Medicaid Work Requirements, Labor Market Effects and Welfare

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Introduction

- Many US states have been attempting to introduce work requirements for Medicaid via Section 1115 Medicaid demonstration waivers
- Despite legal challenges it is active policy issue in some states
- Advocates
  - Work requ. encourage self-sufficiency and reduce financial burden on states
  - Growth effects due to lower taxes
- Opponents
  - Concerns about potential harm for vulnerable populations
  - Effectiveness? Large share of Medicaid recipients already works (admin burden)

Implemented work requirements

- Short-lived implementation in Arkansas in 2018 (Sommers et al., 2020)
  - Work requirement 20 hrs/week, age 30–49 w/ income threshold of 138% of FPL
  - Arkansas expanded eligibility threshold to 138% of FPL in 2014 via ACA
  - Exemptions: pregnant women and the disabled
  - 18,000 people lost Medicaid coverage (25% of population subject to requirement)
  - Most lost coverage due to failure to report work status or document eligibility for exemption, rather than non-compliance with work activities

- Ongoing implementation $\Rightarrow$ Georgia (since July 2023, CMS, 2020)
  - Work requ. 20 hrs/week of age 30–49 + expansion of income threshold from 31% of FPL to 100%
  - Georgia is one of the 10 states that have NOT expanded Medicaid via ACA

This paper

- OLG model w/ partially endogenous health + disability shocks
  - HH choose C, S, **labor** (extensive + intensive margins) and **health insurance**
  - Calibrated to US data before ACA
- **Simulate** Medicaid work requirements similar to Arkansas/Georgia
- Analyze short-run (PE) and long-run (GE) effect of 3 work requirement scenarios w/ 20 hours/week, nationwide implementation
  1. Healthy only (mostly discussed in past/current proposals)
  2. Healthy & sick (concern that requirements could target sick also)
  3. Healthy & sick & disabled (unlikely, probably too extreme?)

Results: 20 Hrs Work Requ. for Healthy (PE)

- Labor markets
  - Increase in labor participation of **low income/healthy** types
  - No change in labor participation of high income/healthy types
  - Weekly work hours $\uparrow$ slightly
- Insurance
  - Fraction w/ IHI. $\uparrow$ by 0.5%
  - Fraction w/ GHI (from employer) $\uparrow$ by about 2%
  - Fraction w/ Medicaid $\downarrow$ from 5% to 1.7%
- Transfers
  - Medicaid payments $\downarrow$ 30%
  - Social insurance transfers $\uparrow$ 25%
- Welfare
  - Overall welfare **losses** of -0.5% CEV
  - Low income/poor health large welfare losses up to -2.8 CEV

Results: 20 Hrs Work Requ. for Healthy (GE)

- Aggregates
  - $K \uparrow 1.1\% \Rightarrow$ GDP $\uparrow 0.8 \Rightarrow$ C $\uparrow 1\%$
- Labor
  - Labor employed $\uparrow 1.3\%$
  - Labor part. $\uparrow 1.2\%$ (extensive margin)
  - Wages $\uparrow$
  - Weekly hours $\downarrow$ slightly
- Insurance markets
  - IHI premiums $\downarrow 5\%$ but GHI premiums unchanged
  - Medicaid transfers $\downarrow$ (slightly less than PE)
  - More SI transfers than under PE
- Welfare
  - Welfare gains $+0.12\%$ CEV(compared to losses -0.5% under PE)
  - Welfare losses of poor -1.9% CEV (compared to -2.8% under PE)
- ACA alleviates negative welfare effects under PE and GE

Mechanism

- Restricting Medicaid w/ work requirement provides strong work incentive to low income/good health HH
- Medicaid transfers $\downarrow \Rightarrow$ Social insurance transf. $\uparrow \Rightarrow$ overall $\downarrow$ Income labor tax (smaller transfer financing need)
- Labor supply $\uparrow$, K $\uparrow \Rightarrow$ GDP $\uparrow$
- High income: higher wages, less taxes, additional income, C $\uparrow$, clear welfare benefits
- Low income:
  - Benefit from trickle down (we call it GE effects): higher wages
  - BUT no significant tax benefit (were exempt or in low brackets)
  - Less leisure
  - Lost insurance $\Rightarrow$ now have premium payments $\Rightarrow$ higher health expenditures overall
  - In sum $\Rightarrow$ worse off $\Rightarrow$ welfare losses (trickle down not enough)

Related literature I

- Medicaid and labor market effects
  - Early studies $\Rightarrow$ NO or **small positive** effects on labor supply after initial intro of Medicaid in 1965 (Strumpf, 2011)
  - Expansions of Medicaid in 1980s linked to $\downarrow$ labor supply among the eligible population (e.g., Dave et al. 2015; Peng, Guo and Meyerhoefer 2020)
  - Long-run effects of Medicaid eligibility linked to better health outcomes and higher wages (Brown, Kowalski and Lurie, 2020)
  - Lowering access burden to Medicaid in 1980s: $\uparrow$ in insured + improvements in infant health, especially for minority mothers (Rauscher and Burns, 2023)
  - The short-lived work requirement implementation in Arizona suggests disproportionate negative effects for African Americans (Sommers et al., 2019)
- Economic effects of ACA
  - Reviews of ACA lit in Fang and Krueger (2022);
  - Closely related studies address access to health care, health and labor market outcomes, crime, education, and marriage: Wen, Hockenberry and Cummings, 2017; Miller, Johnson and Wherry, 2021; Jung and Shrestha, 2018; Hampton and Lenhart, 2019.

Related literature II

- Insurance take up driven by Medicaid: Peng, Guo and Meyerhoefer (2020), Frean, Gruber and Sommers (2017) and Courtemanche et al. (2017)
- ACA and health outcomes using self-reported health $\Rightarrow$ results mixed:
  - Up to 2 year follow up period studies are Miller and Wherry, 2017; Courtemanche et al., 2018; Cawley, Soni and Simon, 2018
  - Longer follow-up period studies document improved health outcomes, particularly those population experiencing large gains in insurance coverage: Sommers et al., 2017; Gruber and Sommers, 2019; Allen and Sommers, 2019; Miller, Johnson and Wherry, 2021

- Macro-health economics
  - Capatina and Keane (2024); De Nardi, Pashchenko and Porapakkarm (2024);Hosseini, Kopecky and Zhao (2021); Mahler and Yum (2024); Chen, Feng and Gu (2025)
  - Jung and Tran (2023); Jung and Tran (2016); Capatina (2015); De Nardi, French and Jones (2010); Jeske and Kitao (2009); etc.

This paper: Simulate Medicaid work requirements in OLG model with exogenous health & disability shocks and choice of labor (both margins) + insurance

Detailed references

Overlapping generations model

Bewley with Partial Endogenous Health States

- Overlapping Generations w/ heterogeneous agents
- Lifespan: age 20–94
- **Idiosync. shocks** (i) health (ii) disability (iii) employer type (iv) labor
- Partially endogenous health state (via insurance choice in $t-1$)
  - Health dependent survival + accidental bequests
  - Health + disability dependent income profiles
  - Partially endogenous health spending
- Health insurance
  - Public HI with eligibility criteria: Medicaid (poor) & Medicare (old or disabled)
  - Choice of private HI: Individual HI & Group HI
- Markets: consumption good, capital, labor & incomplete financial markets
- Progressive income tax, Social Security, payroll taxes, SSDI, min. cons. program
- General equilibrium

Model details

Heterogeneity

- Five exogenous health states: $\epsilon^h \in \{1, 2, 3, 4, 5\}$
- Health expenditure: $m\left(j, \vartheta, \epsilon^h\right)$ depends on age, health & education
- Health/Sick groups:

$$h\left(\epsilon^h\right) = \begin{cases} \text{healthy} & \text{if } \epsilon^h \in \{1.\text{ excellent, } 2.\text{ very good, } 3.\text{ good}\} \\ \text{sick} & \text{if } \epsilon^h \in \{4.\text{ fair, } 5.\text{ poor}\} \end{cases}$$

- Survival probability: $\pi\left(j, h\left(\epsilon^h\right)\right)$
- Disability shock: $\epsilon^{\text{di}} \in \{0, 1\}$
- Human capital: $e\left(j, \vartheta, \epsilon^n, h\left(\epsilon^h\right), \epsilon^{di}\right)$
- Health, disability, wage & GHI offer shocks:
  $\Pr\left(\epsilon^h_{j+1} | \epsilon^h_j, j, \vartheta, ins\right) \in \Pi^h_{j,\vartheta,ins}$, $\Pr\left(\epsilon^{\text{di}}_{j+1} | \epsilon^{\text{di}}_j, j, \vartheta, h, ins\right) \in \Pi^{\text{di}}_{j,\vartheta,h,ins}$,
  $\Pr\left(\epsilon^n_{j+1} | \epsilon^n_j\right) \in \Pi^n$, $\Pr\left(\epsilon^{\text{GHI}}_{j+1} | \epsilon^{\text{GHI}}_j, j, \vartheta\right) \in \Pi^{\text{GHI}}_{j,\vartheta}$

Health Insurance of Working Age Individuals

- Private health insurance: group (GHI) or individual (IHI)
- Public (social) health insurance:
  Medicaid (for poor) or Medicare (for disabled)
- Health insurance status:

$$\text{in}_j = \begin{cases} 0 & \text{no insurance} \\ 1 & \text{private IHI} \\ 2 & \text{private GHI} \\ 3 & \text{Medicaid (if poor)} \\ 4 & \text{Medicare (if DI)} \end{cases}$$

- Coinsurance rates: $0 \leq \gamma^{\text{in}} \leq 1$
- Out-of-pocket medical spending

$$o_j(m) = \begin{cases} m & \text{if } \text{in}_j = 0 \\ \gamma^{\text{in}} \times m & \text{if } \text{in}_j > 0 \end{cases}$$

- Insurance pays: $\left(1 - \gamma^{\text{in}}\right) \times m$
- All retirees on Medicare/Medicaid (combo program)

Technology and Firms

- Final goods production sector

$$\max_{\{K,\ N\}} \left\{F\left(K, N\right) - q \times K - w \times N\right\}$$

- Firms offering GHI subsidizes fraction ψ of premium cost

- Firm passes costs c_E to employees e.g. Jeske and Kitao (2009)

$$\widehat{w} = \left(w - 1_{[\epsilon^{\text{GHI}}=1]} \times c_E\right)$$

- Remaining share of GHI premium $\widehat{\text{prem}}^{\text{GHI}} = (1-\psi) \times \text{prem}^{\text{GHI}}$ is tax deductible

More Details

Government I

- Revenue
  - Progressive income tax (Benabou (2002); Heathcote, Storesletten and Violante (2017)):

$$\tilde{\tau}\left(\tilde{y}\right) = \max\left[0,\ \tilde{y} - \lambda \times \tilde{y}^{(1-\tau)}\right]$$

    We model many transfers explicitly so force non-negative tax

  - Payroll taxes for SS and Medicare
  - Premiums for Medicare
  - Consumption tax, tax on bequests

