

CB2402 Macroeconomics

Problem Set I

Chapters 19 - 20

Answer the next FOUR questions by browsing the website of the Hong Kong Census and Statistics Department <https://www.censtatd.gov.hk/home/>

1). What is Hong Kong's current unemployment rate (as of 2018Q4, seasonally adjusted)?

- A) 5.2%
- B) 4.5%
- C) 3.4%
- D) 2.8%

Answer: D

2). What is Hong Kong's labor force participation rate as of 2018Q4?

- A) 55.4%
- B) 60.9%
- C) 61.4%
- D) 68.2%

Answer: B

3). What is Hong Kong's per capita real GDP (in chained 2016 HK\$) as of 2017?

- A) \$349,745
- B) \$359,996
- C) \$725,981
- D) \$676,112

Answer: A

4). As of 2018Q3, Hong Kong's GDP deflator is _____ from which we can infer that the general price level has gone up by about _____ from 2016 – 2018.

- A) 100; 3.7%
- B) 107.4; 7.4%
- C) 104.3; 4.3%
- D) 98.4; -2%

Answer: B

5). Suppose that a simple economy produces only four goods and services: sweatshirts, dental examinations, coffee drinks, and coffee beans. Assume all of the coffee beans are used in the production of the coffee drinks.

Product	Quantity	Price
Sweatshirts	50	\$35.00
Dental examinations	40	75.00
Coffee drinks	1,000	4.00
Coffee beans	2,000	0.50

Using the information in the table, nominal GDP for this simple economy equals

- A) 3,090 units.
- B) \$7,250.
- C) \$8,750.
- D) \$9,750.

Answer: C

Coffee beans are intermediate goods in this example. They must be excluded in GDP calculation to avoid double-counting. $\text{Nominal GDP} = (50)(35) + (40)(75) + (1000)(4) = 8750$. See textbook p.692, Solved Problem 19.1.

6). The purchase by a household in China of a CD produced in the United States is included in U.S.

- A) consumption expenditures.
- B) investment expenditures.
- C) government purchases.
- D) net exports.

Answer: D

7). In 2016, Kendall Ford, an automobile dealership, spent \$20,000 on a new car lift for its repair shop, \$2,000 on a new copy machine for its sales division, and \$600,000 on Ford Motor company stock. Unsold cars and trucks were valued at \$400,000 on January 1, 2016 and unsold cars and trucks were valued at \$900,000 on December 31, 2016. What is Kendall Ford's total investment spending in 2016?

- A) \$22,000
- B) \$322,000
- C) \$522,000
- D) \$1,022,000

Answer: C

In macroeconomics, investment means spending by firms on new factories, office buildings, machinery, and additions to inventories, plus spending by households and firms on new houses. See the box-case “Remember what economists mean by investment” (textbook, p.695). Purchases of company stock is NOT included in investment spending. The investment spending of Kendall Ford = $\$20,000 + 2,000 + (900,000 - 400,000) = \$522,000$.

Answer the next THREE questions based on the following table.

Working-age population	?
Employment	?
Unemployment	7,296
Unemployment rate	?
Labor force	135,113
Labor force participation rate	67.0%

8). Working-age population equals

- A) 201,661
- B) 312,500
- C) 451,992
- D) 590,205

Answer: A

9). The unemployment rate is about

- A) 4.4%
- B) 5.4%
- C) 6.4%
- D) 7.4%

Answer: B

10). The employment-population ratio is about

- A) 33.4%
- B) 43.4%
- C) 53.4%
- D) 63.4%

Answer: D

Detailed answer for Q8 – Q10

Working-age population	201,661
Employment	127,817
Unemployment	7,296
Unemployment rate	5.4%
Labor force	135,113
Labor force participation rate	67.0%

$$\text{Unemployment rate} = \frac{\text{Unemployed}}{\text{Labor force}} \times 100.$$

$$\text{Unemployed} = (\text{Labor force} \times \text{Unemployment rate})/100 = (135,113 \times 5.4)/100 = 7,296$$

