

Intermediate Macro Midterm Practice

June 15, 2016

Xian's GDP

Xian produces Liangpi and Roujiamo. Complete the following table to calculate the size of the Xianese economy.

	2016	2017	Percentage change
Quantity of Liangpi	70	75	
Quantity of Roujiamo	120	150	
Price of Liangpi (¥)	25	30	
Price of Roujiamo (¥)	8	8.4	
Nominal GDP			
Real GDP in 2016 prices			
Real GDP in 2017 prices			
Real GDP in chained prices, benchmarked to 2016			

Population Growth in the Production Model

Consider adding simple population growth to the production model. In particular, suppose $\bar{L}_t = (1 + g)^t L_0$, where L_0 is given as a parameter and represents some initial population. The model is otherwise unchanged and thus consists of five equations:

- Production: $Y_t = \bar{A} K_t^{\frac{1}{3}} L_t^{\frac{2}{3}}$
- Capital Markets: $r_t = \frac{1}{3} \bar{A} \left(\frac{L_t}{K_t} \right)^{\frac{2}{3}}$
- Labor Markets: $w_t = \frac{2}{3} \bar{A} \left(\frac{K_t}{L_t} \right)^{\frac{1}{3}}$
- Capital Stock: $K_t = \bar{K}$
- Labor Stock: $L_t = \bar{L}_t$

1. What is the growth rate of the population in this economy?
2. Solve the model. That is, find equations describing all of the endogenous variables (w_t , r_t , K_t , L_t , and Y_t). Explain why each variable follows the path that it does.
3. Plot what happens to each of these variables over time. Does this economy reach a steady state?
4. What happens to output per person in this economy? Why?
5. Let's also now grow the capital stock with time, so that equation 4 is replaced with $K_t = \bar{K}_t$, and $\bar{K}_t = (1 + G)^t K_0$. Repeat the above for this model. Find a condition which makes output per person constant over time.