Problem Set 5
Answers and Selected Solutions

Principles of Economics

David A. Díaz

Economic Growth

1. The Peapod Restaurant uses all of the following to produce vegetarian meals. Which of them is an example of physical capital?
   (a) The owner's knowledge of how to prepare vegetarian entrees.
   (b) The money in the owner's account at the bank she borrowed money from.
   (c) The tables and chairs in the restaurant.
   (d) The land the restaurant was built on.

   Solution: Physical capital is the stock of equipment used to produce goods and services.

2. Institutions are thought to be the _____causes of economic growth.
   (a) proximate
   (b) immediate
   (c) ultimate
   (d) direct

3. Because capital is subject to diminishing returns, higher saving and investment does not lead to higher
   (a) growth in the short run.
   (b) growth in the long run.
   (c) income in the short run.
   (d) income in the long run.

   Solution: Growth in the long run is limited due to diminshing returns to capital. Sustained growth is the result of innovation and improvements in technology.

4. Which of the following would be considered an increase in human capital?
   (a) An increase in the training of heart disease researchers.
   (b) An increase in the use of heart disease centers.
   (c) The discovery of a cure for broken hearts.
   (d) An increase in the number of heart disease researchers.

Solution: Human capital is the knowledge and skills that workers acquire through education, training, and experience.

5. Which of the following is NOT a determinant of a country's long-run productivity?
   (a) Natural resources
   (b) Human capital
   (c) Money supply
   (d) Physical capital

6. Which of the following is NOT a kind of institution encouraging investment and the efficient organization of the factors of production?
   (a) Dependable legal system
   (b) Political stability
   (c) Honest government
   (d) Social safety nets

Solution: See class notes.

7. If a country's real GDP per capita was \$40,000 in 1980 and grew to \$80,000 in 2010, then the country's annual growth rate during this period would have been approximately
   (a) 2.3%.
   (b) 50%.
   (c) 3%.
   (d) 100%.

Solution: Country doubled it real GDP per capital in 30 years. Rule of 70: Doubling time $\approx 70/g \Rightarrow 30 = 70/g \Rightarrow g = 70/30 = 2.33\%$.

8. Suppose the real GDP in Slovenia in 1950 was \$50,000. If by 1977, the real GDP was \$200,000, what was the approximate annual growth rate in the country from 1950 to 1977?
   (a) 2.6%
   (b) 300%
   (c) 4.0%
   (d) 5.2%

Solution: Similar calculation as the last question, but GDP doubled twice (quadrupled) in 27 years. $g = 2 \times (70/27) = 5.2\%$.

9. The opportunity cost of growth is
   (a) a reduction in current investment.
   (b) a reduction in current savings.

(c) a reduction in current consumption

(d) a reduction in taxes.

10. If a production function exhibits constant returns to scale,

    (a) doubling all of the inputs has absolutely no impact on output because output is constant.

    (b) doubling all of the inputs doubles output.

    (c) doubling all of the inputs more than doubles output due to the catch-up effect.

    (d) doubling all of the inputs less than doubles output due to diminishing returns.

11. Our standard of living is most closely related to

    (a) how hard we work.

    (b) our supply of capital.

    (c) our supply of natural resources.

    (d) our productivity.

12. Which of the following statements is true?

    (a) Countries may have a different level of GDP per person, but they all grow at the same rate.

    (b) Countries may have a different growth rate, but they all have the same level of GDP per person.

    (c) Countries all have the same growth rate and level of output because any country can obtain the same factors of production.

    (d) Countries have great variance in both the level and growth rate of GDP per person; thus, poor countries can become relatively rich over time.

13. Which of the following describes an increase in technological knowledge?

    (a) A farmer discovers that it is better to plant in the spring rather than in the fall.

    (b) A farmer buys another tractor.

    (c) A farmer hires another day laborer.

    (d) A farmer sends his child to agricultural college and the child returns to work on the farm.

14. Which of the following government policies is *least* likely to increase growth?

    (a) An increase in expenditures on public education

    (b) Increased restrictions on foreign imports.

    (c) Reduce restrictions on foreign capital investment.

    (d) Eliminate corruption in the legislative branch.

15. To increase growth, governments should do all of the following except

    (a) promote free trade.