$$\text{Labor force} = \text{Employed} + \text{Unemployed}$$

$$\text{Employed} = \text{Labor Force} - \text{Unemployed}$$

$$\text{Employed} = 135,113 - 7,296 = 127,817$$

$$\text{Labor force participation rate} = \frac{\text{Labor force}}{\text{Working-age population}} \times 100.$$

$$\text{Working-age population} = (\text{Labor force} / \text{Labor force participation rate}) \times 100$$

$$\text{Working-age population} = (135,113 / 67) \times 100 = 201,661$$

11). If prices are rising on average, then

- A) real GDP will always be equal to nominal GDP.
- B) real GDP will be greater than nominal GDP in the years after the base year.
- C) real GDP will be less than nominal GDP in the years before the base year.
- D) real GDP will be greater than nominal GDP in the years before the base year.

Answer: D

See textbook p.703, Figure 19.3. In the textbook example, the base year is 2009 and thus “the years before the base year” means 2008, 2007, 2006,... To see why real GDP before the base year should be higher than nominal GDP, consider for example the real GDP and nominal GDP of 2000:

$$(1) \text{ Real GDP } 2000 = P_{2009}^1 Q_{2000}^1 + P_{2009}^2 Q_{2000}^2 + P_{2009}^3 Q_{2000}^3 + \dots$$

$$(2) \text{ Nominal GDP } 2000 = P_{2000}^1 Q_{2000}^1 + P_{2000}^2 Q_{2000}^2 + P_{2000}^3 Q_{2000}^3 + \dots$$

Notice the usage of 2009 prices in calculating the real GDP of 2000. (1) > (2) because

$P_{2009}^1 > P_{2000}^1$, $P_{2009}^2 > P_{2000}^2$, $P_{2009}^3 > P_{2000}^3$, ... as assumed in this question (“prices are rising on average”).

12). GDP is *not* a perfect measure of well-being because

- A) the value of leisure is included in GDP.
- B) GDP is not adjusted for pollution.
- C) GDP is adjusted for changes in crime rates.
- D) GDP is adjusted for increases in drug addiction.

Answer: B

13). In 2015, JP Morgan Chase announced that it was laying off 5,000 employees. The laid-off employees who were not able to find jobs at another bank due to a permanent decline in demand in the banking industry would be considered _____, and this _____.

- A) structurally unemployed; is included in the natural rate of unemployment
- B) structurally unemployed ; is not included in the natural rate of unemployment.
- C) frictionally unemployed ; is not included in the natural rate of unemployment
- D) frictionally unemployed; is included the natural rate of unemployment.

Answer: A

Textbook p.727, “Full employment”.

Natural rate of unemployment = frictional unemployment + structural unemployment.

- 14). Which of the following explains why many European countries have unemployment rates that are higher than in the United States?
- A) Technological change occurs at a faster rate in Europe, so structural unemployment is higher in Europe.
- B) European countries offer higher unemployment benefits than the United States.
- C) Firms in European countries offer employees higher wages and higher benefits than do firms in the United States.
- D) The minimum wage in Europe is lower than it is in the United States.
- Answer: B

Table 20-2

		Base Year (2016)	2017	2018
Product	Quantity	Price	Price	Price
Milk	30	\$2.0	2.2	2.5
Bread	50	3.0	3.5	4.0

- 15). **Refer to Table 20-2.** Assume the market basket for the consumer price index has two products—bread and milk—with prices and quantities shown in the above table. The Consumer Price Index for 2017 equals
- A) 118.
- B) 114.
- C) 86.
- D) 85.

Answer: B

Expenditure of market basket base year = $(30)(2) + (50)(3) = \$210$

Expenditure of market basket in 2017 = $(30)(2.2) + (50)(3.5) = \$241$

$$CPI\ 2017 = \frac{\text{expenditure of market basket in 2017}}{\text{expenditure of market basket in base year}} \times 100 = \frac{241}{210} \times 100 \approx 114$$

- 16). **Refer to Table 20-2.** Consider the values of the consumer price index for 2017 and 2018. The inflation rate for 2018 was equal to

- A) 11.4 percent.
- B) 14.1 percent.
- C) 30.9 percent.
- D) 38.7 percent.

