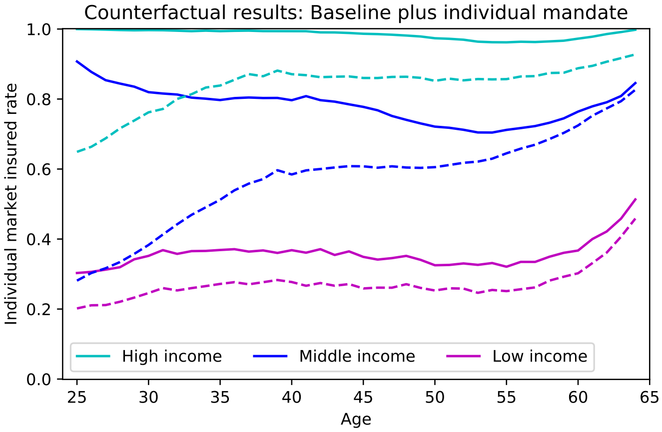
Back to decomposition

Mean WTP for Individual Mandate by Income



Back to decomposition

IMI Insured Rate by Income with Individual Mandate



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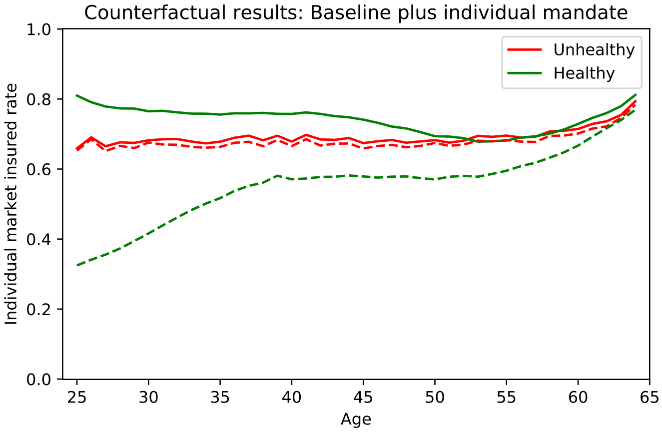
IMI Insured Rate by Health with Individual Mandate



Back to decomposition

Decomposition: Removing the Individual Mandate

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- What does the model say will happen?

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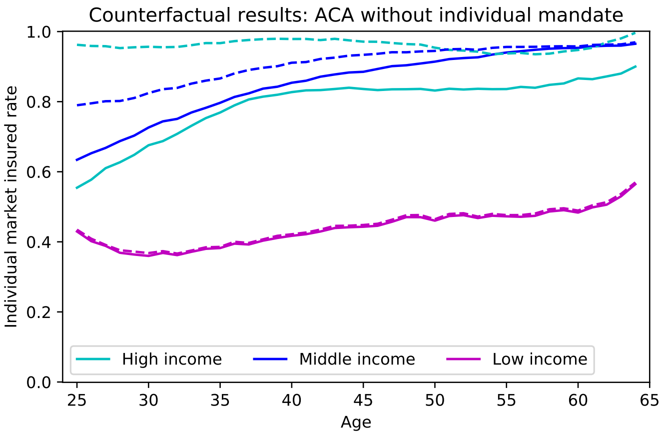
- What does the model say will happen?
- High income, healthy people withdraw from IMI market
- IMI premiums increase by about 4%
- Reality: individual mandate repeal increased premiums $\sim$ 8%
- Only 22% of workers have positive WTP (62% for 22-25)