    (b) encourage saving and investment.

    (c) encourage foreigners to invest in their country.

    (d) encourage research and development.

    (e) nationalize major industries.

The Solow Model

1. Suppose the production function in the United States was $y = \sqrt{k}$ before the Information Technology revolution took place. Assume the depreciation rate is 5% and the country invests 30% of its output. After the revolution, productivity increased by 50%. Suppose that at the time of the change, $k_0 = 36$. This implies that the economy moved from _____economic growth to _____growth.

   (a) positive; positive

   (b) positive; zero

   (c) zero; positive

   (d) negative; positive

   Solution: Before the IT revolution: $y = \sqrt{k} \Rightarrow A = 1$ & $i = .3\sqrt{k}$. $d = .05k$. $k_0 = 36 \Rightarrow i = .3(6) = 1.8$ & $d = .05(36) = 1.8$. Since $i = d$ there will be zero economic growth (country is at its steady state).
   After IT revolution: $A = 1(1.5) = 1.5 \Rightarrow y = 1.5\sqrt{k} \Rightarrow i = .3(1.5\sqrt{k}) = .45(6) = 2.7$. Depreciation is still 1.8. Since $i > d$, the country will experience positive economic growth.

2. Suppose a country is currently at its steady state. If the country's population growth rate permanently increases from 2% to 4%, which of the following must be true?

   i. Consumption will immediately increase, and the new steady state consumption level will be greater than the old steady state consumption level.

   ii. Investment will immediately decrease, and the new steady state investment level will be less than the old steady state investment level.

   iii. The new steady state level of capital will be less than the old steady state level of capital, and the new steady state level of output will be less than the old steady state level of output.

   (a) i and ii

   (b) ii and iii

   (c) i only

   (d) iii only

   (e) i, ii, and iii

3. If output per worker in an economy is 20, and the investment function is given by $i = .25y$, then

   (a) 20 units of output are being invested.

   (b) 15 units of output are being invested.

   (c) 20 units of output are being consumed.

   (d) 15 units of output are being consumed.

   Solution: $i = .25(20) = 5$. $c = y - i = 20 - 5 = 15$.

4. Country X and country Y both have the same production function, $f(k) = 1.5\sqrt{k}$. Moreover, the current level of capital per worker in each country is $k_0 = 400$. In country X, output per worker is growing, while in country Y it is falling. According to the Solow Model, *ceteris paribus*, which of the following could account for this difference?

   (a) The savings rate in country X is greater than that in country Y.

   (b) The population growth rate in country X is greater than that in country Y.

   (c) Capital depreciates faster in country X than in country Y.

   (d) Any of the above could account for this difference.

   (e) None of the above could account for this difference.

   Solution: Country X must be below its steady state since output is growing, while country Y must be above its steady state. Thus country X must have a higher savings rate. Each of the other options would imply that country X has a lower steady state level of output than country Y.

5. Suppose a country is currently at its steady state. If the country decides to permanently decrease its savings rate, which of the following must be true?

   i. Consumption will immediately increase, and the new steady state consumption level will be greater than the old steady state consumption level.

   ii. Investment will immediately decrease, and the new steady state investment level will be less than the old steady state investment level.

   iii. The new steady state level of capital will be less than the old steady state level of capital, and the new steady state level of output will be less than the old steady state level of output.

   (a) i and ii

   (b) i and iii

   (c) ii and iii

   (d) i, ii, and iii

   Solution: See class notes. Consumption will immediately decrease, but may be higher or lower at the new steady state depending on the savings rate. Thus (i) is not necessarily true.

6. Figure 1 shows the production function of a small country, as well as its investment and depreciation functions. Assume there is no population growth.

