Discussion of:
Krueger, Ludwig (2018)

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Laurence Ales
• Provides **sharp characterization** of optimal linear tax on capital

• Environment of interest: overlapping generations

• Why this environment?
  1. Lifecycle component: Income risk → taxes
  2. Multiple generations: Relative Pareto weights → taxes
  3. Log utility + Other: Simplify solution of Ramsey problem (Income risk)

• **Next:** Review formulas; To the data; Review of assumptions
A Simpler Example
• Consider 3 periods and 2 generations

• Let capital share $\alpha_0 \rightarrow \alpha_1 \rightarrow \alpha_2$

• Maintain log utility and Cobb-Douglas production.

1Generalized in Section 6 of the paper for general risk aversion and IES.
Changing Alpha: Theory (I/II)

- Consider 3 periods and 2 generations

- Let capital share $\alpha_0 \rightarrow \alpha_1 \rightarrow \alpha_2$

- Maintain log utility and Cobb-Douglas production. Then ($\approx$ Proposition 1):\(^1\)

$$s_0 = \frac{1}{1 + [\alpha_1 \beta (1 - \tau_1) \Gamma]^{-1}}$$

Income Risk \(\Gamma = \int [\kappa \eta_1 (1 - \alpha_1) + \alpha_1]^{-1} d\Psi(\eta_1)\)

- Observations:
  1. Proof: Euler equation \(\oplus\) Express consumption in terms of \(k_{t+1}\)
  2. As $\alpha_1$ increases income dispersion matters less

\(^1\)Generalized in Section 6 of the paper for general risk aversion and IES.
Changing Alpha: Theory (II/II)

- Let $\omega_0, \omega_1$ weights on first and second generation ($\theta = \omega_1/\omega_0$)

- Assume planner can choose saving rate $s$ only.
Changing Alpha: Theory (II/II)

• Let $\omega_0$, $\omega_1$ weights on first and second generation ($\theta = \omega_1/\omega_0$)

• Assume planner can choose saving rate $s$ only. Then ($\approx$ Proposition 2):

$$s_0^* = \frac{1}{1 + \left[\alpha_1 \beta + \frac{\omega_1}{\omega_0} \alpha_1 (1 + \alpha_2 \beta)\right]^{-1}}; \quad s_1^* = \frac{1}{1 + [\alpha_2 \beta]^{-1}}$$

Can implement rate with $\tau = \frac{1}{\Gamma} \left[1 + \frac{\theta}{\beta} (1 + \alpha_2 \beta)\right]$.

• Observations:
  1. $s_i^*$ independent of $\Gamma$
  2. $s_i^*$ determined by impact on current and future generation
Back to the main model...
• Uses Social Security 2006 (public use) earning-master-file

• Restrict to males ages 20 and above with birth-year $\geq 1910$

• Split in two groups by age: Young $\in [20, 50)$ and Old $\in [50, \infty)$

• If required, restrict to individuals with at least 30 years data centered at age 50 (Ending up with 108,522 individuals)

• Other parameters: $\beta = 0.4 = 0.97^{30}$ (0.8 in paper); $\alpha = 0.2$, $\kappa = 0.5$.

→ Warning: data is W-2 based and top-coded at SS taxable maximum
Main Model: Gamma

Recall \( \Gamma = \int [\kappa \eta(1 - \alpha) + \alpha]^{-1} d\Psi(\eta) > 1 \)

- Potential concern: model assumes stationary \( \Gamma \)
**Proposition 3** characterizes threshold values for societal discount factor. If $\theta$ is above the threshold $\Rightarrow$ capital is subsidized.