- Spending
  - Unproductive C_G, Medicare, Medicaid, SI (foodstamps), SSDI

Worker Problem

- State vector: $x_j = \left\{\vartheta, a_j, \text{in}_j, \epsilon_j^n, \epsilon^h, \epsilon_j^{\text{GHI}}, \epsilon^{\text{di}}\right\}$
- Choice set: $\mathcal{C}_j \equiv \{(c_j, \ell_j, a_{j+1}, \text{in}_{j+1}) \in R^+ \times [0,1] \times R^+ \times \{0,1,2,3,4\}\}$

$$V(x_j) = \max_{\mathcal{C}_j} \left\{ u(c_j, \ell_j) + \beta \overbrace{\times \pi_j\left(h\left(\epsilon^h\right)\right)}^{\text{Health surv. channel}} \times \mathbb{E}\left[V(x_{j+1}) \mid x_j\right] \right\} \text{ s.t.}$$

$$(1+\tau^c)\, c_j + a_{j+1} + \overbrace{o_j\left(m_j\left(\epsilon^h\right)\right)}^{\text{Health spend. channel}}$$

$$+ \underset{\{\text{in}_{j+1}=1\}}{1\times} \text{prem}^{\text{IHI}}\left(j, \epsilon^h\right) + \underset{\{\text{in}_{j+1}=2\}}{1\times} \widehat{\text{prem}}_j^{\text{GHI}} + 1_{\{\text{in}_{j+1}=4\}} \text{prem}^{\text{MCare}} \overbrace{+\text{Tax}}^{\text{Health tax channel}}$$

$$= (1+r)\, a_j + \overbrace{\widehat{w}\times e_j\left(\vartheta, \epsilon_j^n, h\left(\epsilon^h\right)\right)}^{\text{Health income channel}}(1-\ell_j) + \overbrace{1_{\{\epsilon^{\text{di}}=1\}} b_{j,\vartheta}^{\text{DI}}}^{\text{DI inc. channel}} + b_j^{\text{SI}} + \left(1-\tau^{\text{Beq}}\right) b^{\text{Beq}}$$

$$\text{Tax} = T^y\left(y_j^{\text{T}}\right) + T^{\text{SS}}\left(y_j^{\text{SS}}; \bar{y}^{\text{SS}}\right) + T^{\text{MCare}}\left(y_j^{\text{SS}}\right)$$

More Details

Retiree Problem

- State vector: $x_j = \left\{\vartheta, a_j, \epsilon^h, \epsilon^{\text{di}}\right\}$
- Choice set: $\mathcal{C}_j \equiv \{(c_j, a_{j+1}) \in R^+ \times R^+\}$

$$V(x_j) = \max_{\mathcal{C}_j} \left\{ u(c_j) + \beta \overbrace{\times \pi_j \left(h\left(\epsilon^h\right)\right)}^{\text{Health surv. channel}} \times \mathbb{E}\left[V(x_{j+1}) \mid x_j\right] \right\} \text{ s.t.}$$

$$(1+\tau^c)\, c_j + a_{j+1} \overbrace{+ o_j \left(m_j\left(\epsilon^h\right)\right)}^{\text{Health spending channel}} + \text{prem}^{\text{MCare}}$$

$$= (1+r)\, a_j + b_j^{\text{SS}} + b_j^{\text{SI}} + \left(1-\tau^{\text{Beq}}\right) b^{\text{Beq}} \overbrace{- T^y\left(y_j^{\text{T}}\right)}^{\text{Health tax channel}}$$

More Details

Remaining Parts

- Insurance companies GHI and IHI clear zero profit condition Details
- Government budget constraint clears Details
- Pension program financed via payroll tax Details
- Accidental bequests to surviving individuals Details
- Competitive Equilibrium Details

Mapping the model to data

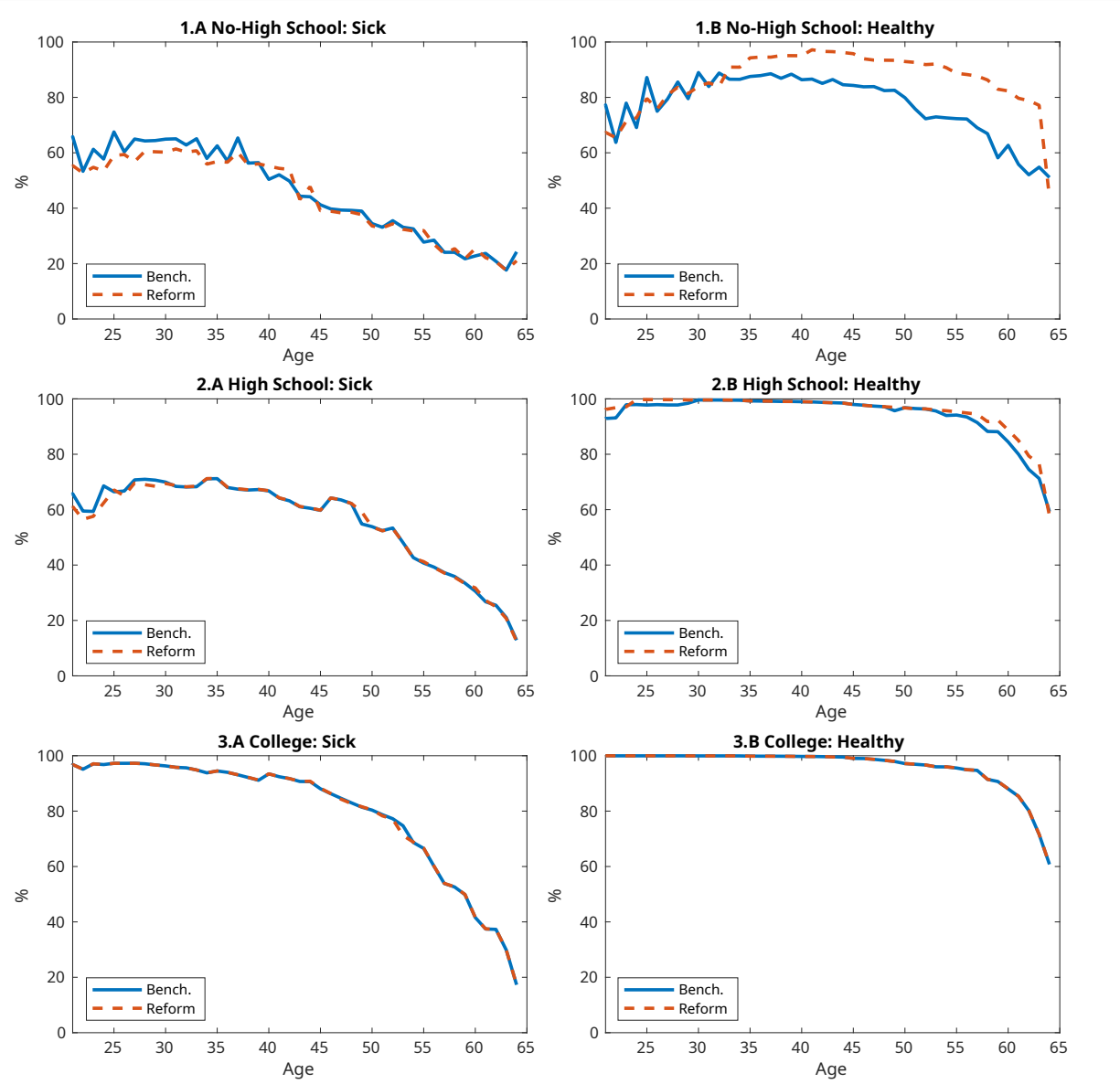
Parameterization and Calibration

- Goal: to match U.S. data pre-ACA (before 2010)
- Data sources:
  - MEPS: labor supply, health shocks, health expenditures, coinsurance rates
  - PSID: initial asset distribution
  - Previous studies: income process, labor shocks, aggregates

More Calibration Details
Exogenous Parameters
Calibrated Parameters
Targeted Moments

