Progressing into efficiency:

the role for labor tax progression in privatizing social security

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Motivation

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Social security is essentially about insurance:

- mortality (annuitized)

  Benartzi et al. 2011, Bruce & Turnovsky 2013, Reichling & Smetters 2015, Caliendo et al. 2017

- low income (redistribution)

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Prevailing consensus:

- redistribution is costly (distorts incentives)

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Bottom line: Shift insurance from retirement to working period → improve efficiency of social security → raise welfare.

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Theoretical model

(Stylized) theoretical model: partial equilibrium OLG model

Incomes:

- wage w_t grows at the constant rate γ, $z_t = (1+\gamma)^t$, interest rate r is constant
- two types $\theta \in \{\theta_H, \theta_L\}$, with productivities $\omega_\theta \in \{\omega_L, \omega_H\}$, and $\omega_H > \omega_L$

  denote $y(\theta) = (1-\tau) w_t \omega_\theta \ell_t(\theta)$ (and $\tilde{y}(\theta) = (1-\tau)\tilde{w}\omega_\theta \ell_t(\theta)$, $\tilde{w} = w_t/z_t$)

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Households:

- Live for 2 periods, population is constant,
- choose labor, consumption and assets

$$\begin{aligned} \text{first period:} \quad c_{1,t}(\theta) + a_{1,t+1}(\theta) &= (1-\tau) w_t \omega_\theta \ell_t(\theta) - z_t T(\tilde{y}(\theta)) \\ \text{second period:} \quad c_{2,t+1}(\theta) &= (1+r) a_{1,t+1}(\theta) + b_{2,t+1}(\theta) \end{aligned}$$

$T(y(\theta))$ is the progressive income tax and τ is social security contribution

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- GHH preferences: Frisch elasticity + risk aversion

$$
U(\theta) = \frac{1}{1-\sigma}\left(c_{1,t}(\theta) - \frac{\phi}{1+\eta} z_t \ell_{1,t}(\theta)^{1+\eta} + \beta c_{2,t+1}(\theta)\right)^{1-\sigma}
$$

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Government:

- needs to collect exogenously given level of revenue $\tilde{R} = R_t / z_t = constant$,
- with progressive income taxation:

$$T(\tilde{y}) = \tau_\ell \cdot \tilde{y} - \tilde{\mu}$$

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The implied government budget constraint is then

$$\tilde{R} = \sum_{\theta \in \{\theta_L, \theta_H\}} T(\tilde{y}_t(\theta)),$$

whatever funds are left are spent on lump-sum grants μ_t.

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Social security

Beveridge (full redistribution)

$$b^{BEV}_{2,t+1}(\theta) \quad = \quad \tau \quad w_{t+1} \quad \frac{1}{2} \quad \sum_{\theta \in \{L,H\}} \omega_\theta \ell_{1,t+1}(\theta).$$

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In stationary equilibrium:

$$\ell_1^{BIS}(\theta) > \ell_1^{BEV}(\theta)$$

$\rightarrow$ both types have efficiency gain, **what about redistribution**?
In BEV social security transfers from θ_H to θ_L are strictly positive.
They are zero in BIS.

Basic intuitions

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2. % Δ in labor supply depends on η
   (the smaller η, the larger Δ)

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3. % Δ in gov'nt revenue depends on η (Frisch elasticity)

$$\frac{R^{BIS} - R^{BEV}}{R^{BEV}} \equiv \xi^{1/\eta} - 1$$

Key results

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3. $\exists \quad \underline{\eta} > 1$ such that reform is a Pareto-improvement.
4. $\exists \quad \overline{\eta} > \underline{\eta}$ such that $\forall\ 1 < \eta < \bar{\eta}$ reform reform raises social welfare function

$$W = \sum_{\theta \in \{\theta_L, \theta_H\}} U(\theta)$$

Quantitative model

Consumers

- **uncertain lifetimes:** live for 16 periods, with survival $\pi_j < 1$
- **uninsurable productivity risk** + endogenous labor supply
- CRRA utility function
- pay taxes (progressive on labor, linear on consumption and capital gains)
- contribute to social security, face natural borrowing constraint