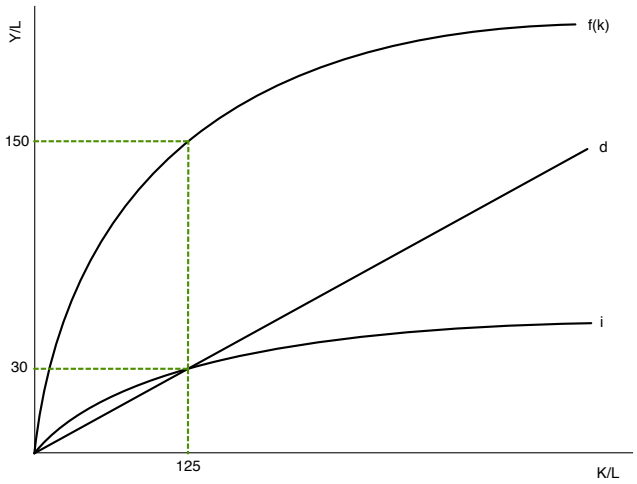


Figure 1: Production, Investment, and Depreciation

The percent of output per worker that is invested every period is _____and the rate of capital depreciation is _____.

(a) 20%; 20%

(b) 24%; 20%

(c) 24%; 24%

(d) 20%; 24%

Use the following to answer questions 7-8. Each worker in an economy has a capital stock of 900 units and a production function given by $y = \sqrt{k}$. This year it consumed 10 units of output and 10% of its capital stock depreciates every year.

7. *Ceteris paribus*, what will the growth rate in this country be over the next year?

(a) -3.96%

(b) 10%

(c) 2.4%

(d) -4.13%

Solution: $y = \sqrt{900} = 30 \Rightarrow i = 30 - 10 = 20$. $d = 900(.10) = 90$. Capital next year = capital today + investment - depreciation = 900 + 20 - 90 = 830 $\Rightarrow$ output next year = $\sqrt{830} = 28.81$ $\Rightarrow \hat{y} = (28.81 - 30)/30 = -3.96\%$.

8. If instead, the country had 20% of its capital stock depreciate every year, what will its level of capital per worker be next year?

(a) 920 units

(b) 720 units

(c) 900 units

(d) 740 units

Solution: $d = .20(900) = 180$. $k_1 = 900 + 20 - 180 = 740$.

9. Figure 2 shows the production, investment, and depreciation functions of Iceland.

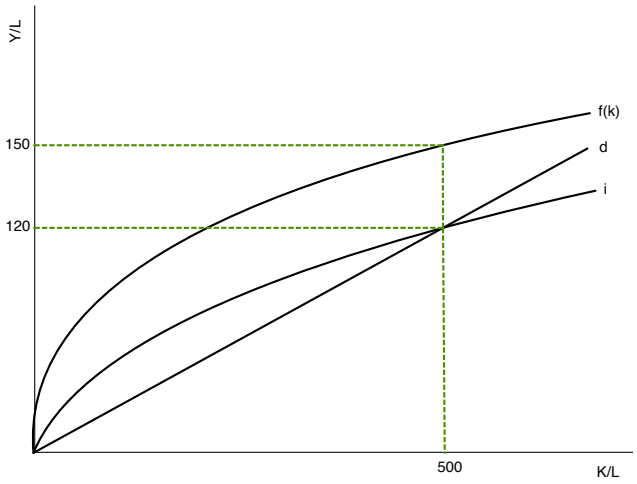


Figure 2: Production in Iceland

The amount of capital per worker that depreciates each period in the steady state is _____and the percent of output per worker that is consumed in the steady state is _____.

(a) 500; 80%

(b) 120; 20%

(c) 500; 20%

(d) 120; 80%

Solution: Steady state where $i = d$. Steady state level of capital is 500, investment is 120, output is 150, and consumption is $150 - 120 = 30$. $d^* = i^* = 120$. Percent of output consumed $= 30/150 = 20\%$.

10. An economy has the production function $y = \sqrt{k}$. If the savings rate is 30%, the depreciation rate is 3%, and population growth is zero, then the steady state level of consumption per worker is

(a) 10.

(b) 3.

(c) 7.

(d) 5.

11. Suppose a country has the production function $y = 5\sqrt{k}$. Capital depreciates at rate $\delta = 4\%$. Moreover, the labor force in the country is very elderly, and as a result the country's workforce decreases by 2% every period. Use this information and Table 1 to answer the questions that follow.

Table 1: Solow Growth

t	k_t	y_t	d_t	i_t	$\hat{y}_t$
0	**1,600**	**200**	32	32	—
1	**1,600**	**200**	**32**	**32**	**0%**
.					
.					
.					
5	**1,600**	**200**	**32**	**32**	**0%**
6	**1,600**	**200**	**32**	**32**	$x =$ **0%**
7	**1,600**	**200**	**32**	**40**	
8	**1,608**	**200.499**			$z =$ **.2495%**

(a) If the country is currently in period $t = 0$, do you expect capital to accumulate, decumulate, or neither in the next period? Explain why.