Back to decomposition

IMI Insured Rate by Income When Dropping Individual Mandate



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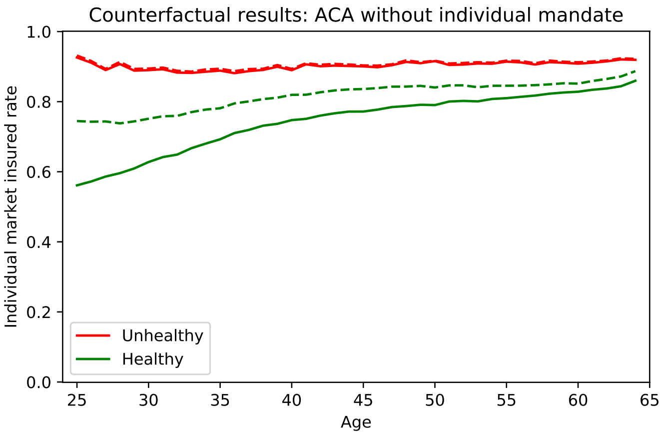
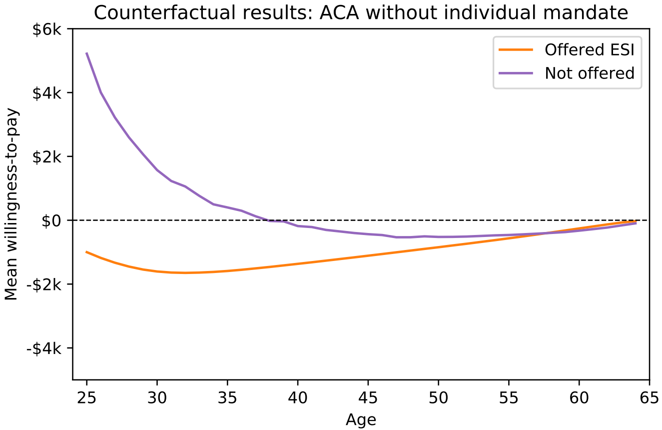
IMI Insured Rate by Health When Dropping Individual Mandate



Back to decomposition

Mean WTP to Drop Individual Mandate by ESI Offer Status



Back to decomposition

Decomposition: Adding Community Rating

- Combine healthy and unhealthy in one pool (by age)
- Fix who buys IMI; premium would be health-weighted avg

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- Fix who buys IMI; premium would be health-weighted avg
- Premium **decreases** for unhealthy and **increases** for healthy
- More unhealthy would want IMI, fewer healthy want IMI
- Equilibrium premium is greater than health-weighted avg
- Large welfare gain for unhealthy, small loss for healthy
- But there are many more healthy than unhealthy!

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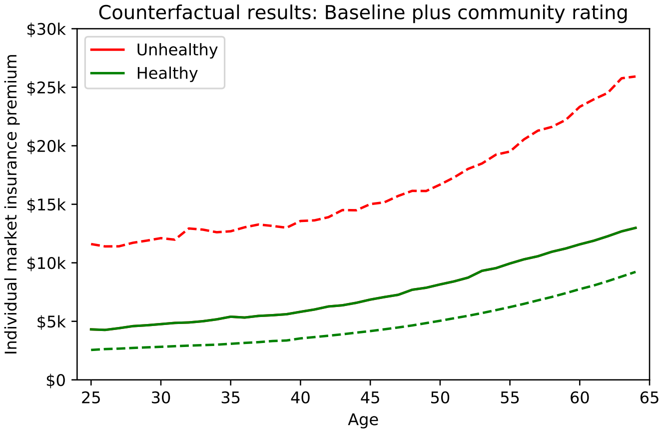
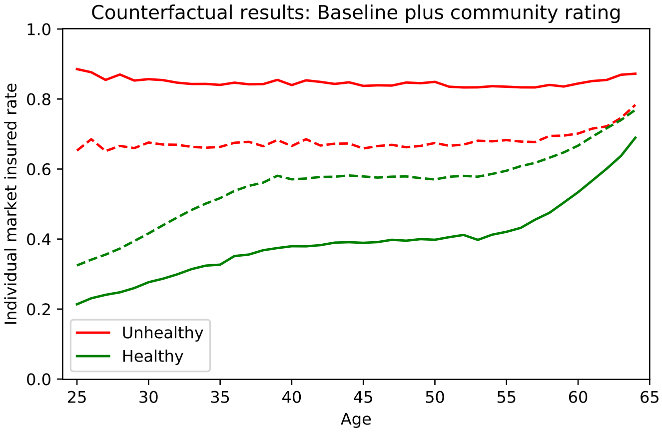
IMI Premiums Under Community Rating