Answer: B

Expenditure of market basket in 2018 = $(30)(2.5) + (50)(4) = \$275$

$$CPI\ 2018 = \frac{\text{expenditure of market basket in 2018}}{\text{expenditure of market basket in base year}} \times 100 = \frac{275}{210} \times 100 \approx 131$$

$$\text{Inflation rate 2018} = \frac{CPI\ 2018 - CPI\ 2017}{CPI\ 2017} \times 100 = \frac{131 - 114}{114} \times 100 = 14.1\%$$

Chapters 21 – 22

Answer the next THREE questions by browsing the GeoFRED world map of 2017 real GDP per capita.

17). Rank Hong Kong, Japan, Korea and Singapore from high to low in terms of 2017 real GDP per capita.

- A) Japan, Hong Kong, Singapore, Korea.
- B) Singapore, Japan, Hong Kong, Korea.
- C) Hong Kong, Japan, Korea, Singapore.
- D) Korea, Hong Kong, Singapore, Japan.

Answer: B

Real GDP per capita (in 2010 US dollars):

Singapore	\$55,235
Japan	\$48,556
Hong Kong	\$37,927
Korea	\$26,152

18). In term of 2017 real GDP per capita, the richest and the poorest African countries are

- A) Botswana; Dem. Rep. Congo.
- B) South Africa; Niger.
- C) Gabon; Malawi.
- D) Eq. Guinea; Burundi.

Answer: D

Real GDP per capita (in 2010 US dollars):

Burundi	\$212
Botswana	\$7,523
Dem. Rep. Congo	\$409
Eq. Guinea	\$11,486
Gabon	\$9,442
Malawi	\$486
Niger	\$396
South Africa	\$7,524

19). Rank Denmark, Finland, Norway and Sweden from high to low in terms of 2017 real GDP per capita.

- A) Norway, Denmark, Sweden, Finland.
- B) Sweden, Norway, Denmark, Finland.
- C) Denmark, Sweden, Finland, Norway.
- D) Finland, Denmark, Norway, Sweden.

Answer: A

Real GDP per capita (in 2010 US dollars):

Denmark	\$60,670
Finland	\$45,983
Norway	\$90,317
Sweden	\$56,473

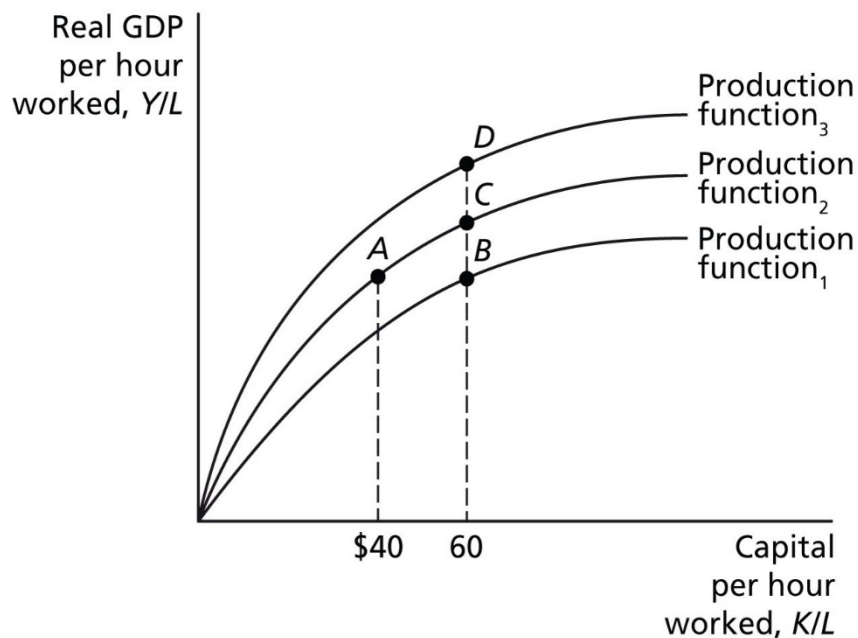
20). If a country grows at an annual rate of 3.5%, it would take approximately _____ years for her GDP per capita to double.

