

1. During the Great Depression, investors suffered from a loss in business confidence once the stock market crashed in 1929. Use the model below:

$$\begin{array}{lll} Y = 1650 & C = 200 + 0.6(Y - T) & \text{Consumption function} \\ G = 250 & I_1 = 400 - 2000r & \text{Investment function} \\ T = 150 & & \end{array}$$

- Suppose there is a decrease in business confidence. Find the new equilibrium interest rate (r), investment (I) and consumption (C) with the new investment function: $I_2 = 350 - 2000r$. Compare your answers to those in part a) of Question 5 on Problem Set #1.
 - What happens to private and public savings? Total savings?
 - Illustrate the effects of a decrease in business confidence on a savings-investment diagram.
 - How would your answer to part e) change if savings does respond to the interest rate? Illustrate using a new savings-investment diagram.
 - When interest rates are high, it is observed that individuals are discouraged from buying durable consumption goods like cars. Does this observation correspond to the assumptions about savings made in part c) or part d)?
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2. Country A and country B both have the production function $Y = F(K,L) = K^{1/2}L^{1/2}$. Assume that both countries have a population growth rate of 3% per year and that 7% of capital depreciates each year in both countries. Assume that country A saves 20% of its income and country B saves 30%.
- Derive the per-worker form of the production function above.
 - Using part a) and the steady state condition ($\Delta k = 0$), compute the steady state level of capital and output per worker in each country.
 - Calculate the steady state level of consumption per worker in each country.
 - The golden rule is defined as the level of capital per worker that maximizes consumption. Given this, which of the two countries is closer to the golden rule? Why does a smaller marginal propensity to consume (e.g., a higher savings rate) result in higher steady state consumption?
 - Find the golden rule level of capital stock for the production function in part a), the $MPK = \frac{1}{2} k^{-1/2}$.
 - Assume the government takes action to increase the savings rate to get reach the golden rule. Illustrate the transition to the golden rule level of capital for country B. Use the Solow Growth model diagram (graphing k against y). Also, include the transition paths for i , c , k , and y .
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3. China's real per capita GDP growth rate (percent change in output) has been much higher than that in the U.S. during the 1990s. Also, China's real GDP growth (not in per capita terms) has been higher than that in the U.S. during this period.
- Using the Solow growth model (with no technological progress or population growth), is there a reason to believe this disparity in per capita growth rates will disappear over time?
 - How would your conclusion to part a) change if China had a higher saving rate than the U.S.?
 - Suppose that China and the U.S. had the same savings rate, but China had a higher population growth rate. Could this explain the disparity in real per capita GDP growth rates? What about the disparity in real GDP growth (not in per capita terms)?
 - How would your conclusion from part a) change if you considered technological progress in the Solow growth model, where the rate of technological progress is higher in China?
 - How would your conclusion from part a) change if you considered an endogenous growth model, using the production function $y = Ak$.

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4. Suppose an economy has a Cobb-Douglas production function: $Y = F(K,L) = K^{1/3}L^{2/3}$. The economy has 1000 units of capital and a labor force of 1000 workers.
- Derive the equation describing labor demand for the economy. (Hint: $MPL = 2/3 K^{1/3}L^{-1/3}$ and the firms always maximize profits so that $MPL = W/P$).
 - What is the real wage, given the labor force in the economy? Assume that labor supplied equals labor demanded, so there is no unemployment. What are employment, output, and the total amount earned by workers?
 - Suppose a minimum wage law is imposed so that firms must pay workers 1 unit of output (e.g., $W/P = 1$). Is this wage higher or lower than the equilibrium wage? How many workers will be hired at this wage? What happens to unemployment and output? Does the minimum wage help workers?
 - Other than minimum wages, why else might the real wage differ from the equilibrium real wage?
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5. Suppose that in the U.S., C (currency) = 250 and D (deposits) = 500. Use this information to answer the questions below
- What three ways could the Fed could cut the money supply?
 - Suppose that the U.S. is under a 100% reserve system. If the Fed cuts the monetary base by 100, how much with the money supply decrease?
 - Suppose instead that U.S. has a fractional reserve system, with a reserve requirement of 5%. What is the level of reserves (R)? What are the money stock (M) and monetary base (B)?
 - In part (c), what is the value of the money multiplier? If the Fed cuts the monetary base by 100, how much with the money stock decrease?
 - Why do the answers to part b) and part d) differ, even though the change in the monetary base is the same size in both cases?
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6. Suppose that the velocity in Canada is constant and real GDP grows at 6% per year, the money stock grows at 9% each year, and the nominal interest rate is 7%.
- Using the quantity theory of money and the Fisher relationship, find the inflation rate and real rate of interest in Canada.
 - Suppose the Bank of Canada (Canada's central bank) decides to lower inflation by cutting the money supply growth rate to 8%. What are the new inflation rate and real rate of interest in Canada? Assume the classical dichotomy holds.
 - Why might the Bank of Canada want to cut inflation? In other words, what are the costs associated with inflation (not hyperinflation)?
 - Why might Canada's government not support the Bank of Canada's decision to cut inflation? Is this an issue if Canada has well-developed capital markets?
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