Quantitative Analysis

Reform 1: Work mandate for healthy (PE)
Labor participation

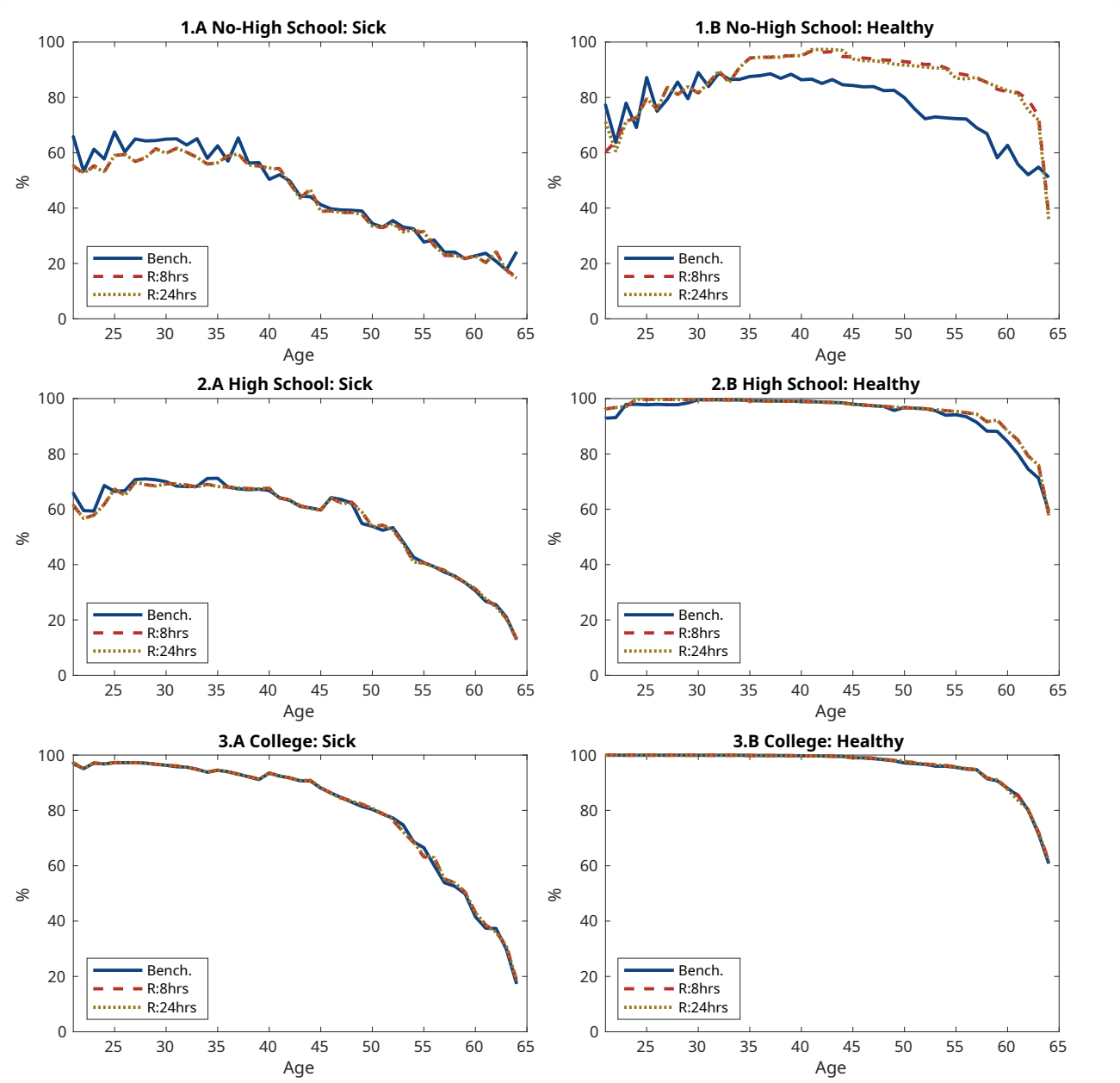


	Bench.	8Hrs	16Hrs	20Hrs	24Hrs
Assets	100.00	100.24	100.26	100.27	100.27
Consumption	100.00	100.56	100.57	100.57	100.57
Labor part. rate	72.99	74.29	74.27	74.26	74.26
Agg. work hours	100.00	101.40	101.46	101.46	101.46
Weekly hrs. workers	37.01	36.87	36.90	36.90	36.90
Insured-working age (%)	76.97	75.93	75.75	75.75	75.75
▪ IHI (%)	9.27	9.97	9.92	9.92	9.92
▪ GHI (%)	60.73	62.13	62.12	62.12	62.12
▪ Medicaid (%)	4.95	1.83	1.72	1.71	1.71
▪ DI-MCare (%)	2.02	2.00	1.99	1.99	1.99
Medicaid payments	100.00	71.18	68.41	68.35	68.35
Avge. Medicaid paym. ($1,000)	6.67	12.81	13.14	13.14	13.14
SI (c_{min}) transfers	100.00	119.01	124.32	124.55	124.55
Avge. SI transf. ($1,000)	4.63	4.19	4.33	4.33	4.33
SI recip.among wrk-age (%)	1.30	1.89	1.94	1.94	1.94
Medicaid/tax revenue (%)	2.03	1.44	1.38	1.38	1.38
Welfare all (%CEV)	0.00	-0.52	-0.53	-0.53	-0.53
▪ %CEV Low-inc sick	0.00	-2.74	-2.78	-2.82	-2.82
healthy	0.00	-2.38	-2.45	-2.47	-2.47
▪ %CEV Mid-inc sick	0.00	0.13	0.13	0.13	0.13
healthy	0.00	-0.14	-0.14	-0.14	-0.14
▪ %CEV High-inc sick	0.00	0.02	0.02	0.02	0.02
healthy	0.00	0.00	0.00	0.00	0.00

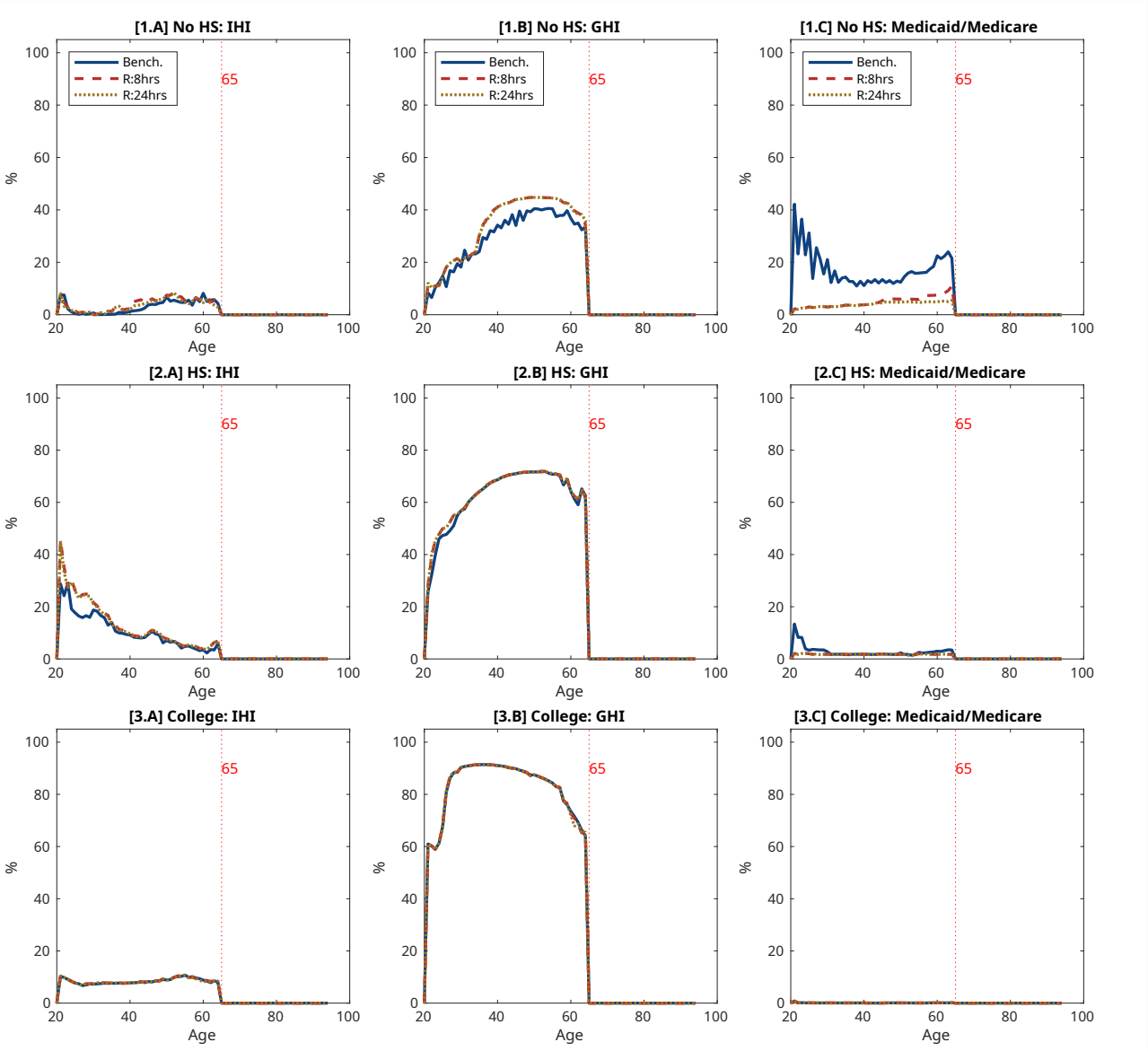
Reform 1: Work mandate for healthy (GenEqm)

	Bench.	8Hrs	16Hrs	20Hrs	24Hrs
Output	100.00	100.84	100.88	100.88	100.88
Capital	100.00	101.08	101.14	101.14	101.14
Consumption	100.00	100.99	101.03	101.03	101.03
Labor part. rate	72.99	74.19	74.17	74.17	74.17
Agg. work hours	100.00	101.24	101.31	101.31	101.31
Weekly hrs. workers	37.01	36.86	36.90	36.90	36.90
Wages	100.00	100.14	100.14	100.14	100.14
Avge IHI premium	100.00	94.36	94.49	94.50	94.50
Avge GHI premium	100.00	99.96	99.98	99.97	99.97
Insured-working age (%)	76.97	77.05	76.72	76.69	76.69
▪ IHI (%)	9.27	11.16	10.98	10.94	10.94
▪ GHI (%)	60.73	62.03	62.02	62.03	62.03
▪ Medicaid (%)	4.95	1.85	1.72	1.72	1.72
▪ DI-MCare (%)	2.02	2.01	2.00	2.00	2.00
Medicaid payments	100.00	72.41	69.40	69.35	69.35
Avge.Medicaid paym. ($1,000)	6.67	12.80	13.18	13.19	13.19
SI (c_{min}) transfers	100.00	120.05	125.79	126.06	126.06
Avge. SI transf. ($1,000)	4.63	4.13	4.31	4.32	4.32
SI recip.among wrk-age (%)	1.30	1.93	1.97	1.97	1.97
Income tax revenue	100.00	98.88	98.82	98.82	98.82
SI/tax revenue (%)	0.55	0.66	0.69	0.69	0.69
Medicaid/tax revenue (%)	2.03	1.48	1.41	1.41	1.41
Welfare all (%CEV)	0.00	0.10	0.12	0.12	0.12
▪ %CEV Low-inc sick	0.00	-1.89	-1.91	-1.91	-1.91
healthy	0.00	-1.47	-1.51	-1.51	-1.51
▪ %CEV Mid-inc sick	0.00	0.66	0.69	0.69	0.69
healthy	0.00	0.44	0.47	0.47	0.47
▪ %CEV High-inc sick	0.00	0.56	0.58	0.58	0.58
healthy	0.00	0.50	0.54	0.54	0.54

Reform 1: Labor participation (GE)



Reform 1: Insurance Take-up (GE)



Reform 2: Work mandate for healthy+sick (GE)

	Bench.	8Hrs	16Hrs	20Hrs	24Hrs
Output	100.00	101.87	101.92	101.92	101.92
Capital	100.00	102.70	102.79	102.78	102.78
Consumption	100.00	102.05	102.09	102.08	102.08
Labor part. rate	72.99	75.15	74.99	74.98	74.98
Agg. work hours	100.00	102.30	102.34	102.32	102.32
Weekly hrs. workers	37.01	36.77	36.86	36.86	36.86
Wages	100.00	100.46	100.48	100.48	100.48
Avge IHI premium	100.00	105.32	104.34	104.38	104.38
Avge GHI premium	100.00	102.72	102.86	102.85	102.85
Insured-working age (%)	76.97	77.07	75.86	75.83	75.83
▪ IHI (%)	9.27	12.62	11.83	11.82	11.82
▪ GHI (%)	60.73	62.09	62.10	62.10	62.10
▪ Medicaid (%)	4.95	0.37	0.01	0.00	0.00
▪ DI-MCare (%)	2.02	1.98	1.92	1.91	1.91
Medicaid payments	100.00	14.03	0.40	0.00	0.00
Avge. Medicaid paym. ($1,000)	6.67	12.20	10.66	4.11	
SI (c_{min}) transfers	100.00	207.71	257.88	260.72	260.72
Avge. SI transf. ($1,000)	4.63	6.81	7.81	7.85	7.85
SI recip.among wrk-age (%)	1.30	2.27	2.52	2.54	2.54
Income tax revenue	100.00	97.31	97.20	97.21	97.21
SI/tax revenue (%)	0.55	1.15	1.43	1.44	1.44
Medicaid/tax revenue (%)	2.03	0.29	0.01	0.00	0.00
Welfare all (%CEV)	0.00	0.72	0.73	0.73	0.73
▪ %CEV Low-inc sick	0.00	-1.25	-1.32	-1.36	-1.36
healthy	0.00	-0.78	-0.85	-0.88	-0.88
▪ %CEV Mid-inc sick	0.00	1.04	1.08	1.08	1.08
healthy	0.00	1.03	1.06	1.05	1.05
▪ %CEV High-inc sick	0.00	1.00	1.06	1.05	1.05
healthy	0.00	1.16	1.20	1.20	1.20

Reform 3: Work for healthy+ sick + DI (GE)