Solution: Neither. Since $i = d$, the country is at its steady state in period 0 and so capital will not change in the next period.

(b) What is the level of capital and output per worker in this period ($t = 0$)?

Solution: $d_t = (n + \delta)k_t = ((-.02) + .04)k_t = .02k_t$. $d_0 = 32 \Rightarrow k_0 = 32/.02 = 1,600$. $y_0 = 5\sqrt{1,600} = 200$.

(c) What is the savings rate in this country?

Solution: $i_t = sy_t = s(200)$. $i_0 = 32 \Rightarrow s = 32/200 = 16\%$.

(d) Assuming everything remains the same, what is the growth rate of output per worker in period $t = 6$ (i.e., what is x)?

Solution: Since the country is at its steady state, the growth rate of output per worker will be 0% in every period unless A, s, n, or δ change.

(e) At the beginning of period $t = 7$, the country changes its saving rate to 20%. What is the growth rate of output per worker in period $t = 8$ (i.e., what is z)?

Solution: Since the country was at its steady state at the start of period 7, $k_7 = 1,600$ and $y_7 = 200$. Depreciation for the period remains $d_7 = 32$, but now $i_7 = .20(200) = 40$ since $s = 20\%$. Capital at the start of period 308: $k_8 = k_7 + i_7 - d_7 = 1,600 + 40 - 32 = 1,608$. $y_8 = 5\sqrt{1,608} = 200.499$. Growth rate of output: $\widehat{y_8} = (200.499 - 200)/200 = .2495\%$.

(f) Draw the effect of this change in the savings rate on a well-labeled graph. You do not need to write the specific numbers down, but clearly show the steady state levels of capital, output, investment, and consumption per worker before and after the change.

Solution: See class notes. The graph should depict an increase in the savings rate, which shifts the investment function up. k^*, i^*, and y^* all increase. The effect on c^* is ambiguous.

12. A country has the production function $F(K, L) = AK^{\beta}L^{1-\beta}$, where $0 < \beta < 1$, K represents the country's capital stock, and L represents its labor force.

(a) Show that doubling both inputs will double the output the country can produce (i.e., $F(2K, 2L) = 2F(K, L)$). What is this property called?[1]

[1] **Hint:** A couple of properties of exponents are that $x^a \cdot x^{1-a} = x^{(a+1-a)}$ and $(xy)^a = x^a \cdot y^a$.

Solution: $F(2K, 2L) = A(2K)^{\beta}(2L)^{1-\beta} = A(2)^{\beta}(2)^{1-\beta}K^{\beta}L^{1-\beta} = 2^{\beta+1-\beta}AK^{\beta}L^{1-\beta} = 2(AK^{\beta}L^{1-\beta}) = 2F(K, L)$. This production function exhibits constant returns to scale.

(b) Define $k = K/L$ as the capital-labor ratio and write output per worker as $f(k) = Ak^{\beta}$. Suppose $A = 4$ and $\beta = 1/2$. What is the marginal product of capital per worker for the first unit of capital? The second? Third? What property does this show?

Solution: $Y/L = (1/L)F(K, L) = F(K/L, L/L) = Ak^{\beta} \equiv f(k)$. Plugging in $A = 4$ and $\beta = 1/2$, $f(k) = 4\sqrt{k}$.
$f(0) = 4\sqrt{0} = 0$.
$f(1) = 4\sqrt{1} = 4$. $MP_k = 4 - 0 = 4$.
$f(2) = 4\sqrt{2} = 5.66$. $MP_k = 5.66 - 4 = 1.66$.
$f(3) = 4\sqrt{3} = 6.93$. $MP_k = 6.93 - 5.66 = 1.27$.
This production function exhibits diminishing marginal returns to capital.

(c) The capital stock in this country depreciates at rate $\delta = 3\%$, output is invested at rate $s = 15\%$, and the labor force grows at rate $n = 2\%$. It currently has a capital stock per worker of $k_0 = 100$. How much, if any, capital per worker do you expect the country to accumulate (or decumulate) once it reaches its steady state?

