

**Economics 227: Intermediate Macroeconomics  
Assignment 2**

**This assignment is due before 5PM on Friday, March 18th.**

1. In the long-run model, suppose that a stock market crash reduces consumers' wealth. Use graphs to explain the effect on investment and the interest rate.
  
2. Suppose that production in an economy is given by the Cobb-Douglas function:

$$Y = F(K, L) = AK^\alpha L^{1-\alpha}$$

- (a) Suppose the real wage is 1 unit in 2011, 2 units in 2012, and 2.4 units in 2013. If labor earns  $\frac{1}{2}$  of total income, then what's average labor productivity?
  - (b) Is it possible for this growth in the real wage to coincide with a constant capital-labor ratio? Why or why not?
  - (c) Now suppose the real wage is some number  $\frac{W}{P}$ . If a computer virus destroys 15% of Lebanon's capital stock (and doesn't change the number of workers), what is the percentage change in  $\frac{W}{P}$ ?
  - (d) If this computer virus destroys 15% of Lebanon's capital stock and doesn't change the number of workers, what is the percentage change in the real interest rate / rental return on capital  $r = \frac{R}{P}$ ?
  - (e) Now suppose a new virus destroys a further 15% of Lebanon's capital. Will the magnitude of the change in the real wage be larger, smaller, or the same as it was in part (c)?
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3. Suppose production in Lebanon is given by the Cobb-Douglas function  $Y = AK^\alpha L^{1-\alpha}$ . We estimate Lebanon's GDP is \$40 billion, that there are 4 million workers, and total wages are about 64% of GDP. Finally, the interest rate / rental return on capital is  $r = 10\%$ . Then what's the estimated value of Lebanon's capital stock?

4. Consider the CES production function

$$Y = A [\alpha K^\xi + \beta L^\xi]^{\frac{1}{\xi}}$$

- (a) Show that the CES production function is CRS.
- (b) If production is CES, what are the real wage and rental return on capital?
- (c) Show that Euler's Theorem holds.