

## Principles of Macroeconomics: Quiz 1 [2023/04/07]

### Part A: Multiple Choice (60%; 5% each)

United Breakfast is a country which produces only sandwiches, hamburgers, and beverages as shown below in the table. The base year for the CPI and GDP deflator is 2021. The CPI basket consists of 3 sandwiches, 5 hamburgers and 10 beverages.

Year	Sandwiches		Hamburgers		Beverages	
	Quantity	Price	Quantity	Price	Quantity	Price
2019	10	\$15	30	\$20	100	\$4
2020	20	\$20	50	\$30	120	\$5
2021	30	\$20	50	\$30	150	\$5
2022	20	\$20	60	\$40	150	\$5

1. Which of the following is true?

- (A) The inflation rate in 2020 is lower than the inflation rate in 2021 using both GDP deflator and CPI methods.
- (B) The real GDP of United Breakfast for 2022 is \$2950.**
- (C) The GDP deflator for 2019 = nominal GDP in 2019 / real GDP in 2021.
- (D) The CPI for 2020 is lower than the GDP deflator for 2020.
- (E) The CPI for 2021 is higher than the GDP deflator for 2021.

Observe that the price level of 2020 and 2021 is identical

2. Following the above table, the CPI basket is fixed, which consists of 3 sandwiches, 5 hamburgers, and 10 beverages. Because the price of hamburgers increased in 2022, so in reality, the typical consumer consumed 4 sandwich, 4 hamburgers, and 10 beverages in 2022. If we use the CPI to estimate how the purchasing power of consumers changes, then...

- (A) The purchasing power would decrease, and the CPI would be underestimated.
- (B) The purchasing power would decrease, and the CPI would be overestimated.**
- (C) The purchasing power would increase, and the CPI would be underestimated.
- (D) The purchasing power would increase, and the CPI would be overestimated.
- (E) Purchasing power would still be estimated correctly.

Stuffs are more expensive → purchasing power decreases, and CPI tends to be overestimated

Breakfast-Factory is the only factory which produces sandwiches and hamburgers in the United Breakfast. Suppose flour is the only ingredient in producing sandwiches and hamburgers. Answer the following questions:

3. Suppose Breakfast-Factory imported the flour from abroad. What **would NOT count as investment** in the GDP statistics?

- (A) Buying more flour to eventually make sandwiches and hamburgers.
- (B) Importing a new bread-baking machine from France.
- (C) Payments for the staff training and the salary payments.**
- (D) Buying a new truck for the delivery of sandwiches and hamburgers.
- (E) Buying a new factory.

**(A) (B) Inventory increases and import increase as well.**

4. Expecting a high inflation rate in the future, Breakfast-Factory decides to build a new factory. Agreeing on a 5% nominal interest rate to be paid on a loan, Breakfast-Factory borrows money from the bank. Which of the following is NOT true?

- (A) If the expected inflation rate of Breakfast-Factory is 4%, then the real interest rate = 1%.
- (B) If the inflation rate turns out to be lower than they both expected, then the real interest rate is lower than their expectation.**
- (C) If the inflation rate turns out to be higher than they both expected, then the Breakfast-Factory gains from this unexpected high inflation.
- (D) If the inflation rate turns out to be lower than they both expected, then the bank loses from this unexpected low inflation.**
- (E) Bread-Factory decides to build a new factory since they can sell the sandwiches and hamburgers at a higher price in the future.

**Sorry that I made a mistake in q4, both B and D are correct, answers other than B or D get 0 point.**

5. Expecting a high inflation rate in the future, Breakfast-Factory decides to build a new factory. How does this affect the loanable funds market?

(Suppose Breakfast-Factory saves all of its retained surplus in the loanable funds market.)

- (A) Loanable funds will increase and the real interest rates will fall if Breakfast-Factory borrows money from the loanable funds market.
- (B) Loanable funds will decrease and the real interest rates will rise if Breakfast-Factory borrows money from the loanable funds market.
- (C) Loanable funds will increase and the real interest rates will rise if Breakfast-Factory has enough of its own funds to finance the new factory without borrowing.
- (D) Loanable funds will decrease and the real interest rates will rise if Breakfast-Factory has enough of its own funds to finance the new factory without borrowing.**
- (E) Loanable funds and the real interest rates will not be affected if Breakfast-Factory has enough of its own funds to finance the new factory without borrowing.

**(A) (B) If Breakfast-Factory "borrows", demand for loanable funds increase.**

**(C) (D) If Breakfast-Factory use its own money, supply for loanable funds decrease.**

6. The production function of Daiwan is  $Y = AL^{\frac{1}{3}}K^{\frac{2}{3}}$ , A is the total factor productivity, L and K denotes labor and capital respectively. Which of the following statement is NOT true?

- (A) The production function is constant return to scale.
- (B) Holding all other factors constant, the marginal return of an extra unit of physical capital is diminishing.
- (C) Holding all other factors constant, the marginal return of an extra unit of labor is diminishing
- (D) Removing a trade restriction, such as a tariff, can increase A, which promote economic growth.
- (E) There is a diminishing return to the total factor productivity.

Recall the definition of the diminishing return and check the production function.

