Consumption, Saving, and the Distribution of the Permanent Income

Author: Ludwig Straub (Harvard)
Discussant: Tao Wang (JHU)

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Motivations

- Theoretical benchmark
  - **Linearity**: Consumption linear to Permanent income in many standard models despite concave C on income/liquid Wealth
  - **Neutrality**: macroeconomic aggregation is **independent** from permanent income distributions("Gorman aggregation"(Gorman, 1961) over P)
- Documented macro facts
  - Rich save "too much": more than enough for financing their(and their kids) consumption
  - Rising wealth inequality partly driven by inequality in the **fixed component of** income
    - there are debates on if the dispersion in permanent income shocks increased in recent decades
  - Decline of real interest rate

Main contribution(claimed)

- Empirical results
  - Concavity/rejection of linearity: C elasticity with respect to P ≈ 0.7 from PSID data
    - P is not directly observable, needs a variety of tests depending on income process and data measurements issues
- Theoretical results
  - Incorporating non-homothetic preference(NP) in standard incomplete-market OLG model:
    - NP bequest motive
    - NP over life-cycle
  - **Non-neutrality**: macroeconomic aggregation depends on P distributions
    - rise in P inequality from 1970-2014 $\to$ 1% decline in real interest rate and 30% wealth/GDP ratio

One-period model (for one dynasty/generation)

$$\max_{c_t} \quad u(c_t) + \beta U(a_{t+1})$$

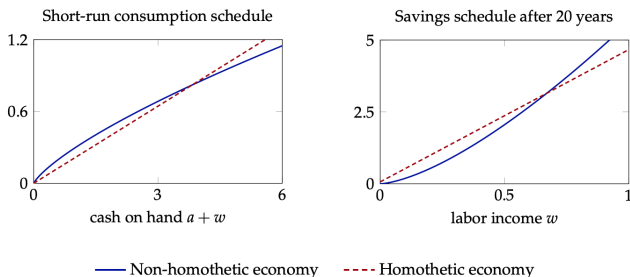$$s.t. \quad c_t + R^{-1}a_{t+1} \le a_t + \underbrace{w_t}_{P}$$

$$u(c) = \frac{c^{1-\sigma} - 1}{1 - \sigma}$$

$$U(a) = \frac{a^{1-\Sigma} - 1}{1 - \Sigma}$$

- Two "goods": c_t and a_{t+1}
- $\sigma = \Sigma$: homothetic preference(HP), i.e. constant elasticity of saving regardless of income
- $\sigma > \Sigma$: non-homothetic preference(NP), i.e. higher elasticity of saving of the rich, a **luxury** good

One-period model, continued

Figure 1: Stylized model: Consumption and savings schedules.

- $\phi = \frac{\Sigma}{\sigma}$: the MPC out of P
- smaller $\phi \to$ more concavity of the C function of P (w here)
- $\phi = 1$: HP
- $\phi \neq 1$: NP (but only focused on < 1 in this paper)

From one-period to a N-period life-cycle(LC)

- One-period = the terminal period of a N-period LC
- ϕ: the smaller → the stronger strength of joy-of-giving motive
    - $\phi = 1$: C is linear to P: a constant fraction of W and P
    - $\phi < 1$: C is concave to P, the richer, the bigger fraction saved for kids
- But this can happen for any period in life, not necessarily just before you die!
    - let ϕ decline over the life: NH over LC, possible because spending on kids are back-loaded
    - some general joy-of-saving motive
- Reminders
    - Not the bequest motive per se, but its luxury nature → NP.
    - It does not matter w/o uncertainty: income risks → C concave on W but not P
    - C function can be arbitrary func on W

General equilibrium effects

- Assuming two different dynasties with different P: rich v.s. poor
- The wage differences determined by respective share in the production (relative to population share)
- Under HP: income share of two groups do not matter for aggregate
- Under NP: rich group save more disproportionately
  - $\rightarrow$ higher wealth inequality than income inequality
  - $\rightarrow$ higher wealth to income ratio
  - $\rightarrow$ more aggregate saving $\rightarrow$ lower interest rate in GE

Generalizability of linearity/neutrality

- Environment
  - Precautionary saving models: uninsured income risks
  - Ex-ante heterogeneity: born to be a certain skill type
  - OLG + infinite horizon: age-dependent death probability
  - Production: CD with income shares affecting P
  - Tax schedules: constant tax on bequest and a possibly age-dependent income tax
  - Stochastically skill-passing from parents to kids
  - Receive bequest when parents die (not at the birth of the kids)
- Assumptions
  - HP + linear tax schedule + no redistribution via bequest + unique wealth distribution for given r
- Propositions
  - Linearity of C in P
  - Var(log C) and Var(log W) move one-to-one to Var(P)
  - Neutrality: aggregate C linear to aggregate W

Evidences for non-linearity

- Data
  - PSID: biannual data from 1999-2013 with both C and Y
  - 5,881 distinctive HH, age between 30 and 65
  - C and Y are regression residuals
- Estimates of $\phi < 1$
  - Approximate P with average Y over T-year window or Y's FE: 0.396-0.645 (downward bias due to measurement error)
  - With a persistent component: future Y(or differences) as IV of P: 0.599-0.741
  - With a random-walk component: initial Y entering job market as IV of P: 0.732

On this paper

- One more step from incomplete market paradigm
  - the paradigm essentially is marked by the breakdown of "Gorman aggregation" on wealth
  - Krusell and Smith (1998): asymptotic linearity of the C on W because of the concave C from the "poor" are not that important for aggregation
  - but the asymptotic representative agent has become too hard to defend later
  - from ex-post heterogeneity to **ex-ante** heterogeneity: non-homothetic preferences + heterogeneous skill
- this opens up a gateway for more behavioral research that potentially explains this non-homotheticity
  - Veblen: conspicuous consumption/leisure class
  - People directly derive utility from wealth/status/power(Carroll, 1998)

Comments on the research

- A very good example of a job market/dissertation paper
  - An old question discussed in different ways: but he dares to make it more general
  - Go extra miles, by a lot
  - Talking to the literature as much as possible
  - Lots of extensions that incorporate insights from seemingly less relevant literature
  - Careful calibration, at least appearing so!
  - Taking the chance to showcase the technical skills: solving high-dimensional heterogeneous agent models

Carroll, C. D. (1998). Why do the rich save so much? Technical report, National Bureau of Economic Research.

Gorman, W. M. (1961). On a class of preference fields. *Metroeconomica*, 13(2):53–56.

Krusell, P. and Smith, Jr, A. A. (1998). Income and wealth heterogeneity in the macroeconomy. *Journal of political Economy*, 106(5):867–896.