- A) 10
- B) 20 **
- C) 30
- D) 40

Answer: B

Apply the rule of 70 (textbook p.758). Number of years to double = $70/3.5 = 20$.

Answer the next TWO questions in view of the following figure.



21). Suppose the per-worker production function in the figure above represents the production function of Hong Kong. If the Hong Kong government decided to double its support of university education, this would cause a movement from

- A) A to B
- B) B to C **
- C) A to C
- D) D to C

Answer: B

22). Within a country, the impact of wars and revolutions and their subsequent destruction of capital is reflected in the per-worker production function in the figure above by a movement from

- A) A to B.
- B) B to C.
- C) B to A.
- D) C to A.

Answer: D

Rapid economic growth only happened in the past 200 years, a very recent phenomenon from the perspective of human history. Watch the following presentation by Prof Hans Rosling and then answer the next FOUR questions.

<https://www.youtube.com/watch?v=BPt8ELTQMIg&t=64s>

23). What was the upper limit on life expectancy in almost all countries in 1810? Which two countries were slightly better off?

- A) 20; China, India
- B) 40; Britain, Netherlands **
- C) 60; Germany, Japan
- D) 80; Canada, USA

Answer: The upper limit on life expectancy in almost all countries in 1810 was 40. Only Britain and the Netherlands were slightly better off. B

24). Which countries failed to improve much in life expectancy and income as a result of the Industrial Revolution?

- A) Countries in North America
- B) Countries in Europe
- C) Countries in Asia and Africa **
- D) Countries all over the world

Answer: Countries in Asia and Africa did not realize much improvement in either life expectancy or income during the Industrial Revolution. The benefits of that period were confined mostly to European nations. C

25). As of 1948, had disparities in life expectancy and income between countries narrowed or widened? Which were some of the countries that had not made much improvement in either measure by 1948?

- A) Narrowed; Australia and New Zealand
- B) Narrowed; Countries in South America
- C) Widened; China, India and most African countries **
- D) Widened; Countries in Europe and North America

Answer: By 1948, the differences in life expectancy and income between countries were higher than ever. Europe and North America, followed by Japan, had made great strides on both

measures, while such countries as China, India, Indonesia, Bangladesh, and most of the African countries were still characterized by short life expectancies and poverty. C

26). Which statement(s) below describes the general situation today regarding the distribution of countries in terms of health and income.

- A) Health is better everywhere today compared with 1810, even in the poorest countries.
- B) The income and health gaps between countries remain enormous.
- C) Most people are “in the middle” – between the richest countries with the highest income/life expectancy and the poorest countries.
- D) All of the above. **

Answer: By 2009, most Asian and some African countries had made great improvements in life expectancy and income. Rosling comments that by then, most people in the world were “in the middle” between the richest countries with the highest life expectancy (Europe, North America, and Japan) and the poorest countries, like many in sub-Saharan Africa that had endured civil strife or the HIV epidemic (Congo and South Africa). D

Scenario 21-1

Consider the following data for a closed economy:

$Y = \$15$ trillion
 $C = \$11$ trillion
 $I = \$5$ trillion
 $G = \$5$ trillion
 $TR = \$5$ trillion
 $T = \$6$ trillion

27). **Refer to Scenario 21-1.** Based on the information above, what is the level of private saving in the economy?

- A) \$3 trillion
- B) \$4 trillion
- C) \$5 trillion
- D) \$8 trillion

Answer: A

$$S_{\text{private}} = \text{Receipt} - \text{expenditure} = Y + TR - C - T = 15 + 5 - 11 - 6 = 3$$

28). **Refer to Scenario 21-1.** Based on the information above, what is the level of public saving?

- A) \$0
- B) \$1 trillion
- C) \$2 trillion
- D) negative \$4 trillion (a deficit of \$4 trillion)

Answer: D

$$S_{\text{public}} = \text{Receipt} - \text{expenditure} = T - G - TR = 6 - 5 - 5 = -4$$

29). A(n) _____ comes to an end with a business cycle _____.

