ECON 402 Discussion: Week 3

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Announcements

- Homework 1 grades coming soon... always compare solutions to your answers!
- Goal is create your own running study guide with practice questions for exams

- Topics today
  1. Market for loan-able funds
  2. Review homework 1
  3. Solow model of growth

Some important things to know...

1. Graph capital and labor markets under perfect competition (and fixed supply)
2. Relate wages and rental rates on capital to production function derivatives (supply side)
3. Divide up total output between factors under constant returns to scale

4. Specify consumption and investment as functions of real interest rate (demand side)
5. Connect goods market clearing ($Y = C + I + G$) and investment savings ($I = S$) identities

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\begin{aligned}
C_t &= C(Y_t - T_t, r) \quad \text{where } \frac{\partial C}{\partial r} < 0 \\
I_t &= I(r) \quad \text{where } \frac{\partial I}{\partial r} < 0 \quad \text{follows} \quad \text{MPK} - \delta \cdot \frac{P_K}{P} = r \cdot \frac{P_K}{P}
\end{aligned}
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$$\begin{aligned} Y &= C + I + G \\ Y - C - G &= I \\ S &= I \end{aligned}$$

Putting it all together = short-run equilibrium

Neoclassical model has 4 equations for 4 endogenous variables: Y, C, I, r

$$\begin{aligned} Y &= F(K, L) \\ Y &= C + I + G \\ C &= C(Y - T, r) \\ I &= I(r) \end{aligned}$$

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The market for loan-able funds is just another way of expressing the goods market clearing condition! Note that aggregate (desired) savings depend positively on the interest rate

$$\begin{aligned} S(r) &= Y - C - G \\ &= Y - C(Y - T, r) - G \\ &= F(K, L) - C(F(K, L) - T, r) - G \end{aligned}$$

while aggregate (desired) investment $I(r)$ depends negatively on $r \Rightarrow$ unique solution r^*

Shifting curves and changing equilibrium

EX1: Contrast the effects of immigration shocks on labor vs capital markets.

EX2: What does technological innovation do to short-run interest rates?

EX3: How does government spending via borrowing affect availability of loan-able funds?

Review Homework 1

Economic Growth and the Solow Model

- Production: $Y_t = A_t \cdot K_t^{\alpha} L_t^{1-\alpha}$ with $\alpha \in (0, 1)$
- Accounting: $Y_t = C_t + I_t$ with $G_t = NX_t = 0$

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  - $I_t = sY_t$ where $s \in (0, 1)$ is exogenous
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  - $\Delta K_t = I_t - \delta K_t$ where $\delta \in (0,1)$
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- Per capita quantities: $k_t = \frac{K_t}{L_t}$, $y_t = \frac{Y_t}{L_t}$, and $c_t = \frac{C_t}{L_t}$
- Input prices (under perfect competition): $R_t = MPK$ and $w_t = MPL$

Example: The Golden Rule

- Assuming no technology ($A_t = 0 \ \forall t$) and non population growth ($n = 0$), what level of saving maximizes consumption per capita in steady state ($\Delta k_t = 0$)?

1. Find the law of motion for the capital-labor ratio k_t
2. Find the steady state capital-labor ratio k_* where $\Delta k_t = 0$
3. Find consumption per capita in steady state c_*
4. Solve the first-order condition (FOC) $\frac{\partial}{\partial s} c_*(s) = 0$ for optimal s