In the next slides let’s set $\theta = 1/3$. 
Main Model: Saving Rate

\[ s = \frac{1}{1 + [\alpha \beta \Gamma]^{-1}} \]

\[ s^* = \frac{1}{1 + \left[ \alpha \beta + \frac{\theta}{1 - \alpha \theta} \alpha (1 + \alpha \beta) \right]^{-1}}; \]
Main Model: Saving Rate

In Paper

\[ s = \frac{1}{1 + [\alpha \beta \Gamma]^{-1}} \]

\[ s^* = \frac{1}{1 + \left[\alpha \beta + \frac{\theta}{1-\alpha \theta} \alpha(1 + \alpha \beta)\right]^{-1}}; \]

- Higher income-risk increases (the model) saving rate over time
Main Model: Taxes

In Paper \((1 - \tau^*) = \frac{1}{\Gamma} \left( 1 + \frac{\theta}{\beta} \frac{1 + \alpha \beta}{1 - \alpha \theta} \right)\)

- As anticipated: subsidies end in 80s due to increase in income risk
Room-Based Lit Review (Incomplete)

• **Farhi, Sleet, Werning, Yeltekin (2012):**
  ➔ What about commitment?

• **Golosov, Troshkin, Tsyvinski (2016):**
  ➔ What about consumption-labor distortions?

• **Stantcheva (2017):**
  ➔ What about human capital?
Discussion of Ideas for: Krueger, Ludwig (2018 2020)

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Some Key Assumptions

- In which direction to write the next paper?
- Paper already considers Epstein-Zin preferences
- For ideas, let’s look at some data relative to:
  1. Income Process
  2. The Saving Rate
  3. Feasibility
The Income Process

In the paper:

- Income when young: \( i_y(t) = (1 - \kappa)w_t \)

- Income when old: \( i_o(t) = \kappa \eta_{t+1} w_{t+1} \)

- \( \eta_t \): i.i.d. and mean one; \( w_t \) common wage component

- Derive \( \kappa \) averaging in the cross-section or panel:

\[
\frac{E^c[i_y(t+1)]}{E^c[i_o(t)]} = \frac{1 - \kappa}{\kappa}
\]

\[
E^p \left[ \frac{i_o(t)}{i_y(t)} \right] \cdot \frac{E^c[i_y(t)]}{E^c[i_y(t+1)]} = \frac{\kappa}{1 - \kappa}
\]
The Income Process: Age Timing

Source: SSA EPUF 2006

Kappa - Cross-Section

Source: SSA EPUF 2006

Kappa - Panel

• Constant over time, some issue with panel approach (heterogeneity? prices?)
• Caveat: Guvenen, Karahan, Ozkan, Song (2016)

For ages 25-55, heterogeneity at top of income distribution
The Income Process: Age Timing

- Constant over time, some issue with panel approach (heterogeneity? prices?)

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  For ages 25-55, heterogeneity at top of income distribution
The Income Process: Uncertainty

- **Key:** when do households face most uncertainty?
The Income Process: Uncertainty

- **Key:** when do households face most uncertainty?

![Variance-to-Mean Ratios](Source: SSA EPUF 2006)

- Consistent with Huggett, Ventura, Yaron (2011)
The Saving Rate

- In the paper, young save. Key driver is precautionary saving

- Use *Survey of Consumer Finances* for 2016

- Split in two groups by age: Young ∈ [24, 54) and Old ∈ [54, 84)

- With minor fudging:

  \[ s_{\text{young}} = 5.5\% \quad s_{\text{old}} = 0.0\% \]
The Saving Rate: Smoothed Age Patterns

Saving Rate by Financial Instrument

- Total Financial
- Excluding Retirement
- Transaction Accounts

Source: SCF 2016

- **Retirement** = Quasi-liquid retirement accounts + Other managed assets + Other financial assets
$k_{t+1}$ determined entirely by domestic savings. What do we observe:
$k_{t+1}$ determined entirely by domestic savings. What do we observe:

![Gross Saving - Gross Capital Formation](source)

- Source: WDI (NY.GNS.ICTR.ZS, NE.GDI.TOTL.ZS)
Conclusion

S: Clean and sharp characterization of policy and tradeoffs

W: Sharpness comes at a cost: appeal of the assumptions
   (lifetime timing saving & uncertainty; non-stationarity; commitment)

O: Ability to apply analysis to other margins: tech-change; aging population

T: A crowded landscape, need a loud voice
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