

## MACROECON 2105: ANSWER-KEY

### Chapter 8: 1,5,11, &14

1. Economic growth means a higher standard of living, provided population does not grow even faster. And if it does, then economic growth is even more important to maintain the current standard of living. Economic growth allows the lessening of poverty even without an outright redistribution of wealth.

If population is growing at 2.5 percent a year—and it is in some of the poorest nations—then a 2.5 percent growth rate of real GDP means no change in living standards. A 3.0 percent growth rate means a gradual rise in living standards. For a wealthy nation, such as the United States, with a GDP in the neighborhood of \$10 trillion, the 0.5 percentage point difference between 2.5 and 3.0 percent amounts to \$50 billion a year, or more than \$150 per person per year.

Using the “Rule of 70,” it would take 28 years for output to double with a 2.5 percent growth rate, and just over 23 years with 3.0 percent growth.

5. The four supply factors are the quantity and quality of natural resources; the quantity and quality of human resources; the stock of capital goods; and the level of technology. The demand factor is the level of purchases needed to maintain full employment. The efficiency factor refers to both productive and allocative efficiency. Figure 8.2 illustrates these growth factors by showing movement from curve AB to curve CD.

**11.** The rate of productivity growth has grown substantially due to innovations using microchips, computers, new telecommunications devices and the Internet. All of these innovations describe features of what we call information technology, which connects information in all parts of the world with information seekers. New information products are often digital in nature and can be easily replicated once they have been developed. The start-up cost of new firms and new technology is high, but expanding production has a very low marginal cost, which leads to economies of scale – firms’ output grows faster than their inputs. Network effects refer to a type of economy of scale whereby certain information products become more valuable to each user as the number of buyers grows. For example, a fax machine is more useful to you when lots of other people and firms have one; the same is true for compatible word-processing programs. Global competition is a feature of the New Economy because both transportation and communication can be accomplished at much lower cost and faster speed than previously which expands market possibilities for both consumers and producers who are not very limited by national boundaries today.

14. Over the past 25 years U.S. real GDP has grown about 3 percent per year; China’s real GDP has grown about 9 percent per year. China’s annual income per capita is around \$2500. China’s coastal areas are more industrialized, with greater access to international markets. Some of these areas have been designated “special economic zones,” with greater freedom and support to engage in high productivity economic activity. The poorer interior regions are heavily agricultural.

## Chapter 9: 1,7, & 11

1. The four phases of a typical business cycle, starting at the bottom, are trough, recovery, peak, and recession. As seen in Table 9.1, the length of a complete cycle varies from about 2 to 3 years to as long as 15 years.

There is a pre-Christmas spurt in production and sales and a January slackening. This normal seasonal variation does not signal boom or recession. From decade to decade, the long-term trend (the secular trend) of the U.S. economy has been upward. A period of no GDP growth thus does not mean all is normal, but that the economy is operating below its trend growth of output.

Because capital goods and durable goods last, purchases can be postponed. This may happen when a recession is forecast. Capital and durable goods industries therefore suffer large output declines during recessions. In contrast, consumers cannot long postpone the buying of nondurables such as food; therefore recessions only slightly reduce non-durable output. Also, capital and durable goods expenditures tend to be “lumpy.” Usually, a large expenditure is needed to purchase them, and this shrinks to zero after purchase is made.

7. The CPI is constructed from a “market basket” sampling of goods that consumers typically purchase. Prices for goods in the market basket are collected each month, weighted by the importance of the good in the basket (cars are more expensive than bread, but we buy a lot more bread), and averaged to form the price level.

To calculate the rate of inflation for year 5, the BLS subtracts the CPI of year 4 from the CPI of year 5, and then divides by the CPI of year 4 (percentage change in the price level).

Inflation reduces the purchasing power of the dollar. Facing higher prices with a given number of dollars means that each dollar buys less than it did before.

The rate of inflation in the CPI approximates the difference between the nominal and real interest rates. A nominal interest rate of 10% with a 6% inflation rate will mean that real interest rates are approximately 4%.

Deflation means that the price level is falling, whereas with inflation overall prices are rising. Deflation is undesirable because the falling prices mean that incomes are also falling, which reduces spending, output, employment, and, in turn, the price level (a downward spiral). Inflation in modest amounts (<3%) is tolerable, although there is not universal agreement on this point.