	Bench.	8Hrs	16Hrs	20Hrs	24Hrs
Output Y	100.00	101.88	101.85	101.84	101.84
Capital K	100.00	102.70	102.68	102.66	102.66
Consumption C	100.00	102.05	102.00	101.99	101.99
Labor Part. Rate	73.77	75.94	75.66	75.64	75.64
Weekly Hrs Workers	37.04	36.78	36.89	36.89	36.89
K/Y	2.84	2.87	2.87	2.87	2.87
M/Y (%)	16.00	16.00	16.00	16.00	16.00
Interest r (%)	100.00	98.42	98.42	98.42	98.42
Wages w	100.00	100.47	100.47	100.47	100.47
Wages w w/ GHI off.	100.00	100.31	100.32	100.32	100.32
Avge IHI Premium	100.00	116.91	117.47	117.43	117.43
Avge GHI Premium	100.00	102.88	102.69	102.66	102.66
Insured-Worker(%)	70.07	65.98	65.31	65.29	65.29
▪ IHI (%)	4.00	3.87	3.58	3.59	3.59
▪ GHI (%)	60.48	61.73	61.72	61.70	61.70
▪ Medicaid (%)	5.60	0.38	0.01	0.00	0.00
Medicaid Payments	100.00	11.62	0.22	0.00	0.00
IHI-Subsidy					
Tax Revenue	100.00	99.35	99.42	99.43	99.43
▪ Income Tax Revenue	100.00	96.69	96.84	96.88	96.88
Gini: Wealth	0.53	0.53	0.53	0.53	0.53
Gini: OOP Med. Spend.	0.55	0.55	0.55	0.55	0.55
Welfare All (%CEV)	0.00	-0.22	-0.37	-0.38	-0.38
▪ %CEV Low-Inc Sick	0.00	-3.13	-3.45	-3.55	-3.55
Healthy	0.00	-2.63	-3.16	-3.19	-3.19
▪ %CEV Mid-Inc Sick	0.00	-0.43	-0.51	-0.50	-0.50
Healthy	0.00	-0.04	-0.13	-0.14	-0.14
▪ %CEV High-Inc Sick	0.00	0.85	0.81	0.80	0.80
Healthy	0.00	1.13	1.10	1.09	1.09

ACA - Reforms

- Work requirements for healthy under ACA: Reform 1 w/ ACA
- Work requirements for healthy + sick under ACA: Reform 2 w/ ACA
- Work requirements for healthy + sick + DI under ACA: Reform 3 w/ ACA

Conclusion

Conclusion

- Study dynamic effects of work requirements to maintain Medicaid eligibility

- Overlapping generations model with health risk and labor and health insurance decisions
  - Model tracks private and public health insurance
  - Model accounts for most important features of the ACA

- Work requirements
  - Moderate increase in employment (via extensive margin)
  - Boost output and aggregate consumption
  - Can result in **overall welfare** losses if reforms are **too aggressive** (incl. DI)
- **Low income/sick** individuals always experience welfare losses (trickle down from GE growth, does not trickle enough!)

Thank you!

Supplementary material

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Model Details

Firms offering GHI

- Firms offering GHI subsidizes fraction ψ of premium cost
- Firm passes costs c_E to employees e.g. Jeske and Kitao (2009)

$$\widehat{w} = \left(w - 1_{[\epsilon^{\text{GHI}}=1]} \times c_E \right)$$

with

$$c_E = \frac{\psi \times \sum_{j=1}^{J_R-1} \mu_j \int \left(1_{[\text{in}_{j+1}(x_j)=2]} \times \text{prem}_j^{\text{GHI}} \right) d\Lambda(x_j)}{\sum_{j=1}^{J_R-1} \mu_j \int \left(1_{\left[\varepsilon_j^{\text{GHI}}=1\right]} \times e_j(\vartheta, \epsilon^n, \epsilon^h, \epsilon^{\text{di}}) \times n_j \right) d\Lambda(x_j)}$$

- Remaining share of GHI premium $\widehat{\text{prem}}^{\text{GHI}} = (1-\psi) \times \text{prem}^{\text{GHI}}$ is tax deductible

Back to Firms

Worker's Dynamic Optimization Problem I

- State vector: $x_j = \left\{ \vartheta, a_j, \text{in}_j, \epsilon_j^n, \epsilon^h, \epsilon_j^{\text{GHI}}, \epsilon^{\text{di}} \right\}$
- Choice set: $\mathcal{C}_j \equiv \{(c_j, \ell_j, a_{j+1}, \text{in}_{j+1}) \in R^+ \times [0,1] \times R^+ \times \{0,1,2,3,4\}\}$

$$V(x_j) = \max_{\{c_j, \ell_j, a_{j+1}, \text{in}_{j+1}\}} \left\{ u(c_j, \ell_j) + \beta \times \pi_j \left(\epsilon^h\right) \times \mathbb{E}\left[V(x_{j+1}) \mid x_j\right] \right\} \text{ s.t.}$$

$$(1+\tau^c) c_j + a_{j+1} + o_j(m_j)$$

$$+1_{\{\text{in}_{j+1}=1\}} \text{prem}^{\text{IHI}}\left(j, \epsilon^h\right) + 1_{\{\text{in}_{j+1}=2\}} \widehat{\text{prem}}_j^{\text{GHI}} + 1_{\{\text{in}_{j+1}=4\}} \text{prem}_j^{\text{MCare}}$$

$$= (1+r) a_j + y_j^n + 1_{\{\epsilon^{\text{di}}=1\}} b_{j,\vartheta}^{\text{DI}} + b_j^{\text{SI}} + \left(1 - \tau^{\text{Beq}}\right) b^{\text{Beq}} - \text{Tax},$$

$$c \geq \underline{c}, \; a_j \geq 0,$$

Worker's Dynamic Optimization Problem II

- Taxable income

$$
\begin{aligned}
y_j^n &= \overbrace{\widehat{w} \times e_j\left(\vartheta, \epsilon_j^n, \epsilon^h, \epsilon^{\text{di}}\right)}^{\text{Health-dependent income}} \times (1-\ell_j), \\
y_j^{\text{T}} &= y_j^n + 1_{\{\epsilon^{\text{di}}=1\}} b_\vartheta^{\text{DI}} + r \times a_j - 1_{\{\text{in}_{j+1}=2\}} \widehat{\text{prem}}_j^{\text{GHI}} \\
&\quad - \max\left[0,\, o\left(m_j\right) - 0.075 \times \left(y_j^n + 1_{\{\epsilon^{\text{di}}=1\}} b_{j,\vartheta}^{\text{DI}} + r \times a_j\right)\right], \\
y_j^{\text{SS}} &= y_j^n - 1_{\{\text{in}_{j+1}=2\}} \text{prem}_j^{\text{GHI}} - 1_{\{\text{in}_{j+1}=4\}} \text{prem}^{\text{MCare}},
\end{aligned}
$$

- Taxes

$$
\begin{aligned}
\text{Tax} &= T^y\left(y_j^{\text{T}}\right) + T^{\text{SS}}\left(y_j^{\text{SS}}; \bar{y}^{\text{SS}}\right) + T^{\text{MCare}}\left(y_j^{\text{SS}}\right) \\
T^{ss}\left(y_j^{\text{SS}}; \bar{y}^{\text{SS}}\right) &= \tau^{\text{SS}} \times \min\left[y_j^{\text{SS}}; \bar{y}^{\text{SS}}\right] \\
T^{\text{MCare}}\left(y_j^{\text{SS}}\right) &= \tau^{\text{MCare}} \times y_j^{ss}
\end{aligned}
$$

Worker's Dynamic Optimization Problem III

- Transfers

$$b_j^{\mathsf{SI}} = \max\left[0,\ \underline{c} + o\left(m_j\right) - y_j^{\mathsf{AT}} - a_j - b^{\mathsf{Beq}}\right]$$
$$y_j^{\mathsf{AT}} = y_j^n + 1_{\left\{\epsilon^{\mathsf{di}}=1\right\}} b_{j,\vartheta}^{\mathsf{DI}} + r \times a_j - \mathsf{Tax}$$

- Average past labor earnings by income group ϑ

$$\bar{y}^{\vartheta} = \int_{j \leq J_W} y_j^n\left(\boldsymbol{x}\left(\vartheta\right)\right) d\Lambda\left(\boldsymbol{x}\left(\vartheta\right)\right)$$

Back to Worker Problem

Retiree's Dynamic Optimization Problem

- State vector: $x_j = \left\{\vartheta, a_j, \epsilon^h\right\}$

$$V\left(x_j\right) = \max_{\left\{c_j, a_{j+1}\right\}} \left\{u\left(c_j\right) + \beta \times \pi_j\left(\epsilon^h\right) \times \mathbb{E}\left[V\left(x_{j+1}\right) \mid x_j\right]\right\} \text{ s.t.}$$

$$\left(1+\tau^c\right) c_j + a_{j+1} + o_j\left(m_j\right) + \text{prem}^{\text{MCare}}$$

$$= \left(1+r\right) a_j + b_j^{\text{SS}} + b_j^{\text{SI}} + \left(1-\tau^{\text{Beq}}\right) b^{\text{Beq}} - T^y\left(y_j^{\text{T}}\right)$$

$$c_j \geq \underline{c}$$
$$a_j \geq 0$$

- Taxable income

$$y_j^{\text{T}} = r \times a_j + b_j^{\text{SS}} - \max\left[0,\ \left(o_j\left(m_j\right) + 1_{[j>J_W]}\text{prem}^{\text{MCare}}\right) - 0.075 \times \left(r \times a_j + b_j^{\text{SS}}\right)\right]$$

- Social insurance transfers

$$b_j^{\text{SI}} = \max\left[0,\ \underline{c} + o_j\left(m_j\right) + \text{prem}^{\text{MCare}} + T^y\left(y_j^{\text{T}}\right) - \left(1+r\right) a_j - b_j^{\text{SS}} - b^{\text{Beq}}\right]$$

Back to Retired Problem

Insurance Sector

- Individual HI

$$\text{prem}^{\text{IHI}}_{j,\epsilon^h} = \frac{\left(1+\omega^{\text{IHI}}\right)\mu_{j+1}\int\left[\underset{\left[\text{in}_j(x)=1\right]}{1\times}\left(1-\gamma^{\text{IHI}}\right)m_{j+1}(x)\Pr\left(\epsilon^h_{j+1}|\epsilon^h_j,j,\vartheta,1_{\text{in}_j>0}\right)\right]d\Lambda\left(x_{j+1,}\right.}{R\times\mu_j\int\left(1_{\left[\text{in}_{j,h}(x)=1\right]}\right)d\Lambda\left(x_{j,-\epsilon^h}\right)}$$

- Employer provided group HI

$$\left(1+\omega^{\text{GHI}}\right)\sum_{j=2}^{J_1}\mu_j\int\left[\underset{\left[\text{in}_j(x)=2\right]}{1\times}\left(1-\gamma^{\text{GHI}}\right)m_j(x)\right]d\Lambda(x)$$

$$= \quad R\sum_{j=1}^{J_1-1}\mu_j\int\left(1_{\left[\text{in}_j(x)=2\right]}\text{prem}^{\text{GHI}}_j\right)d\Lambda(x),$$

Back to Remaining Parts

Government Budget

- Gov't BC:

$$C_G + \overbrace{\int \left[1_{[\text{MAid}]}\gamma^{\text{MAid}} \times m_j(\boldsymbol{x})\right] d\Lambda(\boldsymbol{x})}^{\text{Medicaid Payments}} + \overbrace{\int b^{\text{SI}}(\boldsymbol{x})\, d\Lambda(\boldsymbol{x})}^{\text{Social Transfers}} + \overbrace{\int b^{\text{DI}}(\boldsymbol{x})\, d\Lambda(\boldsymbol{x})}^{\text{DisabilityPayments}}$$

$$= \int \left[\tau^c \times c(\boldsymbol{x}) + T^y\left(y^{\text{T}}(\boldsymbol{x})\right)\right] d\Lambda(\boldsymbol{x}) + \tau^{\text{Beq}} B^{\text{Beq}} + \text{surplus}^{\text{SS}} + \text{surplus}^{\text{MCare}}$$

- Pensions

$$\text{surplus}^{\text{SS}} = \int T^{\text{SS}}\left(y_j^{\text{SS}}(\boldsymbol{x});\, \bar{y}^{\text{SS}}\right) d\Lambda(\boldsymbol{x}) - \int_{j>J_W} b^{\text{SS}}\left(\bar{y}_\vartheta\right) d\Lambda(\boldsymbol{x})$$