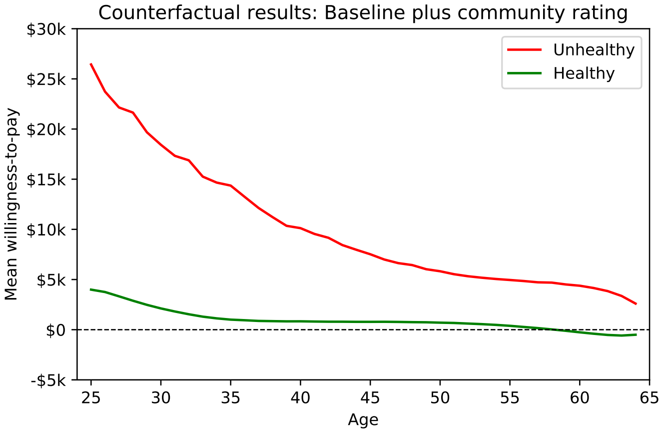
Back to decomposition

IMI Insured Rate by Health with Community Rating



Back to decomposition

Mean WTP for Community Rating by Health



Back to decomposition

Decomposition: Removing Community Rating

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Back to decomposition

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- 92% of workers would pay to **keep** community rating

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Decomposition: Removing Community Rating

- Community health rating **in isolation** hurts about 67% agents
- What about in conjunction with other ACA provisions?
- 92% of workers would pay to **keep** community rating
- Losing community rating risks exposure to very high premiums if you lose ESI while unhealthy but high income
- Even healthy people have positive WTP on average

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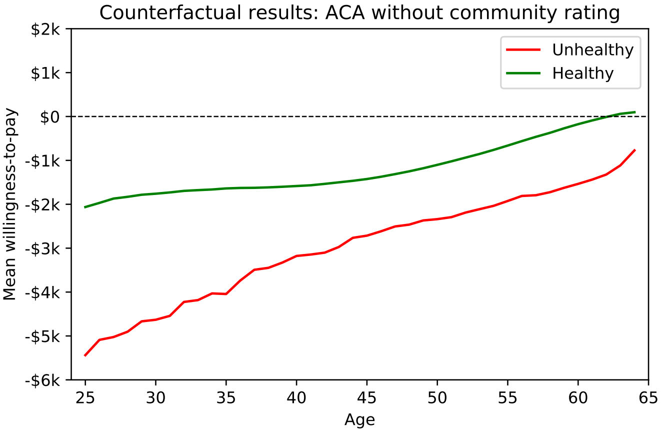
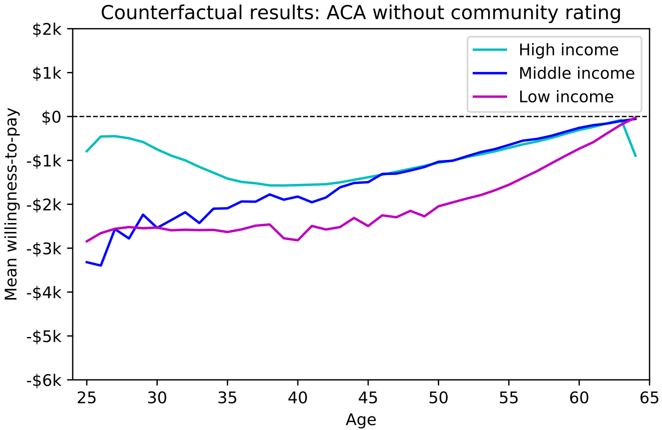
Mean WTP to Drop Community Rating by Health



Back to decomposition

Mean WTP to Drop Community Rating by Income



Back to decomposition

Decomposition: Adding Limited Age Rating

- What if the 3:1 ratio of 64 to 24 y.o. premiums were implemented on its own?

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- Not much! 3:1 is close to "right" ratio **within** each health group
- Shape of statutory premium profile also pretty close

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- Not much! 3:1 is close to “right” ratio **within** each health group
- Shape of statutory premium profile also pretty close
- Result: premiums shift slightly at all ages, small change in insured rate
- Small welfare effects, non-monotonic in age

