Robinson Crusoe Model

Seyed Ali Madanizadeh

Sharif U. of Tech.

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What affect Output/Labor Force Decisions

- Robinson Crusoe Model of Macroeconomics
- Labor Leisure Decision
  - Social Planner solution

Decentralized Economy

- Robinson Receives Wages and profits
- Firms produce and sells
- Markets clear

Decentralized Economy

- Income effect
- Subsitution effects
- How taxes affect Labor supply
- Welfare Theorems
- How General Equilibrium works
- How results depend on productivity, leisure parameters

Intertemporal Labor supply decision

- a Two-period consumption-Leisure-Saving problem

References

- Hall and jones 1999: "Why Do Some Countries Produce So Much More Output per Worker than Others?"
- Hsieh and Klenow 2010: "Development Accounting"

Decentralized Economy

- Robinson Crusoe Household

$$\begin{aligned} & & \max U(C, H) \\ \text{s.t.} \quad & pC & \leq \quad wH + \Pi \end{aligned}$$

for $U(C, H) = (1 - \alpha) \log C + \alpha \log (T - H)$

- Robinson Crusoe's firm

$$\begin{aligned} \max \Pi & = & pY - wH \\ \text{s.t.} \quad Y & \leq & F(H) = AH^{\theta} \end{aligned}$$

- Equilibrium

$$\begin{aligned} C & = & Y \\ H^d & = & H^s \end{aligned}$$

Robinson Crusoe Household

$$\begin{aligned} \frac{-U_H}{U_C} &= \frac{w}{p} \Rightarrow \\ \frac{a}{1-\alpha}\frac{C}{l} &= \frac{w}{p} \end{aligned}$$

$$\begin{aligned} l &= \alpha\left(T + \frac{\Pi}{w}\right) \\ H^s &= (1-\alpha)\,T - \alpha\frac{\Pi}{w} \end{aligned}$$

Robinson Crusoe Firm

$$
\begin{aligned}
p\theta A H^{\theta-1} &= w \\
H^d &= \left(\frac{\theta A p}{w}\right)^{\frac{1}{1-\theta}} \\
Y &= A^{\frac{1}{1-\theta}} \left(\frac{\theta p}{w}\right)^{\frac{\theta}{1-\theta}}
\end{aligned}
$$

$$
\begin{aligned}
wH^d &= \theta p Y \\
\Pi &= (1-\theta)\, pY = \frac{1-\theta}{\theta} wH^d
\end{aligned}
$$

Decentralized Economy Equilibrium

$$
\begin{aligned}
H^d &= H^s \\
H &= (1-\alpha)\,T - \alpha\frac{1-\theta}{\theta}H \Rightarrow \\
H &= \frac{(1-\alpha)\,T}{1+\alpha\frac{1-\theta}{\theta}} \\
\frac{w}{p} &= \frac{\theta A}{\left(\frac{(1-\alpha)\,T}{1+\alpha\frac{1-\theta}{\theta}}\right)^{1-\theta}} \\
C &= Y = A\left(\frac{(1-\alpha)\,T}{1+\alpha\frac{1-\theta}{\theta}}\right)^{1-\theta}
\end{aligned}
$$

Decentralized Economy

- Income Effect
- Substitution Effect