Solution: $i = sy = .15(4\sqrt{k}) = .6\sqrt{k}$. $d = (n + \delta)k = (.02 + .03)k = .05k$. SS: $.6\sqrt{k} = .05k \Rightarrow (.6)^2(\sqrt{k})^2 = (.05)^2k^2 \Rightarrow .36k = .0025k^2 \Rightarrow k^* = (.36/.0025) = 144$. Since capital is currently 100, we expect 44 units of capital to accumulate.

(d) What is the steady state level of output, investment, and consumption in this country?

Solution: $y* = f(k^*) = 4\sqrt{144} = 48$.
$i^* = sy^* = .15(48) = 7.2$
$c^* = (1 - s)y^* = y^* - i^* = 40.8$.

Savings, Investment, and the Financial System

1. A closed economy has income of \$1,000, government spending of \$200, taxes of \$150, and investment of \$250. What is private saving?

   (a) \$100

   (b) \$200

   (c) \$300

   (d) \$400

   Solution: National saving = National investment. $Y - C - G = I \Rightarrow 1000 - C - 200 = 250 \Rightarrow C = \$550$. Private saving $= Y - T - C = 1000 - 150 - 550 = \$300$.

2. Acme, LLC is considering purchasing a new factory. If the interest rate falls, then the present value of the returns from the factory will _____, and the company will be _____likely to build the factory.

   (a) increase; less

   (b) decrease; more

   (c) increase; more

(d) decrease; less

Solution: If the interest rate falls, then the cost of borrowing will decrease and so the present value of the returns increases. This will make the company more likely to build the factory.

3. If the business community becomes more optimistic about the profitability of capital, the _____for loanable funds would shift, driving the equilibrium interest rate _____.

   (a) supply; up

   (b) supply; down

   (c) demand; up

   (d) demand; down

   Solution: Demand for loanable funds will increase, which will increase the equilibrium interest rate and quantity of loanable funds.

4. Savings is

   (a) the purchase of new capital goods.

   (b) the purchase of new consumption goods.

   (c) income that is not spent on capital goods.

   (d) income that is not spent on consumption goods.

5. What effect will an investment tax credit have on interest rates and the quantity of savings?

   (a) Both interest rates and the quantity of savings will decrease.

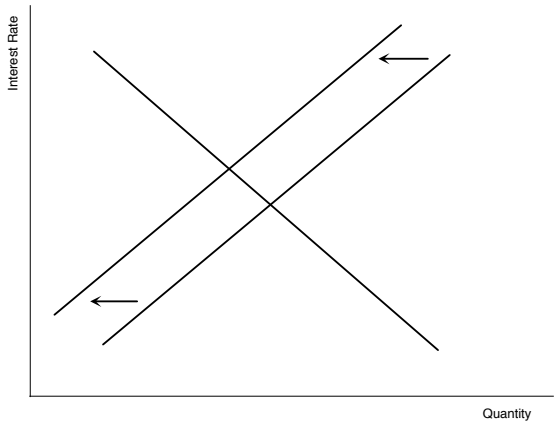
   (b) Interest rates will increase, and the quantity of savings will decrease.

   (c) Both interest rates and the quantity of saving will increase.

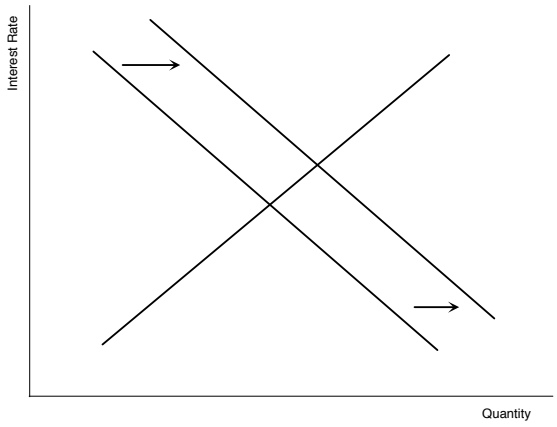
   (d) Interest rates will decrease, and the quantity of savings will increase.