11. (a) Assuming the pensioned railway worker has no other income and that the pension is not indexed against inflation, the retired worker’s real income would decrease every year by approximately 10 percent of its former value.
- (b) Assuming the clerk was unionized and the contract had over a year to run, the clerk’s real income would decrease in the same manner as the pensioner. However, the clerk could expect to recoup at least part of the loss at contract renewal time. In the more likely event of the clerk not being unionized, the clerk’s real income would decrease, possibly by as much as the pensioned railroad worker. Although with prices increasing, the store hiring the clerk may be able to pay the clerk better (and need to in order to retain his or her services).
- (c) Since the UAW worker is unionized, the loss in the first year would be the same as in (b) but it is likely—barring a deep recession—that the loss will be made up at contract renewal time plus the usual real increase that may or may not be related to increased productivity. If the contract had a cost-of-living allowance clause in it, the wage would automatically be raised at the end of the year to cover the loss in purchasing power. Next year’s wage would rise by 10 percent.
- (d) If the inflation is also in the price the farmer gets for his products, he could gain. But more likely the price increases are mostly in what he buys, since farm machinery, fertilizer, etc.,

- tend to be sold by less competitive sellers with more power to raise their prices. The farmer faces a lot of competition and has to rely on the market price to go up—the farmer has little control over prices on an individual basis. Moreover, if interest rates on the farmer's new debts have gone up with the prices, the farmer could be even worse off. The other side of the coin is that if no new borrowing is necessary, the inflation will reduce the real burden of the farmer's debt, because the purchasing power declines on the fixed payments he contracted to make before inflation.
- (e) The retired executive is in the same boat as the pensioned railroad worker, except that the executive's income from the bonds or other interest bearing assets is probably greater than that of the worker from the pension. The increase in inflation has most probably been accompanied by rising interest rates, with a proportional drop in the price of bonds. Therefore, the retired executive would suffer a capital loss if he or she decided to cash in some of the bonds at this time and the fixed interest received on these existing bonds is worth less in terms of purchasing power. In other words, the executive, although wealthier than the retired worker, may be affected just as much or more from inflation.
  - (f) Assuming the store owner's prices and revenues have been keeping pace with inflation, his or her real income will not change unless the costs have risen more than the product prices.

**Chapter 10: 3,6, & 12**

**3.**

- (a) If this simply means households have become more wealthy, then consumption will increase at each income level. The consumption schedule should shift upward and the saving schedule shift downward. The investment schedule may shift rightward if owners of existing homes sell them and invest in construction of new homes more than previously.
- (b) The decline in the real interest rate will increase interest-sensitive consumer spending; the consumption schedule will shift up and the saving schedule down. Investors will increase investment as they move down the investment-demand curve; the investment schedule will shift upward.
- (c) A sharp decline in stock prices can be expected to decrease consumer spending because of the decrease in wealth; the consumption schedule shifts down and the saving schedule upwards. Because of the depressed share prices and the number of speculators forced out of the market, it will be harder to float new issues on the stock market. Therefore, the investment schedule will shift downward.
- (d) The increase in the rate of population growth will, over time, increase the rate of income growth. In itself this will not shift any of the schedules but will lead to movement upward to the right along the upward sloping investment schedule.
- (e) This innovation will in itself shift the investment schedule upward. Also, as the innovation starts to lower the costs of producing everything using these chips, prices will decrease leading to increased quantities demanded. This, again, could shift the investment schedule upward.
- (f) The postponement of benefits may cause households to save more if they planned to retire before they qualify for benefits; the saving schedule will shift upward, the consumption schedule downward. This impact is uncertain, however, if people continue to work and earn productive incomes.

- (g) Because this reduces disposable income, consumption will decline in proportion to the marginal propensity to consume. Consumption will be less at each level of real output, and so the curve shifts down. The saving schedule will also fall because the disposable income has decreased at each level of output, so less would be saved.
6. The basic determinants of investment are the expected rate of return (net profit) that businesses hope to realize from investment spending, and the real rate of interest.

When the real interest rate rises, investment decreases; and when the real interest rate drops, investment increases—other things equal in both cases. The reason for this relationship is that it makes sense to borrow money at, say, 10 percent, if the expected rate of net profit is higher than 10 percent, for then one makes a profit on the borrowed money. But if the expected rate of net profit is less than 10 percent, borrowing the money would be expected to result in a negative rate of return on the borrowed money. Even if the firm has money of its own to invest, the principle still holds: The firm would not be maximizing profit if it used its own money to carry out an investment returning, say, 9 percent when it could lend the money at an interest rate of 10 percent.