- Medicare

$$\text{surplus}^{\text{MCare}} = \int \left[T^{\text{MCare}}\left(y_j^{\text{SS}}(\boldsymbol{x})\right) + 1_{[j\leq J_W \wedge \epsilon^{\text{di}}=1]}\text{prem}^{\text{MCare}} + 1_{[j>J_W]}\text{prem}^{\text{MCare}}\right]$$
$$- \int_{j\leq J_W \wedge \text{in}=4} \left[\gamma^{\text{MCare}} \times m_j(\boldsymbol{x})\right] d\Lambda(\boldsymbol{x}) - \int_{j>J_W} \left[\gamma^{\text{MCare}} \times m_j(\boldsymbol{x})\right] d\Lambda(\boldsymbol{x})$$

Back to Remaining Parts

Bequests

- Accidental Bequests (per capita)

$$B^{\text{Beq}} = b^{\text{Beq}} \quad = \quad \sum_{j=1}^{J} \tilde{\mu}_j \int a_j \left(x_j\right) d\Lambda \left(x_j\right)$$

Back to Remaining Parts

A Competitive Equilibrium I

$\left\{\Pi_j^n,\, \Pi_{j,\vartheta,ins}^h,\, \Pi_{j,\vartheta}^{\text{GHI}},\, \Pi_{j,\vartheta,\epsilon^h,ins}^{\text{di}}\right\}_{j=1}^{J}$ for $\vartheta \in \{1,2,3\}$, $\epsilon^h \in \{1,2,3,4,5\}$, $ins \in \{0,1\}$, the survival probabilities $\left\{\pi_{j,\epsilon^h}\right\}_{j=1}^{J}$ and the exogenous government policies exogenous government policies $\left\{T_j^y,\, b_j^{\text{SI}},\, b_j^{\text{SS}},\, b_j^{\text{DI}}\right\}_{j=1}^{J}$ and $\left\{\tau^c, \tau^{\text{SS}}, \tau^{\text{MCare}}, \text{prem}^{\text{MCare}}, \gamma^{\text{MCare}}, \gamma^{\text{MAid}}, C_G\right\}$, a competitive equilibrium is a collection of sequences of distributions $\Lambda(\boldsymbol{x})$ of individual household decisions $\left\{c(\boldsymbol{x}), \ell(\boldsymbol{x}), a(\boldsymbol{x}), \text{in}(\boldsymbol{x})\right\}$, aggregate stocks of physical capital and effective labor services $\{K, N\}$, factor prices $\{w, q, R\}$, and insurance premiums $\left\{\text{prem}^{\text{IHI}}\left(j, \epsilon^h\right), \text{prem}^{\text{GHI}}\right\}$ such that:

(a) $\left\{c(\boldsymbol{x}), \ell(\boldsymbol{x}), a(\boldsymbol{x}), in(\boldsymbol{x})\right\}$ solves the consumer problem,

A Competitive Equilibrium II

(b) the firm first order conditions hold

$$\begin{aligned} w &= \frac{\partial F(K,N)}{\partial N} \\ q &= \frac{\partial F(K,N)}{\partial K} \\ R &= 1+q-\delta = 1+r \end{aligned}$$

(c) markets clear

$$K = \int a(\boldsymbol{x}) + \text{Prem}^{\text{GHI}}(\boldsymbol{x}) + \text{Prem}^{\text{IHI}}(\boldsymbol{x})\, d\Lambda(\boldsymbol{x})$$

$$N = \int e(\boldsymbol{x})\,(1-\ell(\boldsymbol{x}))\, d\Lambda(\boldsymbol{x})$$

$$B^{\text{Beq}} = \sum_{j=1}^{J} \tilde{\mu}_j \int a_j(x_j)\, d\Lambda(x_j)$$

A Competitive Equilibrium III

(d) the aggregate resource constraint holds

$$C_G + \int \left(c\left(\boldsymbol{x}\right) + m\left(\boldsymbol{x}\right) + a\left(\boldsymbol{x}\right)\right) d\Lambda\left(\boldsymbol{x}\right) = Y + \left(1 - \delta\right) K$$

(e) the government programs clear
(f) the budget conditions of the insurance companies hold
(g) the distribution is stationary

$$\left(\mu_{j+1}, \Lambda\left(x_{j+1}\right)\right) = T_{\mu,\Lambda}\left(\mu_j, \Lambda\left(x_j\right)\right),$$

where $T_{\mu,\Lambda}$ is a one period transition operator on the measure distribution

$$\Lambda\left(\boldsymbol{x}'\right) = T_{\Lambda}\left(\Lambda\left(\boldsymbol{x}\right)\right).$$

Back to Remaining Parts

Calibration Details

Health and Disability States

- $\epsilon^h \in \{1, 2, 3, 4, 5\}$ and $\Pi^h\left(j, \vartheta, 1_{\text{in}_j>0}\right)$ from MEPS
- $\epsilon^{\text{di}} \in \{0, 1\}$ and $\Pi^{\text{di}}\left(j, \vartheta, h, 1_{\text{in}_j>0}\right)$ from MEPS

Human Capital Formation I

- Human capital:

$$e_j\left(\vartheta, \epsilon^n, \epsilon^h, \epsilon^{\text{di}}\right) = \begin{cases} \bar{\text{e}}\left(j, \vartheta, h\left(\epsilon^h\right), \epsilon^{\text{di}}\right) \times \epsilon_j^n & \text{if } \epsilon^{\text{di}} = 0 \\ \bar{\text{e}}\left(j, \vartheta, h\left(\epsilon^h\right), \epsilon^{\text{di}}\right) \times \epsilon_j^n \times \phi_\vartheta & \textit{if } \epsilon^{\text{di}} = 1 \end{cases}$$

- 1999–2009 MEPS data we distinguish between three permanent educational groups

$$\vartheta = \begin{cases} 1 & \text{if less than high school} \\ 2 & \text{if high school} \\ 3 & \text{if college graduate or higher} \end{cases}$$

- 5 health states but only 2 health statuses (only the latter determine survival prob. and effective wages)

$$h\left(\epsilon^h\right) = \begin{cases} \text{healthy} & \text{if } \epsilon^h \in \{\text{excellent, very good, good}\} \\ \text{sick} & \text{if } \epsilon^h \in \{\text{fair, poor}\} \end{cases}$$

Human Capital Formation II

- Following Rupert and Zanella (2015) and Casanova (2013) we estimate a selection model to remove the selection bias in wage offers
- The stochastic component is modeled as an auto-regressive process so that

$$\ln\left(\epsilon_j^n\right) = \rho \times \ln\left(\epsilon_{j-1}^n\right) + \epsilon$$

- Persistence parameter ρ and a white-noise disturbance $\epsilon \sim N\left(0, \sigma_\epsilon^2\right)$
- Use $\rho = 0.977$ and $\sigma_\epsilon^2 = 0.0141$ based on French (2005) who uses PSID data and controls for health

Parameterization: Production Function

- Final goods production:

$$F(K, N) = AK^{\alpha} N^{1-\alpha}$$

- Parameters from other studies
- $A = 1$

Calibration: Group Insurance Offers

- Offer shock: $\epsilon^{GHI} = \{0, 1\}$ where
  - 0 indicates no offer and
  - 1 indicates a group insurance offer
- MEPS variables OFFER31X, OFFER42X, and OFFER53X
- Probability of a GHI offer is highly correlated with income
- $\Pi^{h}_{j,\vartheta}$ with elements $\Pr\left(\epsilon^{\text{GHI}}_{j+1} | \epsilon^{\text{GHI}}_{j}, \vartheta\right)$
- ϑ indicates permanent income group

Calibration: Coinsurance Rates

- Coinsurance rates from MEPS
- Premiums clear insurance constraints
- Markup profits of GHI are zero
- Markup profits of IHI are calibrated to match IHI take up rate
- IHI profits used to cross-subsidize GHI

Calibration: Disability and Pension Payments

- Average labor income per skill type: $\bar{y}^{\vartheta}$
- Pension payments: $b^{\text{SS}}(\vartheta) = \Psi_{\vartheta}^{\text{SS}} \times \bar{y}^{\vartheta}$
  - $\Psi_{\vartheta}^{\text{SS}}$ is replacement rate that determines the size of pension payments
  - Total pension amount to 4.1 percent of GDP
- Disability payments: $b^{\text{DI}}(\vartheta) = \Psi_{\vartheta}^{\text{DI}} \times \bar{y}^{\vartheta}$
  - $\Psi_{\vartheta}^{\text{DI}}$ is replacement rate that determines size of DI payments
  - Total pension amount to 0.1 percent of GDP

Calibration: Public Health Insurance

- Premium for medicare at 2.11% of GDP (Jeske and Kitao, 2009)
- Coinsurance rates for Medicare and Medicaid from MEPS
- Calibrated: Medicaid eligibility FPL_{Maid} at 60% of FPL to match % on Medicaid
- Calibrated: Asset test for Medicaid to match Medicaid take-up profile

Calibration: Taxes

- Benabou (2002), Heathcote, Storesletten and Violante (2017) federal progressive income tax

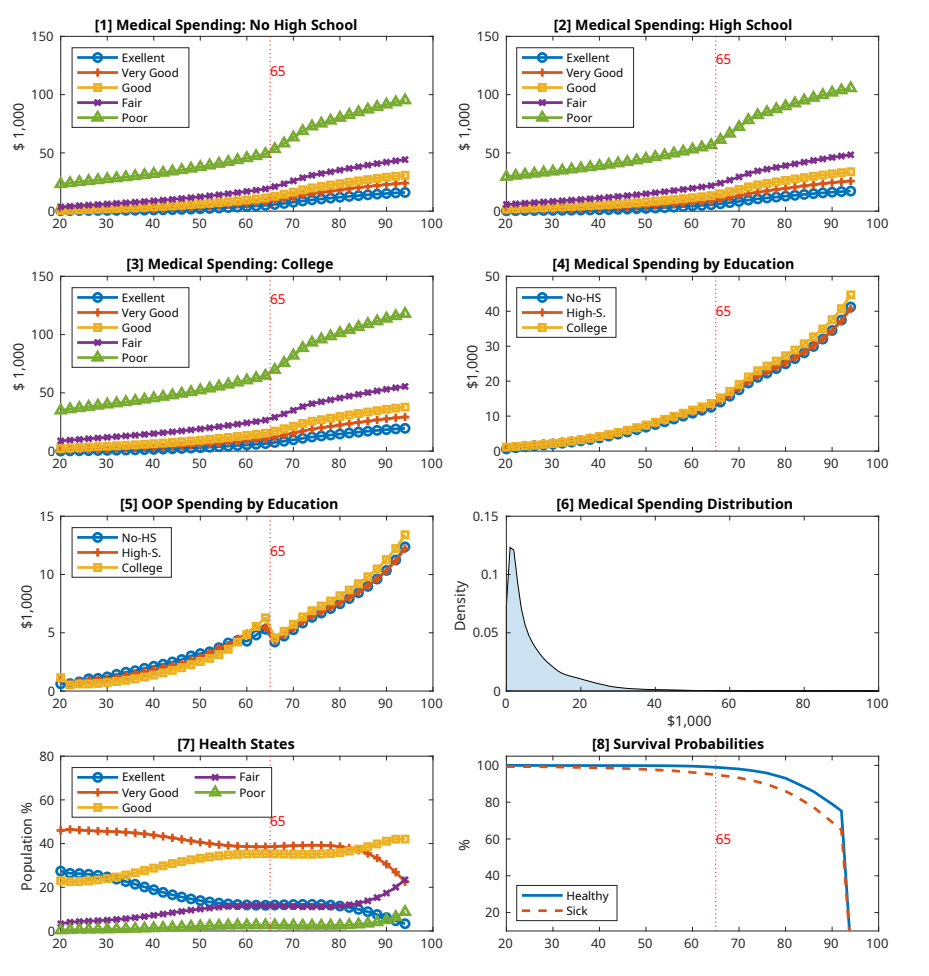
$$T^y(y) = \max\left[0,\, y - \tau_0^i \times y^{\left(1-\tau_1^i\right)}\right]$$