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Firms and markets

- Cobb-Douglas production function, capital depreciates at rate *d*
- no annuity, financial markets with (risk free) interest rate

Government

- Finances government spending G_t, constant as a share of GDP,
- Balances pension system: $subsidy_t$
- Services debt: $r_t D_t$,
- Collects taxes on capital, consumption, labor
  (progressive given by Benabou form)

$$G_t + subsidy_t + r_t D_t \quad = \quad \tau_{k,t} r_t A_t + \tau_{c,t} C_t + Tax_{\ell,t} + \Delta D_t$$

where $\Delta D_t = D_t - D_{t-1}$

Policy experiment

Status quo: current US social security

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Alternative: fully individualized social security and lump-sum grants

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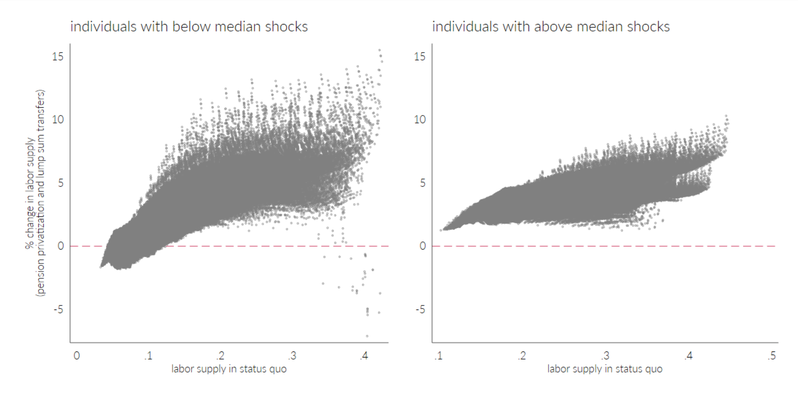
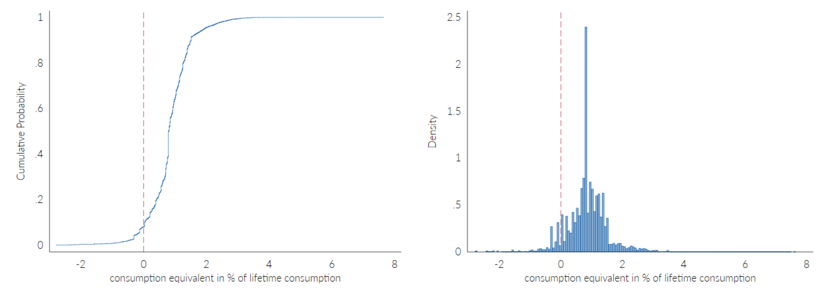
Results