- A) recession; fluctuation
- B) recession; trough
- C) expansion; trough
- D) expansion; bubble

Answer: B

30). In a small European country, it is estimated that changing the level of capital from \$8 million to \$10 million will increase real GDP from \$2 million to \$3 million. If the number of hours worked in the labor force does *not* change, the slope of the per-worker production function in this range is _____. If spending on capital continued to rise to \$12 million, the slope will become _____ than the previous one, assuming no technological change and no change in the hours of work.

- A) 1/2; steeper
- B) 1/2; flatter
- C) 2; steeper
- D) 2; flatter

Answer: B

See textbook p.796, Figure 22.3. In the picture of the per-worker production function, the x-variable is capital and the y-axis is GDP. The question says that y changes by $3 - 2 = 1$ and x changes by $10 - 8 = 2$. Therefore, $\text{slope} = (\text{change in } y) / (\text{change in } x) = 1 / 2$. The shape of the production function is concave (i.e. the law of diminishing returns), which implies that the slope will become flatter and flatter as the x-variable getting larger and larger.

31). Consider two countries, Alpha and Beta. In Alpha, real GDP per capita is \$6,000. In Beta, real GDP per capita is \$9,000. Based on the economic growth model (Catch-up Line), what would you predict about the growth rates in real GDP per capita across these two countries?

- A) The growth rate of real GDP per capita will be lower in Alpha than it is in Beta.
- B) The growth rate of real GDP per capita will be higher in Alpha than it is in Beta.
- C) The growth rate of real GDP per capita in Alpha and Beta will be the same.
- D) The economic growth model makes no predictions regarding differences in growth rates of real GDP per capita across the two countries.

Answer: B

Ch 23

32). The aggregate expenditure model focuses on the relationship between _____ and _____ in the short run, assuming _____ is constant.

- A) total production; total income; real GDP
- B) total spending; real GDP; total income
- C) total spending; real GDP; the price level
- D) total income; real GDP; the price level

Answer: C

33). The aggregate demand curve is _____ sloping, because it reflects the _____ relationship between the price level and the level of planned aggregate expenditure, and the aggregate expenditure line is _____ sloping which reflects the _____ relationship between real GDP and aggregate expenditure.

- A) downward; positive; upward; negative
- B) downward; negative; upward; positive;
- C) upward; positive; downward; negative
- D) upward; negative; downward; positive

Answer: B

Table 23-15

Real GDP	Consumption	Planned Investment	Government Purchases	Net Exports
\$250	\$210	\$30	\$60	-\$20
300	245	30	60	-20
350	280	30	60	-20
400	315	30	60	-20

Refer to Table 23-15. Using the table above, answer the following questions. The numbers in the table are in billions of dollars.

34). What is the equilibrium level of real GDP?

- A) 250
- B) 300
- C) 350
- D) 400

Answer: C

Equilibrium occurs when real GDP equals to aggregate expenditure (AE), where $AE = C + \text{planned } I + G + NX$. In the third row, $AE = 280 + 30 + 60 - 20 = 350 = \text{real GDP}$.

35). What is the *MPC*?

- A) 0.6
- B) 0.7
- C) 0.8
- D) 0.9

Answer: B

The *MPC* is found by the formula $\frac{\Delta C}{\Delta Y}$. Consider the first two rows, $\Delta C = 245 - 210 = 35$ and $\Delta Y = 300 - 250 = 50$, so the *MPC* = \$35 billion / \$50 billion, or 0.7.

Real GDP	Consumption	Planned Investment	Government Purchases	Net Exports
\$250	\$200	\$40	\$60	-\$20
300	240	40	60	-20
350	280	40	60	-20
400	320	40	60	-20

36). Refer to the above table. If consumption spending declines by \$10 billion, what will happen to equilibrium GDP?