   Solution: An investment tax credit will increase the demand for loanable funds. This will increase both the equilibrium interest rate and quantity of loanable funds.

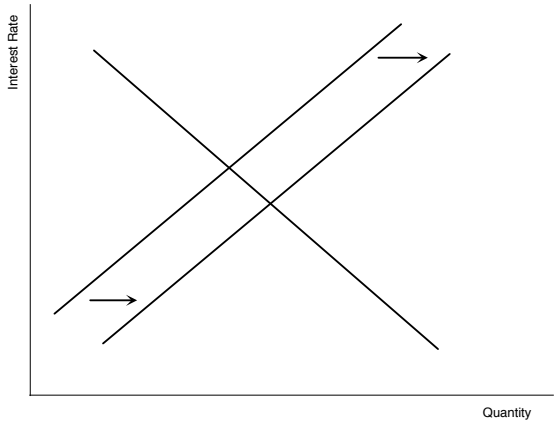
6. Which of the following graphs of the loanable funds market correctly shows the effect of the imposition of a consumption tax?



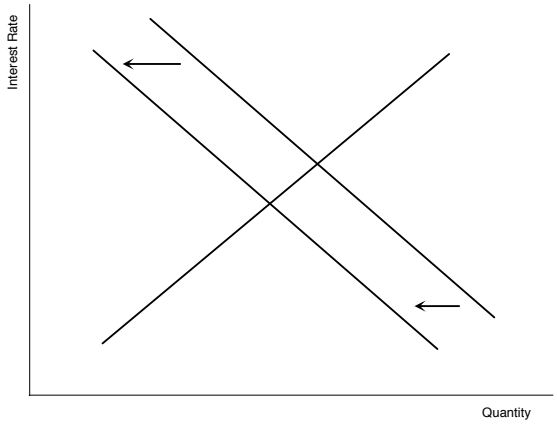
(a)



(b)



(c)



(d)

Solution: A tax on consumption provides an incentive for people to save more (since we assume you can either spend your income on savings or consumption) and so the supply of loanable funds will increase. Option (c) shows this shift.

7. Always On Time Airlines is considering purchasing a new jet. The company would be *less* likely to purchase a new jet if either
   (a) the price of a new jet decreased or the interest rate decreased.
   (b) the price of a new jet increased or the interest rate decreased.
   (c) the price of a new jet decreased or the interest rate increased.
   (d) the price of a new jet increased or the interest rate increased.

   Solution: The cost of borrowing increases if the price of the jet increases or interest rates increase.

8. Suppose you currently hold a bond that promises to pay \$100 in a year, \$100 in two years, and \$1,100 in three years. If you wish to sell the bond today in order to buy a new bicycle, which of the following market interest rates would allow you to sell the bond for the highest price?

(a) 7%

(b) 10%

(c) 5%

(d) 8%

Solution: The price of a bond is inversely related to market interest rates.

9. Assuming the supply of loanable funds is made up of national savings, which of the following would be the most likely to cause an increase in the demand for loanable funds?

   (a) A decrease in the interest rate.

   (b) An increase in savings.

   (c) A decrease in consumption.

   (d) An increase in government borrowing.

   (e) None of the above.

10. Figure 4 shows the market for loanable funds.

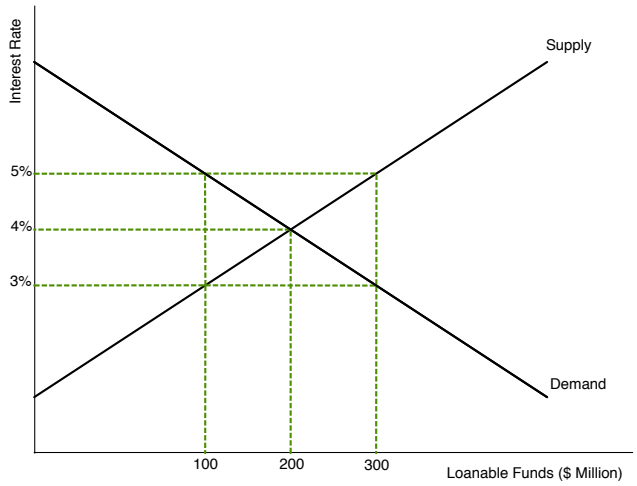


Figure 4: Market for Loanable Funds

If the interest rate in the market is 3%, then

   (a) investment exceeds savings by $300 million.