Investment is unstable because, unlike most consumption, it can be put off. In good times, with demand strong and rising, businesses will bring in more machines and replace old ones. In times of economic downturn, no new machines will be ordered. A firm can continue for years with, say, a tenth of the investment it was carrying out in the boom. Very few families could cut their consumption so drastically.

New business ideas and the innovations that spring from them do not come at a constant rate. This is another reason for the irregularity of investment. Profits and the expectations of profits also vary. Since profits, in the absence of easy access to borrowed money, are essential for investment and since, moreover, the object of investment is to make a profit, investment, too, must vary.

As long as expected rates of return rise faster than real interest rates, investment spending may increase. This is most likely to occur during periods of economic expansion.

12. (a) MPC is .8  
 (b) MPS is  $(1 - .8) = .2$   
 (c)  $C = \$40 + .8(\$400) = \$40 + \$320 = \$360$   
 (d)  $APC = \$360 / \$400 = .9$   
 (e)  $S = Y - C = \$400 - \$360 = \$40$   
 (f)  $APS = \$40 / \$400 = .1$  or  $1 - APC$

### Chapter 11: 2, 8, 12 & 13

2. Saving data for completing the table (top to bottom): -\$4; \$0; \$4; \$8; \$12; \$16; \$20; \$24; \$28.

Equilibrium GDP = \$340 billion, determined where (1) aggregate expenditures equal GDP (C of \$324 billion + I of \$16 billion = GDP of \$340 billion); or (2) where planned  $I = S$  (I of \$16 billion = S of \$16 billion). Equilibrium level of employment = 65 million; MPC = .8; MPS = .2.

8. The multiplier is 10 or  $1/(1 - .9)$  so  $10 \times -\$4 \text{ billion} = -\$40 \text{ billion}$ . The new GDP is \$400 billion - \$40 billion = \$360 billion.

- 12.** Before  $G$  is added, open private sector equilibrium will be at \$350. The addition of government expenditures of  $G$  to our analysis raises the aggregate expenditures ( $C + I_g + X_n + G$ ) schedule and increases the equilibrium level of GDP as would an increase in  $C$ ,  $I_g$ , or  $X_n$ . Note that changes in government spending are subject to the multiplier effect. Government spending supplements private investment and export spending ( $I_g + X + G$ ), increasing the equilibrium GDP to \$450. The addition of \$20 billion of government expenditures and \$20 billion of personal taxes increases equilibrium GDP from \$350 to \$370 billion. The \$20 billion increase in  $G$  raises equilibrium GDP by \$100 billion ( $= \$20 \text{ billion} \times \text{the multiplier of } 5$ ); the \$20 billion increase in  $T$  reduces consumption by \$16 billion at every level. ( $= \$20 \text{ billion} \times \text{the MPC of } .8$ ). This \$16 billion decline in turn reduces equilibrium GDP by \$80 billion ( $\$16 \text{ billion} \times \text{multiplier of } 5$ ). The net change from including balanced government spending and taxes is \$20 billion ( $= \$100 \text{ billion} - \$80 \text{ billion}$ ).
- 13.** (a) A recessionary gap. Equilibrium GDP is \$600 billion, while full employment GDP is \$700 billion. Employment will be 20 million less than at full employment. Aggregate expenditures would have to increase by \$20 billion ( $= \$700 \text{ billion} - \$680 \text{ billion}$ ) at each level of GDP to eliminate the recessionary gap. The MPC is .8, so the multiplier is 5.
- (b) An inflationary gap. Aggregate expenditures will be excessive, causing demand-pull inflation. Aggregate expenditures would have to *fall* by \$20 billion ( $= \$520 \text{ billion} - \$500 \text{ billion}$ ) at each level of GDP to eliminate the inflationary gap. The multiplier is still 5 – the level of full employment GDP does not affect the multiplier.
- (c)  $\text{MPC} = .8$  ( $= \$40 \text{ billion} / \$50 \text{ billion}$ );  $\text{MPS} = .2$  ( $= 1 - .8$ ); multiplier = 5 ( $= 1 / .2$ ).