

Economics 613: Macroeconomics I

Fall 2006

Cornell University

Problem Set #2

Due: Wednesday, September 13, 2006

1 One-sector Production

$$Y = F(K, L)$$

$$C + Z = Y$$

$$K > 0, L > 0, C \geq 0, Z \geq 0$$

- (a) Given K and L , what is the PPF (production possibility frontier)? Be precise.

Let $F(K, L) = 2K^{\frac{1}{3}}L^{\frac{2}{3}}$. Assume perfect competition.

- (b) What do we know about the competitive shares (of the output) for capital and labor?
(c) How is the composition of output affected by output prices?
(d) If $(K, L) = (8, 8)$ what are the rental rate on capital (r) and the wage rate for labor (w)? These are the input (or factor) prices.

The ratio $\omega = \frac{w}{r}$ is the factor price ratio; let $k = \frac{K}{L}$.

- (e) How does ω vary with k ?

2 More One-sector Model

- (a) Show that if the production function is

$$AK^aL^{1-a},$$

where $0 < a < 1$, that capital's share is a and labor's share is $1 - a$.

- (b) Assume constant returns to scale and perfect competition. Show that if capital's share is a and labor's share is $1 - a$, then the production function is

$$AK^aL^{1-a},$$

where $A > 0$ is an undetermined constant.