- A) 300
- B) 317
- C) 325
- D) 350

Answer: B

The old equilibrium GDP is 400, as AD in the 4th row = 320 + 40 + 60 – 20 = 400. The first two rows gives

$$MPC = \frac{\Delta C}{\Delta Y} = \frac{240 - 200}{300 - 250} = \frac{40}{50} = 0.8$$

We need to use the multiplier formula to calculate the new equilibrium GDP. First, calculate the multiplier:

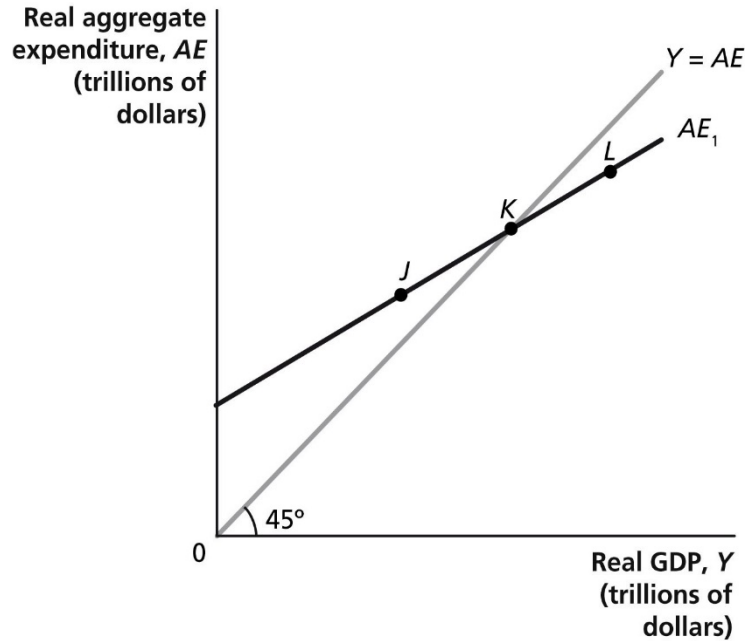
$$\text{Multiplier} = \frac{1}{1 - MPC} = \frac{1}{(1 - 0.8)} = \frac{1}{0.2} = 5$$

Change in equilibrium GDP = change in expenditure × multiplier = -\$10 billion × 5 = -\$50 billion.

New equilibrium GDP = old equilibrium GDP + change in equilibrium GDP = \$400 - \$50 = \$350 billion.

See textbook p.859, Solved Problem 23.4.

Figure 23-1



37). **Refer to Figure 23-1.** According to the figure above, at point *K*, the aggregate expenditure is _____ than GDP; At point *J*, aggregate expenditure is _____ than GDP; At point *L*, aggregate expenditure is _____ than GDP.

- A) greater; less; equal
- B) equal; greater; less
- C) less; equal; greater
- D) none of the above

Answer: B

At point *J*, aggregate expenditure is greater than GDP.

At point *L*, aggregate expenditure is less than GDP.

38). **Refer to Figure 23-1.** If the economy is at point *L*, what will happen?

- A) GDP will be increasing.
- B) Actual inventories are less than planned inventories.
- C) Inventories have risen above their desired level, and firms decrease production.
- D) Inventories have risen above their desired level, and firms increase production.

Answer: C

39). Net exports of United States usually _____ when \$US falls in value relative to other currencies and _____ when the U.S. economy is expanding.

- A) increase; increase
- B) decrease; increase
- C) increase; decrease
- D) decrease; decrease

Answer: C

40). Given the equations for C , I , G , and NX below, what is the marginal propensity to save?

$$C = 1,000 + 0.8Y$$

$$I = 1,500$$

$$G = 1,250$$

$$NX = 100$$

A) 0.2

B) 0.8

C) 1.8

D) 10

Answer: A

The consumption function $C = 1000 + 0.8Y$ is a straight line with slope 0.8. That is, $MPC = \text{change in } C / \text{change in } Y = 0.8$. $MPS = 1 - MPC = 1 - 0.8 = 0.2$. See textbook p.839, Solved Problem 23.2.

$$C_1 = 1000 + 0.8Y_1 \quad (1)$$

$$C_2 = 1000 + 0.8Y_2 \quad (2)$$

Subtract (2) from (1): $C_2 - C_1 = 1000 - 1000 + 0.8(Y_2 - Y_1)$

Let $\Delta C = C_2 - C_1$ and $\Delta Y = Y_2 - Y_1$. We can write $\Delta C = 0.8\Delta Y$ or $MPC \equiv \Delta C / \Delta Y = 0.8$.