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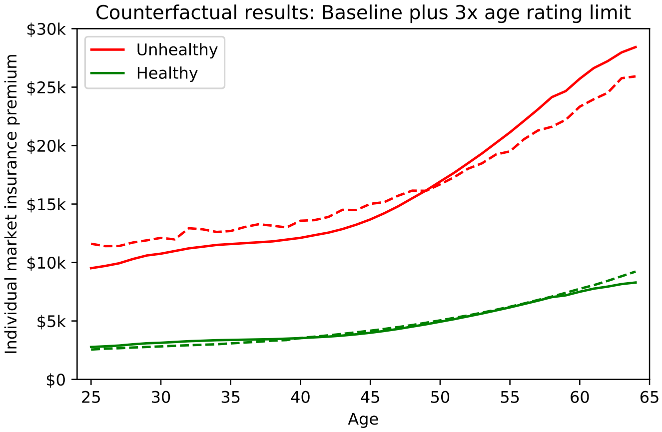
IMI Premiums When Adding Limited Age Rating



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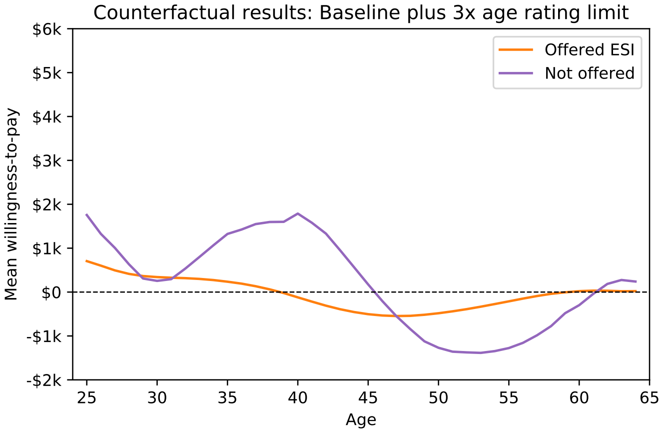
Mean WTP When Adding Limited Age Rating by ESI Offer



Back to decomposition

Decomposition: Removing Limited Age Rating

- Limited age rating **in isolation** has very limited effect
- Small, non-monotone changes to premiums, uptake, welfare

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- Ratio of 64- to 24-year-old premium goes from 3 to ~ 5.5

Back to decomposition

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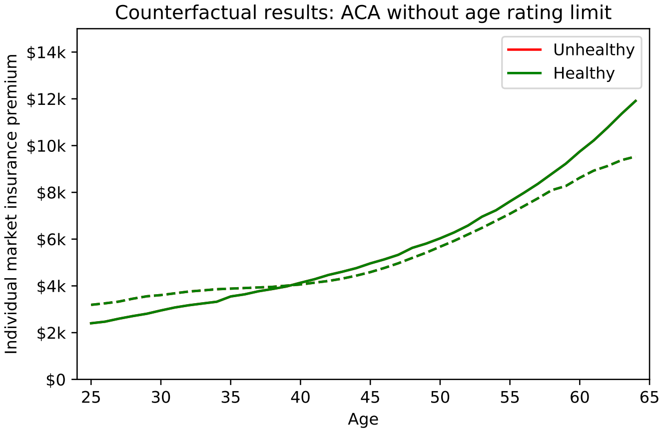
- Small, non-monotone changes to premiums, uptake, welfare
- Effects of **eliminating** limited age rating more interesting
- Ratio of 64- to 24-year-old premium goes from 3 to ~ 5.5
- Would benefit young people by about \$900 on average...
- ...but 94% of all workers have negative WTP for it

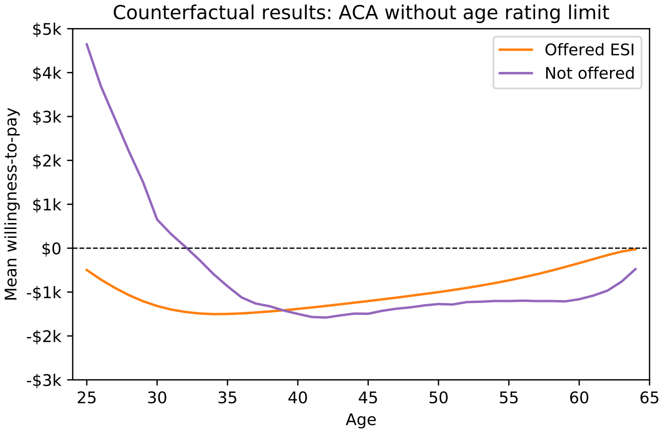
Back to decomposition

IMI Premiums When Dropping Limited Age Rating



Back to decomposition

Mean WTP to Drop Limited Age Rating by ESI Offer



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