   (b) investment exceeds savings by $200 million.

   (c) borrowing demands exceed savings by $300 million.

   (d) borrowing demands exceed savings by $200 million.

Solution: (b) - (d) all affect the supply of loanable funds, while (a) causes a movement along the curves.

11. National saving is equal to

(a) private saving + public saving.

(b) investment + consumption expenditures.

(c) GDP - government purchases.

(d) GDP + consumption expenditures + government purchases.

(e) none of the above.

12. If the public consumes $100 billion less and the government purchases $100 billion more (other things unchanging), which of the following is true?

(a) There is an increase in savings, and the economy should grow more quickly.

(b) There is a decrease in savings, and the economy should grow more quickly.

(c) Savings is unchanged.

(d) There is not information to determine what will happen to savings.

13. An increase in the budget deficit that causes the government to increase its borrowing

(a) shifts demand for loanable funds to the right.

(b) shifts the demand for loanable funds to the left.

(c) shifts the supply of loanable funds to the left.

(d) shifts the supply of loanable funds to the right.

14. An increase in the budget deficit is

(a) a decrease in public saving.

(b) an increase in public saving.

(c) a decrease in private saving.

(d) an increase in private saving.

(e) none of the above.

15. If an increase in the budget deficit reduces national saving and investment, we have witnessed a demonstration of

(a) equity finance.

(b) the mutual fund effect.

(c) intermediation.

(d) crowding out.

16. Three students have each saved $500. Each has an investment opportunity in which he or she can invest up to $1,000. The rates of return on the investment projects are as follows:

Table 2: Rates of Return

Student	Rate of Return (r)
Natalie	5%
Isabella	8%
Noah	15%

(a) Suppose their school opens a market for loanable funds in which students can lend and borrow among themselves at interest rate i. What would determine whether a student would choose to be a borrower or a lender in this market?

Solution: If $i > r$, the student would rather lend since they would get a higher return on a loan than on their investment. If $i < r$, the student would rather borrow.

(b) Among these three students, what would be the quantity of loanable funds supplied and quantity demanded at an interest rate of 7%? At 10%?

Solution: At $i = 7\%$, Natalie would be a lender while Isabella and Noah would be borrowers. $Q_s = \$500$, $Q_d = \$1{,}000$. At $i = 10\%$, Natalie and Isabella would be lenders while Noah would a be borrower. $Q_s = \$1{,}000$, $Q_d = \$500$.

(c) At what interest rate would the loanable funds market among these students be in equilibrium? Which student(s) would be borrowers and which would be lenders?

Solution: $i^* = 8\%$. Natalie would lend \$500 (Q_s), Noah would borrow \$500 (Q_d, and Isabella uses her own funds to invest and would neither borrow or lend.

(d) At this equilibrium interest rate, how much does each student have a year later after the investment projects pay their returns and loans have been repaid?

Solution: Isabella invests \$500 and gets an 8% return: \$500(1.08) = \$540.
Natalie lends \$500 and gets 8% interest: \$500(1.08) = \$540.
Noah borrows \$500 at 8% and invests \$1,000 with a 15% return: \$1,000(1.15) - \$500(1.08) = \$610.

Unemployment

1. Other things the same, an increase in the minimum wage
   (a) increases frictional unemployment but leaves the natural rate of unemployment unchanged.
   (b) increases frictional unemployment and increases the natural rate of unemployment.
   (c) increases structural unemployment but leaves the natural rate of unemployment unchanged.
   (d) increases structural unemployment and increases the natural rate of unemployment.

   Solution: The minimum wage would increase structural unemployment, which in turn would increase the natural rate of unemployment.

2. If an unemployed person quits looking for work, then eventually the unemployment rate will _____and the labor force participation rate will _____.
   (a) decrease; remain the same
   (b) decrease; decrease
   (c) remain the same; decrease
   (d) remain the same; remain the same

Solution: The discouraged worker would no longer be counted as unemployed or as in the labor force, so both the unemployment rate and LFPR would decrease.