- Medicare tax is 2.9%
- Social security tax is 10.6%
- Consumption tax is 5%

Back to Calibration

External Parameters	Parameter vals	Sources
Periods J	15	
Periods work J_W	9	Age 20–64
Years modeled	75	Age 20–94
TFP A	1	Normalization
Capital share in prod. α	0.36	Koh, Santaeulàlia-Llopis and Zheng (2020)
Capital depreciation δ	6.4%	Koh, Santaeulàlia-Llopis and Zheng (2020)
Firm share of prem$^{\text{GHI}}$ ψ	0.8	Jeske and Kitao (2009)
Relative risk aversion σ	3	Standard values between $2.5 - 3.5$
Survival prob. $\pi_j\left(h\left(\epsilon^h\right)\right)$	Pan. 8, Fig.1	İmrohoroğlu and Kitao (2012)
Health Shocks ϵ_j^h	Pan.7, Fig.1	MEPS 1999–2009
Med. spend. shocks $m\left(j,\vartheta,\epsilon^h\right)$	Pan.1–3, Fig.1	MEPS 1999–2009
Health transition prob. $\Pi^h\left(j,\vartheta,1_{\text{in}_j>0}\right)$	Appendix	MEPS 1999–2009
Disability transition prob. $\Pi^{\text{di}}\left(j,\vartheta,h,1_{\text{in}_j>0}\right)$	Appendix	MEPS 1999–2009
GHI offer transition prob. $\Pi^{\text{GHI}}(j,\vartheta)$	Appendix	MEPS 1999–2009
Pers. labor shock auto-corr. ρ	0.977	French (2005)
Var. transitory labor shock $\sigma^2_{\epsilon_1}$	0.0141	French (2005)
Bias adj. wages $\bar{e}_j\left(\vartheta,h\left(\epsilon^h\right)\right)$	Appendix	MEPS 1999–2009
Private HI coins. γ^{IHI}	46%	MEPS 1999–2009
Private group HI coins. γ^{GHI}	31%	MEPS 1999–2009
Medicaid coins. γ^{MAid}	11%	MEPS 1999–2009
Medicare coins. γ^{MCare}	30%	MEPS 1999–2009
Medicare premiums/GDP	2.11%	Jeske and Kitao (2009)
Consumption tax τ^C	5%	IRS
Bequest Tax τ^{Beq}	20%	De Nardi and Yang (2014)
Payroll tax Soc. Sec. τ^{SS}	12.4%	SSA (2007)
Payroll tax Medicare τ^{MCare}	2.9%	SSA (2007)
Govt cons C_G/Y	15%	BEA 2009
Tax progressivity para. τ	0.053	Guner, Lopez-Daneri and Ventura (2016)

Exogenous variables



Back to Calibration

Calibrated Parameters

Parameters	Values	Calibration targets	Model gener. moments	Data	Sources
Discount factor β	0.995	$\frac{K}{Y}$	3	3	Standard value
Pop. adjust. rate n	0.01	Fraction of pop 65+	17.5%	17.5%	US Census 2010
Fixed time cost labor $\bar{n}_j(\vartheta, h)$	$[0.05, 0.17]$	Labor part.by age	Pan1,Fig.3		MEPS 1999–2009
Pref. cons. vs. leisure η	0.272	Avge. worker hours	Pan2,Fig.2		MEPS 1999–2009
GHI prem. scaling ϕ^{GHI}	0.75	GHI take-up at 25	Pan4,Fig.2		MEPS 1999–2009
Tax scaling para. λ	1.016	Clear govt.BC$\Rightarrow C_G/Y$	14%	15–17%	BEA 2009
Pension scaling $\Psi^{\text{SS}}_{\vartheta}$	$[0.32, 0.38]$	Size of Pension$/Y$	4.5%	4.8%	SSA (2010)
DI benefits scaling $\Psi^{\text{DI}} = 0.08$	$\Psi^{\text{DI}} = 0.08$	Size of SSI$/Y$	0.28%	0.31%	SSA (2009)
DI labor prod. scaler ϕ_{ϑ}	$\phi_{\vartheta} = []$	Labor part. ind. w/ DI	Fig. 3		MEPS 1999–2009
Medicaid asset test $\bar{a}^{\text{MAid}}$	$\$75,000$	40–64 on Medicaid	Pan6,Fig.2		MEPS 1999–2009
Medicaid inc. test $\bar{y}^{\text{MAid}}$	$\$5,500$	20–39 on Medicaid	Pan6,Fig.2		MEPS 1999–2009
Consumption floor $c_{\min}$	$\$2,500$	Frac. net-assets<\$5k	20%	20%	Jeske and Kitao (200

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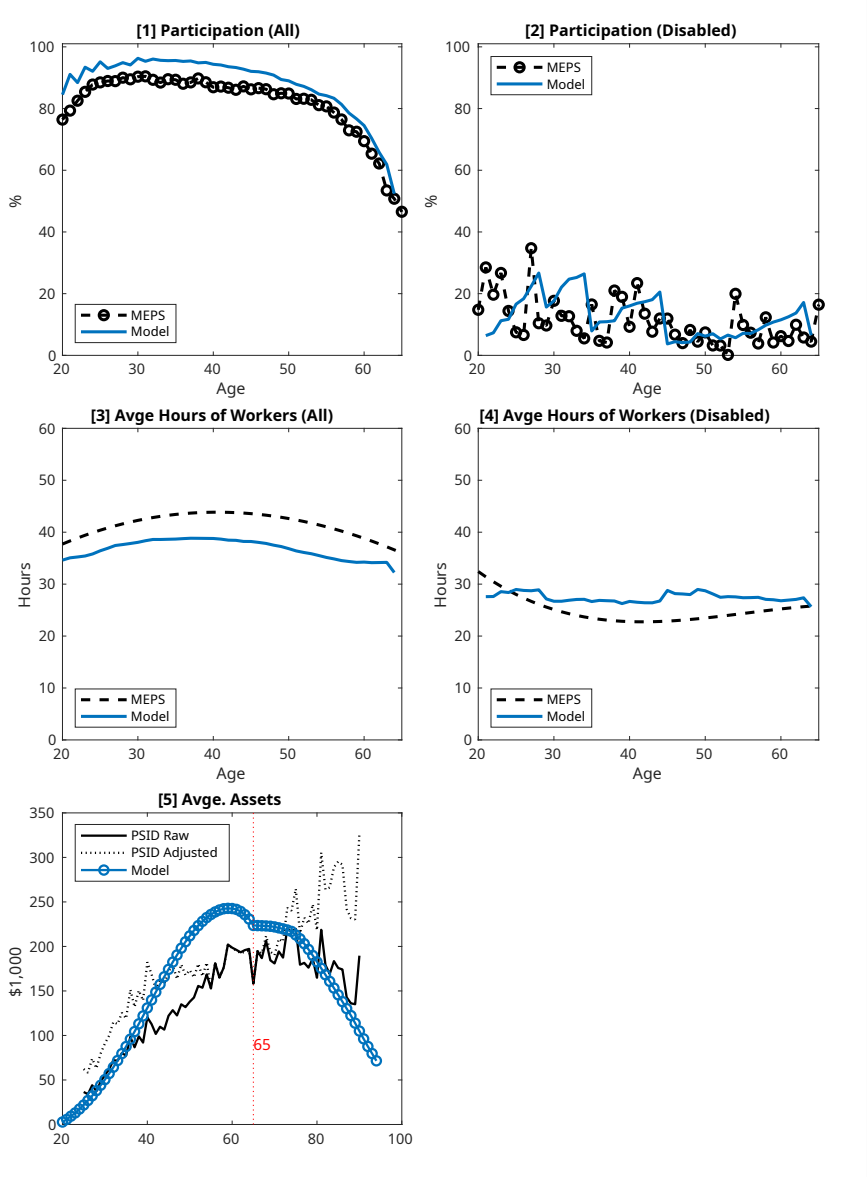
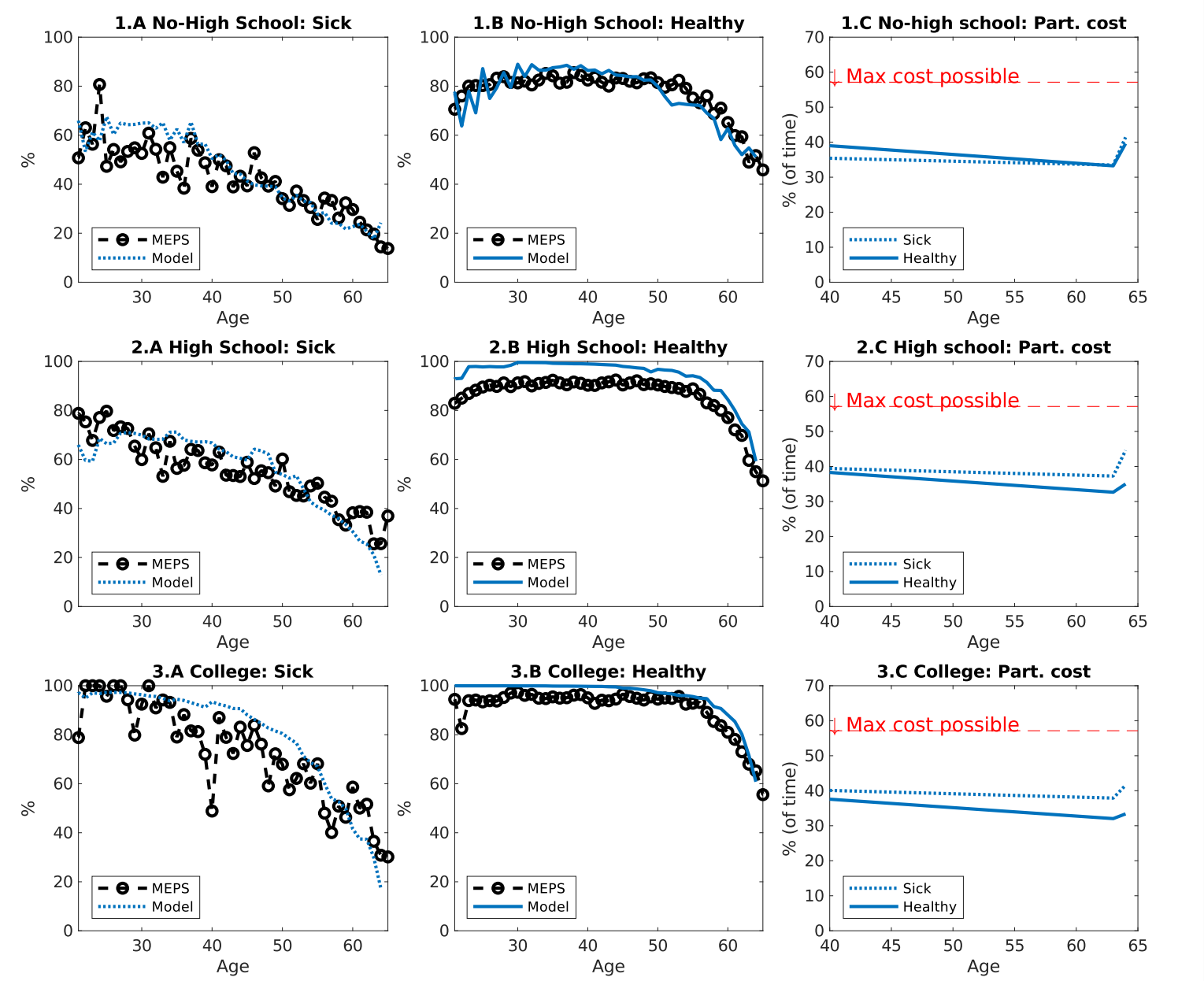
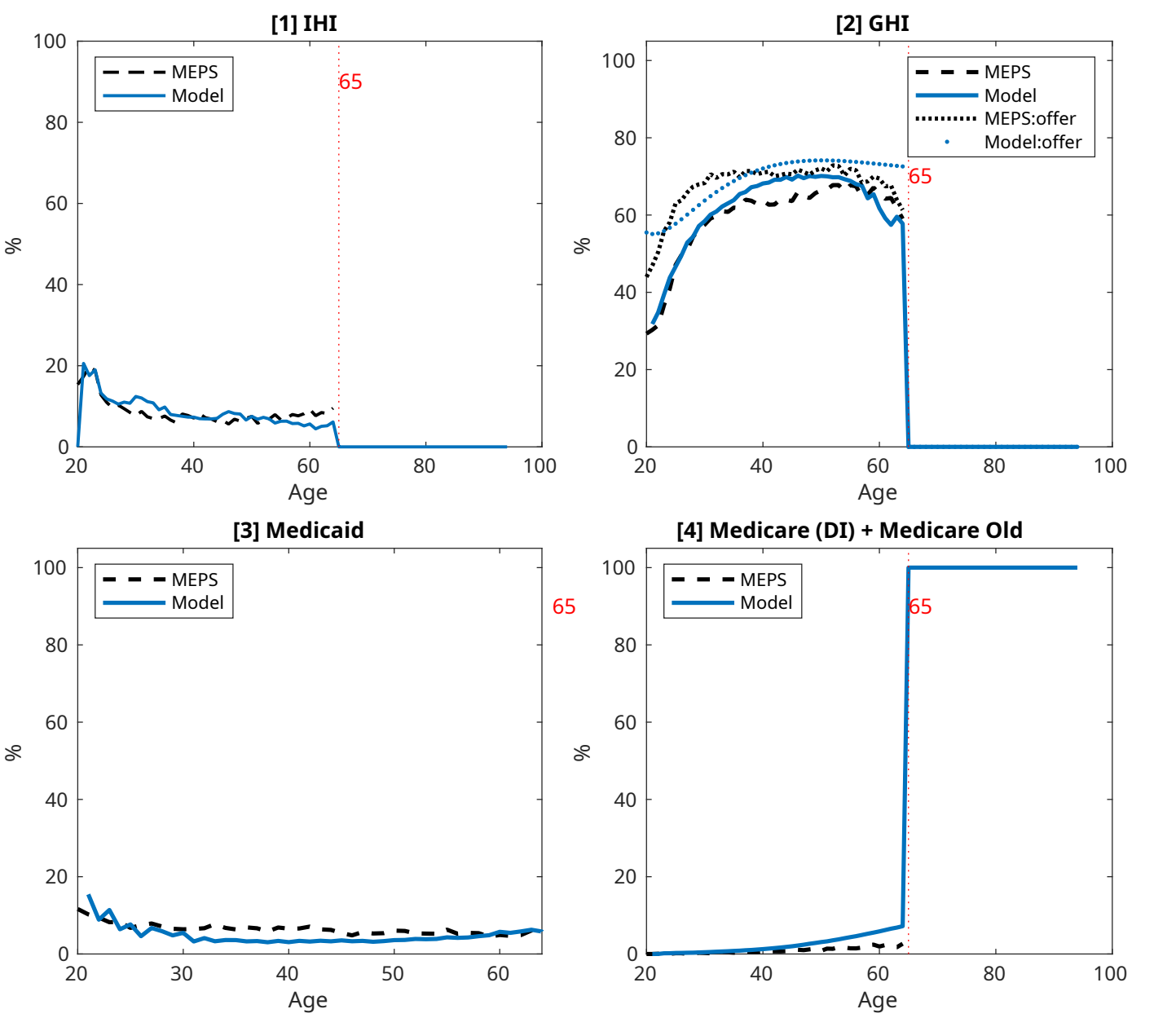
Targeted moments



