Optimal Progressivity with Age-Dependent Taxes

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May 15, 2018

Goal: Determine optimal $\{\lambda_j, \tau_j\}$ where j indexes age

$$T_j(y) = y - \lambda_j y^{1-\tau_j}$$

$$y - T_j(y) = \lambda_j y^{1-\tau_j}$$

Two Main Findings:

1. Optimal $\tau_j > 0$ and U-shaped in Figure 4.
2. Welfare gains of moving from the optimal age-invariant to the optimal age-dependent tax system are small (i.e. $.15\%$).

Model and Method

1. Use GE model with labor-leisure choice and a one-time skill investment choice.
2. Current Model: roughly HSV (2017) but with age-dependent taxes and no financial assets
3. HSV (2017) is roughly Constantinides and Duffie (1996) permanent shock model but with labor choice and skill choice.

Current model (i) dispersion from initial conditions and period shocks, (ii) imperfect private insurance, (iii) matches US data and (iv) closed-form solutions.

What Forces Determine the U-shape Result?

Proposition 3 suggests U-shape arises because

1. rising wage rate dispersion via exogenous shocks is a force making τ_j rise with age.
2. average labor productivity rising with age is a force making τ_j decline with age.

Relation to Mirrleesian wedge literature?
(λ_j, τ_j) govern the wedge level. Figure 4 implies optimal ave. wedge increases in age and income.

Perspective on Main Findings

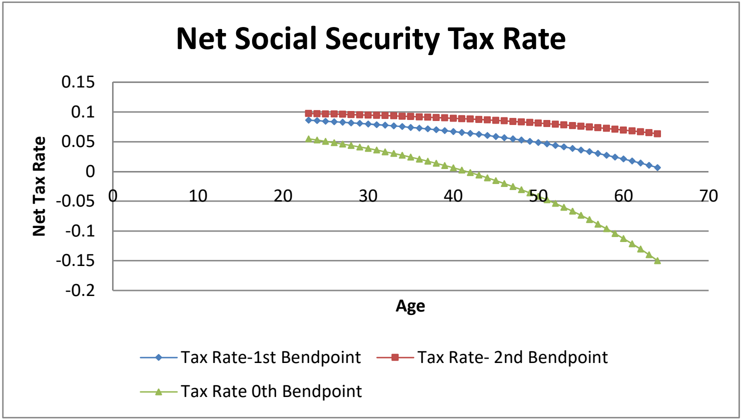
- Traditional issues (i) how much can current system be improved?, (ii) how to improve the current system? and (iii) main sources of welfare gains?
- Current paper does not address these issues but the companion paper HSV (2017) does.
- HSV (2017): current system can be improved by 0.65% by reducing τ from $\tau^{US} = .181$ to $\tau = .084$.
- HSV (2018): further gain of $.15\%$ to age dependent taxation with U-shaped τ_j.

Perspective on Age Dependence in US

Empirics: $\log y^{disp} = \alpha + \beta \log y \;\Rightarrow\; R^2 = .93$
Message: US has little age dependence.
Question: Does US social security induce some age dependence? Yes, a little.

1. $\tau_j = \tau_{SS} - \sum_{k>j} \frac{1}{(1+r)^{k-j}} \; MarginalBenefit_k$
2. $\tau_{SS} = .106$ OASI rate
3. $Benefit_k = f_k(average\ earnings)$
4. f_k is the social security benefit formula

Age dependence in current US system



Perspective on model earnings/wage process

Model: $\log y_j = \log p(s) + x_j + \alpha_j + \log h_j$
Empirical: $\log y_j = \log wage_j + \log h_j$

1. Empirical: HSV (2010) find most $Var(\log y)$ not due to $Var(\log h)$ and that most $\Delta_j Var(\log y_j)$ due to $\Delta_j Var(\log wage_j)$ and not $\Delta_j Var(\log h_j)$
2. HSV (2018) model endogenizes the fixed effect estimated in HSV (2010).
3. HSV (2018): most of model rise in $\Delta_j Var(\log y_j)$ is due to shocks $\Delta_j Var(\alpha_j)$. Choices play almost no role.

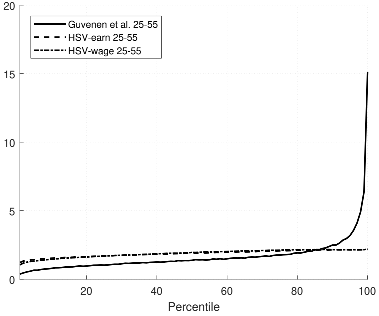
Perspective on model earnings/wage process

$\log y_j = \log p(s) + x_j + \alpha_j + \log h_j$ and $\alpha_j = \alpha_{j-1} + w_j$

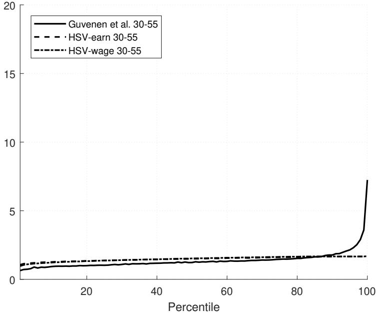
Question: Does the model match some non-targeted earnings moments that would help to make it a plausible model of top earners?

Answer: No.

(a) $Earnings_{55}/Earnings_{25}$



(b) $Earnings_{55}/Earnings_{30}$



SSA Data from Guvenen, Karahan, Ozkan and Song (2015)
HSV simulated model data on earnings and wage rates