3. The actual unemployment rate varies around the
   (a) frictional unemployment rate.
   (b) structural unemployment rate.
   (c) cyclical unemployment rate.
   (d) natural unemployment rate.

4. Natalie just graduated from college. In order to devote all her efforts towards her education, she didn't hold a job while in school. Now, she is going to cruise around the country on her motorcycle for awhile before she starts looking for work. As a result, the unemployment rate
   (a) increases, and the labor-force participation rate increases.
   (b) is unaffected, and the labor-force participation rate is unaffected.
   (c) increases, and the labor-force participation rate decreases.
   (d) increases, and the labor-force participation rate is unaffected.

   Solution: Natalie was not in the labor force as a student, and will still not be in the labor force while she is not looking for a job. Thus, neither the unemployment rate or LFPR are affected.

5. John Doe looked for a new job for two months when he and his family moved to South Florida, but stopped looking for work six weeks ago because his wife landed a prominent position at the University of Miami. As of right now, John is considered _____ by the BLS.
   (a) frictionally unemployed.
   (b) structurally unemployed.
   (c) cyclically unemployed.
   (d) not in the labor force.

   Solution: John has not actively sought work in the last 4 weeks, so he would not be included in the labor force.

6. Consider Table 3, which shows the people in country Y that are structurally unemployed, cyclically unemployed, and frictionally unemployed.

Table 3: Unemployment Statistics for Country Y

Type of Unemployment	Number Unemployed
Structural	14 million
Cyclical	8 million
Frictional	10 million

Additionally, there are 300 million people employed and 350 million adults in the country. What is the natural unemployment rate?

(a) 7.2%

(b) 8.0%

(c) 9.1%

(d) 9.6%

Solution: Natural unemployment rate = (structural + frictional unemployment)/(Labor force) = (14 + 10)/(300+14+8+10) = 7.2%.

7. Suppose an economy has 139.2 million adults that are employed, 14.5 million that are unemployed, and 85.2 million that are not in the work force. Given this information, what is the unemployment rate?

   (a) 6.1%

   (b) 9.4%

   (c) 10.4%

   (d) 8.7%

   Solution: Unemployment rate = #unemployed/labor force = 14.5/(139.2+14.5) = 9.4%.

8. Frictional unemployment is best defined as

   (a) long-term unemployment caused by changing features of an economy.

   (b) short-term unemployment caused by difficulties of matching employees to employers.

   (c) unemployment caused by cyclical conditions of an economy.

   (d) a normal level of unemployment caused by high wages.

9. The amount of unemployment that the economy normally experiences is known as

   (a) efficiency wage unemployment.

   (b) frictional unemployment.

   (c) cyclical unemployment.

   (d) the natural rate of unemployment.

10. A minimum-wage law tends to

    (a) create more unemployment in high-skill job markets than in low-skill job markets.

    (b) create more unemployment in low-skill job markets than in high-skill job markets.

    (c) have no impact on unemployment as long as it is set above the competitive minimum wage.

    (d) create the same amount of unemployment in high-skill job markets as in low-skill job markets.

Refer to Table 4 to answer questions 11-13.

Table 4: Labor Statistics

Total Population	195.4 million
Adult Population	139.7 million
Number unemployed	5.7 million
Number employed	92.3 million

11. The labor force in this country is
    (a) 92.3 million.
    (b) 98.0 million.
    (c) 134.0 million.
    (d) 139.7 million.

    Solution: Labor force = #E + #U = 98 million.

12. The unemployment rate is
    (a) 3.2%.
    (b) 5.7%
    (c) 5.8%.
    (d) 6.2%.

    Solution: Unemployment rate = #U/LF = 5.7/98 = 5.8%.

13. The labor force participation rate is
    (a) 47.1%.
    (b) 50.2%.
    (c) 65.9%.
    (d) 70.2%.

    Solution: LFPR = LF/Adult pop = 98/139.7 = 70.2%.

14. According to the Bureau of Labor Statistics, a husband who chooses to stay home and take care of the household is
    (a) unemployed.
    (b) employed.
    (c) not in the labor force.
    (d) a discouraged worker.

15. An accountant with a CPA designation that has been unable to find work so long that she has stopped looking for work is considered to be

(a) employed.

(b) unemployed.

(c) not in the labor force.

(d) not in the adult population.