Targets: Labor participation



Targets: HI take-up



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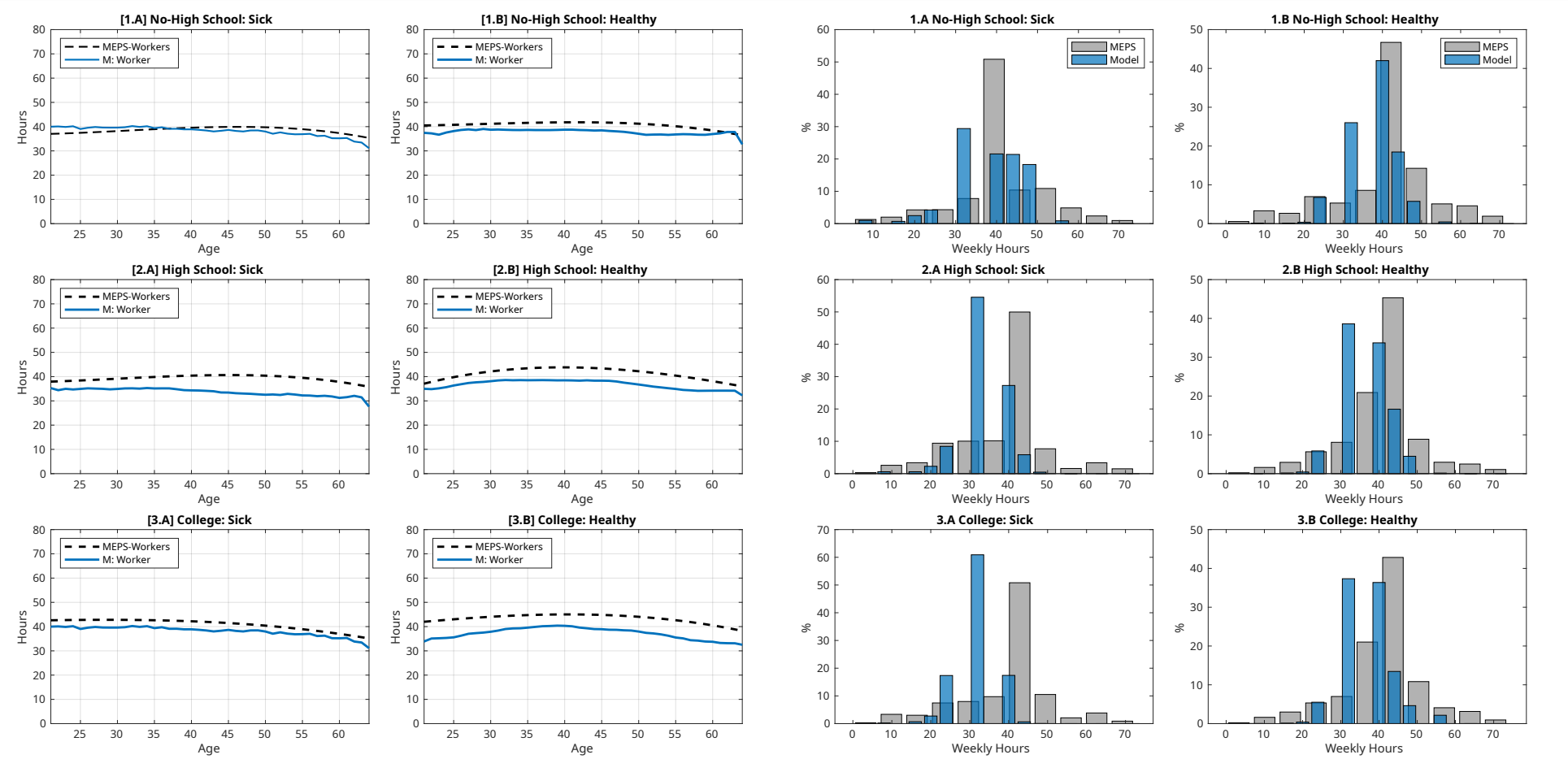
Model performance (not targets)



Model Performance (not targets)

Moments	Model	Data	Sources
Medical expenses/Y	15.9%	17.2%*	NHEA (2020*b*)
Gini medical spending	0.57	0.60	MEPS 1999–2009
Gini gross income	0.33	0.46	MEPS 1999–2009
Gini labor income	0.45	0.54	MEPS 1999–2009
Gini assets	0.54	0.69	PSID 1999–2009
Frisch labor supply elast.	1.19–1.51	1.1–1.7	Fiorito and Zanella (2012)
Interest rate: r	6.6%	$5.2 - 5.9\%$	Gomme et al. (2011)
Size of Medicare/Y	5.4%	$3.96\%\,(3.44\%)^{**}$	NHEA (2020*a*)
Size of Medicaid/Y	0.68%	$1.49\%\,(2.58\%)^{***}$	CMS-OAC (2010), NHEA (2020*a*)
Medicaid/enroll.(work-age)	$\$7,000$	$\$9,611$	CMS-OAC (2010)