Distortion for $\eta = 0.8$

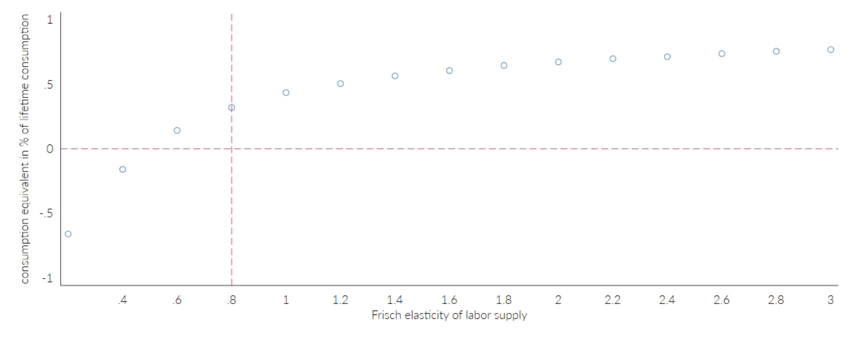
Labor supply reaction for $\eta = 0.8$



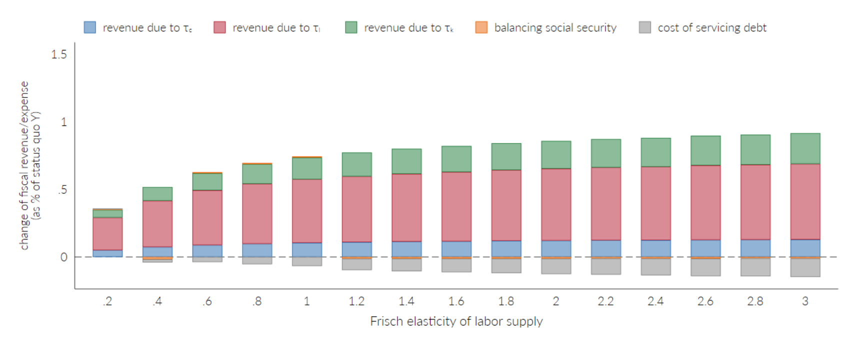
Distribution of welfare effects for $\eta = 0.8$



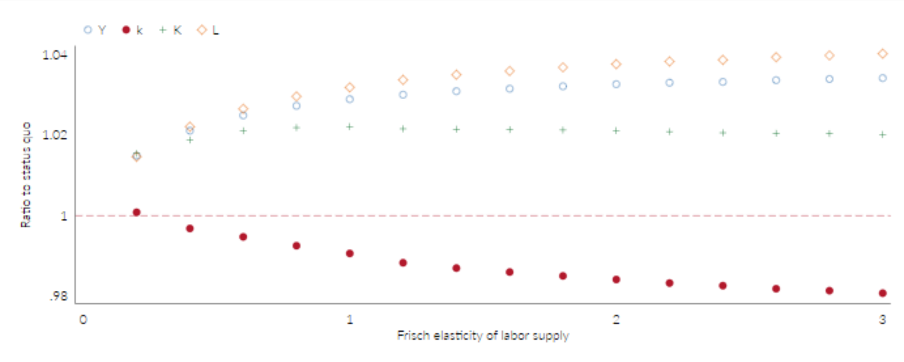
Welfare effect across η



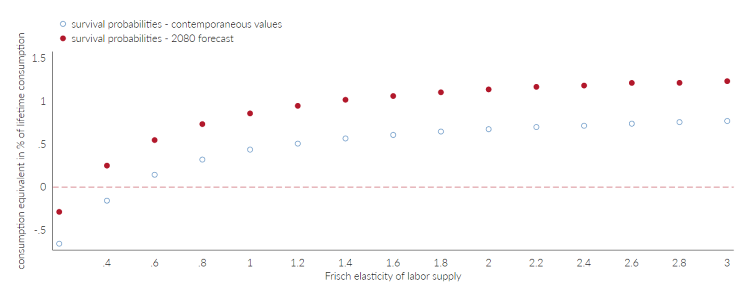
Fiscal adjustment across η



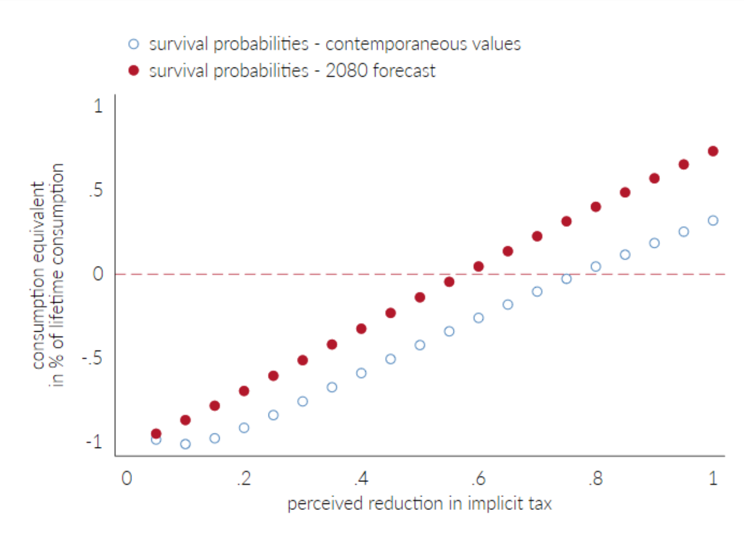
Macroeconomic adjustment across η



Longevity makes the reform beneficial for even less responsive labor markets



Half-internalizing the reform is sufficient to deliver welfare gains ($\eta = 0.8$)



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3. Important role for response of labor to the features of the pension system

Questions or suggestions?

Thank you!

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