The Optimal Quantity of Capital and Debt

Hagedorn, Holter, and Wang (HHW)

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The question and earlier findings

The Question: What is the optimal quantity of government debt (B) and optimal tax on capital (τ_k)?

Prior literature (Ramsey taxation):

- Representative agent models: Barro (1979); Chamley (1986) and Judd (1985).

  $>$ Optimal long-run $\tau_k = 0$.

  $>$ Optimal B/Y set to smooth labor tax distortions (long-run level depends on initial conditions).

The question and earlier findings

The Question: What is optimal B/Y and τ_k?

- Incomplete markets: Aiyagari (1995), Aiyagari and McGrattan (1998), Domeij and Heathcote (2004).

  Insurance and *redistribution* considerations also play roles.

  $>$ Optimal $\tau_k > 0$ in the long run.

  $>$ Until recently, no quantitative findings for optimal τ_k and B/Y.

The question and recent findings

The Question: What is optimal B/Y and τ_k?

- Acikgoz (2015):

  $>$ Points out optimal steady state is independent of initial conditions.

  $>$ Uses this to compute optimal *long-run* B/Y and τ_k for US economy.

This paper

Optimal policy in incomplete markets framework.

Contribution:

- Formalizes and proves that optimal steady-state allocations and policies are independent of initial conditions.
- Provides quantitative evaluation of optimal B/Y and τ_k for US economy including full transition.

Benchmark quantitative findings

Optimal policy in steady state:

- $B/Y = 4$, $\tau_k = 0.11$, $\tau_n = 0.77$.
- Very high B/Y and low τ_k compared to status quo policy.

Intuition:

1. Precautionary savings imply: $\underbrace{1 + (1 - \tau_k)r}_{\equiv 1+\bar{r}} < \frac{1}{\beta}$.

Optimal to set K at Golden Rule level: $1 + F_K - \delta = \frac{1}{\beta}$.

$$\Rightarrow \tau_k > 0.$$

2. When $B \uparrow \Rightarrow \bar{r} \uparrow \Rightarrow \tau_k \downarrow$.

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Optimal to set K at Golden Rule level: $1 + F_K - \delta = \frac{1}{\beta} = 1 + r$.

$$\Rightarrow \tau_k > 0.$$

2. When $B \uparrow \Rightarrow \bar{r} \uparrow \Rightarrow \tau_k \downarrow$.

Benchmark quantitative findings

Increasing B increases $\bar{r}$ and $(K + B)/Y$, implying a higher fraction of asset income and lower fraction of labor income in total income.

- Since labor income is risky, provides insurance.
- Since asset income is unequally distributed, has a redistributive cost.
- Which dominates depends on calibration of wage process and implied income risk vs. wealth inequality.
- In HHW, former dominates: high B/Y and low τ_k optimal.
- In Dyrda and Pedroni (2016), the opposite is true and $B/Y = -0.15$ and $\tau_k = 0.45$ (follow Catenada et al 2003).

Evaluation

Very interesting paper on a very important issue!

- Main idea that there is a reason to tax capital and issue government debt in incomplete markets is not novel.
- Quantitative analysis is the novelty and results are striking.
- Seems like results sensitive to calibration (of esp. the wage process and implied labor income risk and wealth inequality).
- Can you put more empirical discipline on model implied labor income risk and wealth inequality?

Comments

- With higher lump-sum transfers, optimal B/Y decreases. Would results remain under progressive taxes?
- Counterfactual exercises on wage process that changes implied risk and inequality.
- How would your results change in an open economy?
- Does the Straub-Werning criticism apply? Specifically, do you force the economy to converge to steady state in computation?