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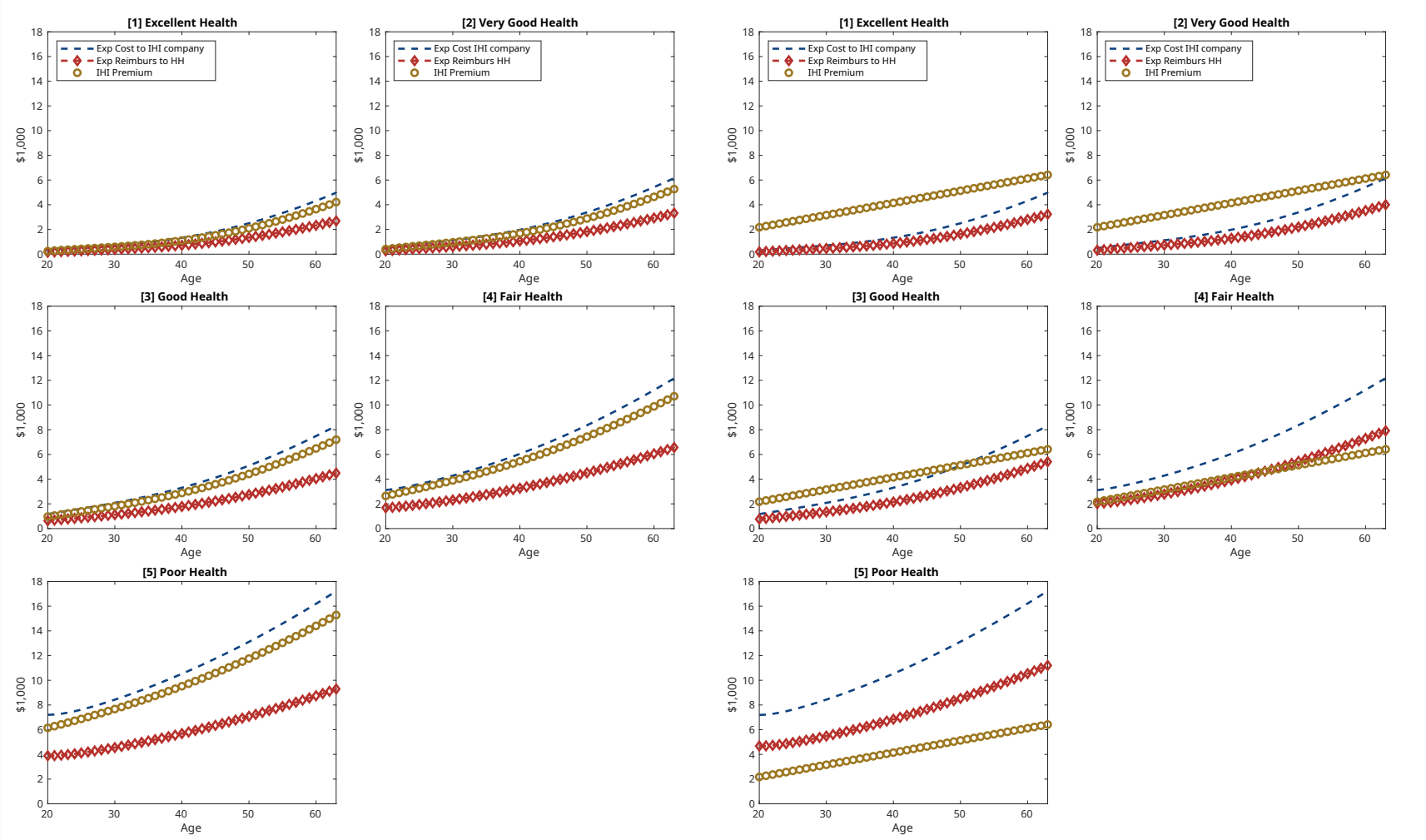
Reform 1 w/ ACA (PE)

	ACA-B.	ACA-8	ACA-16	ACA-20	ACA-24
Assets	100.00	99.69	99.74	99.70	99.70
Consumption	100.00	100.04	100.07	100.11	100.13
Labor part. rate	72.22	72.76	72.78	72.89	72.92
Agg. work hours	100.00	100.20	100.28	100.40	100.45
Weekly hrs. workers	36.56	36.36	36.38	36.36	36.37
IHI-subsidy	100.00	116.76	119.71	123.00	123.55
Insured-working age (%)	76.18	76.16	76.21	76.49	76.45
▪ IHI (%)	10.21	11.92	12.07	12.37	12.41
▪ GHI (%)	58.84	59.87	59.89	59.97	59.94
▪ Medicaid (%)	4.99	2.22	2.09	1.99	1.95
▪ DI-MCare (%)	2.15	2.15	2.15	2.15	2.15
Medicaid payments	100.00	80.82	77.52	75.75	75.17
Avge. Medicaid paym. ($1,000)	7.72	14.01	14.27	14.67	14.82
SI (c_{min}) transfers	100.00	116.18	116.23	116.33	116.34
Avge. SI transf. ($1,000)	6.85	5.74	5.74	5.72	5.72
SI recip.among wrk-age (%)	1.23	1.71	1.71	1.72	1.72
Income tax revenue	100.00	99.76	99.83	99.82	99.84
SI/tax revenue (%)	0.56	0.65	0.65	0.65	0.65
Medicaid/tax revenue (%)	2.28	1.84	1.76	1.72	1.71
Welfare all (%CEV)	0.00	-0.18	-0.21	-0.23	-0.24
▪ %CEV Low-inc sick	0.00	-0.86	-0.96	-1.12	-1.21
healthy	0.00	-0.82	-0.89	-0.94	-0.98
▪ %CEV Mid-inc sick	0.00	0.01	-0.03	-0.02	-0.02
healthy	0.00	-0.05	-0.08	-0.10	-0.10
▪ %CEV High-inc sick	0.00	-0.00	-0.00	-0.00	-0.00
healthy	0.00	0.01	0.01	0.01	0.01

Reform 1 w/ ACA: Mandate for healthy (GE)

	ACA-B.	ACA-8	ACA-16	ACA-20	ACA-24
Output	100.00	100.34	100.36	100.39	100.40
Capital	100.00	100.43	100.44	100.49	100.50
Consumption	100.00	100.41	100.44	100.48	100.49
Labor part. rate	72.22	72.87	72.90	72.97	72.98
Agg. work hours	100.00	100.44	100.49	100.56	100.58
Weekly hrs. workers	36.56	36.39	36.39	36.38	36.39
Wages	100.00	100.05	100.05	100.05	100.05
Avge IHI premium	100.00	91.16	91.24	90.67	90.66
IHI-subsidy	100.00	111.20	112.55	114.37	114.59
Avge GHI premium	100.00	99.72	99.77	99.68	99.75
Insured-working age (%)	76.18	76.66	76.66	76.97	76.98
▪ IHI (%)	10.21	12.59	12.66	12.95	12.97
▪ GHI (%)	58.84	59.90	59.88	59.96	59.97
▪ Medicaid (%)	4.99	2.01	1.97	1.89	1.87
▪ DI-MCare (%)	2.15	2.16	2.16	2.16	2.16
Medicaid payments	100.00	75.33	74.24	73.02	72.62
Avge. Medicaid paym. ($1,000)	7.72	14.35	14.48	14.80	14.87
SI (c_{min}) transfers	100.00	114.00	114.16	114.17	114.27
Avge. SI transf. ($1,000)	6.85	5.65	5.65	5.64	5.64
SI recip.among wrk-age (%)	1.23	1.71	1.71	1.72	1.72
Income tax revenue	100.00	99.40	99.39	99.38	99.39
SI/tax revenue (%)	0.56	0.63	0.64	0.64	0.64
Medicaid/tax revenue (%)	2.28	1.72	1.69	1.66	1.65
Welfare all (%CEV)	0.00	0.06	0.06	0.05	0.05
▪ %CEV Low-inc sick	0.00	-0.75	-0.77	-0.91	-0.90
healthy	0.00	-0.52	-0.53	-0.58	-0.60
▪ %CEV Mid-inc sick	0.00	0.27	0.26	0.26	0.27
healthy	0.00	0.14	0.14	0.14	0.14
▪ %CEV High-inc sick	0.00	0.29	0.30	0.32	0.32
healthy	0.00	0.30	0.30	0.31	0.31

IHI premiums pre-ACA vs post-ACA



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Reform 2 w/ ACA: Mandate for healthy+sick (GE)

	ACA-B.	ACA-8	ACA-16	ACA-20	ACA-24
Output	100.00	100.98	101.11	101.21	101.20
Capital	100.00	101.41	101.63	101.72	101.71
Consumption	100.00	101.12	101.24	101.37	101.37
Labor part. rate	72.22	73.83	73.78	73.94	73.88
Agg. work hours	100.00	101.11	101.27	101.48	101.46
Weekly hrs. workers	36.56	36.16	36.24	36.23	36.26
Wages	100.00	100.23	100.28	100.28	100.29
Avge IHI premium	100.00	92.92	94.83	94.15	94.35
IHI-subsidy	100.00	126.30	137.22	142.87	143.11
Avge GHI premium	100.00	102.55	103.21	103.25	103.21
Insured-working age (%)	76.18	76.21	76.22	76.48	76.34
▪ IHI (%)	10.21	13.52	14.07	14.63	14.61
▪ GHI (%)	58.84	59.74	59.65	59.61	59.62
▪ Medicaid (%)	4.99	0.82	0.40	0.13	0.00
▪ DI-MCare (%)	2.15	2.12	2.11	2.11	2.10
Medicaid payments	100.00	27.61	10.05	3.21	0.02
Avge. Medicaid paym. ($1,000)	7.72	12.77	9.56	9.73	16.84
SI (c_{min}) transfers	100.00	157.97	172.87	180.57	193.90
Avge. SI transf. ($1,000)	6.85	7.75	8.26	8.45	8.67
SI recip.among wrk-age (%)	1.23	1.75	1.80	1.84	1.94
Income tax revenue	100.00	98.22	97.96	97.84	97.84
SI/tax revenue (%)	0.56	0.88	0.97	1.01	1.08
Medicaid/tax revenue (%)	2.28	0.63	0.23	0.07	0.00
Welfare all (%CEV)	0.00	0.51	0.61	0.66	0.66
▪ %CEV Low-inc sick	0.00	-0.30	-0.11	-0.25	-0.24
healthy	0.00	0.02	0.09	0.10	0.09
▪ %CEV Mid-inc sick	0.00	0.54	0.61	0.70	0.70
healthy	0.00	0.57	0.69	0.75	0.75
▪ %CEV High-inc sick	0.00	0.43	0.50	0.55	0.59
healthy	0.00	0.75	0.84	0.90	0.91

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Reform 3 w/ ACA (GE)

	ACA-B.	8Hrs	16Hrs	20Hrs	24Hrs
Output Y	100.00	101.22	101.39	101.53	101.52
Capital K	100.00	101.90	102.18	102.30	102.30
Consumption C	100.00	101.29	101.44	101.66	101.64
Labor Part. Rate	73.83	75.66	75.56	75.79	75.66
Weekly Hrs Workers	36.82	36.37	36.48	36.49	36.53
K/Y	2.85	2.87	2.87	2.87	2.87
M/Y (%)	16.00	16.00	16.00	16.00	16.00
Interest r (%)	100.00	98.72	98.50	98.54	98.52
Wages w	100.00	100.38	100.45	100.43	100.44
Wages w w/ GHI off.	100.00	100.21	100.25	100.22	100.23
Avge IHI Premium	100.00	92.56	93.37	92.64	92.74
Avge GHI Premium	100.00	103.68	104.61	104.73	104.78
Insured-Worker(%)	72.84	72.04	71.85	72.26	71.87
▪ IHI (%)	7.28	10.10	10.55	11.02	10.91
▪ GHI (%)	59.88	60.88	60.75	61.06	60.96
▪ Medicaid (%)	5.67	1.06	0.54	0.18	0.00
Medicaid Payments	100.00	29.50	10.55	3.29	0.01
IHI-Subsidy	100.00	132.10	143.62	150.14	148.48
Tax Revenue	100.00	99.24	99.12	99.12	99.15
▪ Income Tax Revenue	100.00	97.32	96.93	96.77	96.84
Gini: Wealth	0.51	0.52	0.52	0.52	0.52
Gini: OOP Med. Spend.	0.53	0.53	0.54	0.54	0.54
Welfare All (%CEV)	0.00	-0.29	-0.29	-0.32	-0.39
▪ %CEV Low-Inc Sick	0.00	-1.84	-1.82	-2.22	-2.54
Healthy	0.00	-1.94	-2.03	-2.32	-2.68
▪ %CEV Mid-Inc Sick	0.00	-0.60	-0.63	-0.50	-0.52
Healthy	0.00	-0.23	-0.26	-0.24	-0.24
▪ %CEV High-Inc Sick	0.00	0.47	0.57	0.61	0.61
Healthy	0.00	0.77	0.88	0.94	0.93

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