Wesley family, Granger family, and Potter family are three households who live in the country. Each of the households earn \$30,000 in 2022. The table below shows how the three households use their \$30,000 income in 2022.

Wesley Family		Granger Family		Potter Family	
Food	\$4,000	Food	\$2,000	Food	\$1,000
Bank deposit	\$4,000	Book	\$8,000	Glasses	\$4,000
Tuition	\$10,000	Bond	\$15,000	Stock	\$3,000
Rent	\$12,000	Insurance	\$5,000	New house	\$22,000

7. Which of the following statement is true?

- (A) The investment of the Wesley family = \$10,000 in 2022.
- (B) The saving of the Granger family = \$15,000 in 2022.
- (C) The investment of the Granger family = \$0 in 2022.
- (D) The investment of the Potter family = \$25,000 in 2022.
- (E) The saving of the Potter family = \$22,000 in 2022.

Saving, Consumption, Investment

8. Suppose the nominal interest rate is 7%. After 30 years the value of your current saving is \$80,000. Using to rule of 70, what is the present value of your saving.?

- (A) \$640,000
- (B) \$80,000
- (C) \$20,000
- (D) \$13,333
- (E) \$10,000

$$70/7 = 10, 30/10 = 3$$

$$X * 2^3 = 80,000, X = 10,000$$

9. Which is greater? The future value in five years of \$1000 now, or the present value of \$1000 to be obtained in five years?

- (A) The future value in five years of \$1000 now.
- (B) The present value of \$1000 to be obtained in five years.
- (C) They are of equal value.
- (D) There is not enough information given to judge.

Real interest rate  $> 0$ .  $1000 \cdot (1+r\%) > 1000 / (1+r\%)$

10. Which of the following statement is NOT true?

- (A) If the reserve requirement is 5 %, then the maximum increase in money supply of \$1 deposit is 20
- (B) If the reserve requirement is 5 %, then the minimum increase in money supply of \$1 deposit is 0
- (C) If the banks keep 100% of the deposit, then the money multiplier is 1.
- (D) The central bank can reduce the money supply by selling bonds through the open market operation.
- (E) The central bank does not control the amount that the bankers choose to lend.

(A) "Increase in money supply" should be 19.

11. If the money supply grows 10 %, and the real output grows 5 %, then the prices should rise by...?

- (A)  $> 10 \%$
- (B)  $10 \%$
- (C)  $> 5 \%$  and  $< 10 \%$
- (D)  $5 \%$
- (E)  $< 5 \%$

$1.1MV = P(1.05Y) \rightarrow P = (1.1/1.05) MV/Y \rightarrow 1.1/1.05 < 5\%$ , 5% is consider correct this time.

12. Suppose that people expect inflation to be 5% but that, in fact, prices rise by 6%. Which of the following would be hurt by the unexpectedly high inflation?

- (A) The government
- (B) A homeowner with a fixed-rate mortgage
- (C) An union worker in the second year of a labor contract
- (D) A business owner who borrowed invest in capitals
- (E) A college that has invested some of its endowment in government bonds

A  $\rightarrow$  there is inflation tax, the government prints money to use but the households suffer.

C  $\rightarrow$  Please refer to the inflation fallacy. Counted as correct this time if there is sticky wage.

**Short Answers (40%, 10% each for question 1, 3 and 20% for question 2)**

1. Suppose consumption is \$150 million, investment is \$100 million, government purchase is \$50 million, and taxes are \$30 million. Assuming this economy is closed. Calculate (i) GDP (ii) private saving (iii) budget deficit (iv) national saving

(v) How does the government finance the budget deficit?

(i) \$300 million (ii) \$120 million (iii) \$20 million (iv) \$100 million

(v) Borrow from the bonds market (decrease supply of funds in the loanable funds market)

2. Willy and Jason are two residents of the Econ-valley who are facing a choice between two options:

Option A pays \$10,000 with probability 0.8 and \$160,000 with probability 0.2

Option B pays \$40,000 for sure

Willy has utility function  $\mu = 8W^{\frac{1}{4}}$

Jason has utility function  $\mu = \frac{1}{500}W$

a. Should Willy choose option A or option B? Explain.

b. What is Jason's expected utility for option A and option B?

c. What is Willy's risk preference? What is Jason's risk preference? Provide your reasoning.

a.

Willy's expected utility for option A =  $8 \cdot 10 \cdot 0.8 + 8 \cdot 20 \cdot 0.2 = 96$

Willy's expected utility for option B =  $80\sqrt{2}$

Since  $80\sqrt{2} > 96$  (Option B yields higher expected utility), Willy should choose option B

Jason's expected utility for option A

b.

Willy's expected utility for option A = Willy's expected utility for option B = 80

c.

Willy is risk averse. Jason is risk neutral.

Given the same expected payoff, Willy chooses option with less uncertainty and Jason is

Indifferent among two options

3. Suppose that Deposit is \$1,000. The nominal interest rate is 10 % and the tax rate is 10 %.

a. If the inflation rate is 2 %, what is the pre-tax real interest rate?

b. If the inflation rate is 2 %, what are the after-tax nominal interest rate and the real interest rate?

c. If the inflation rate is 5 %, what are the after-tax nominal interest rate and the real interest rate?

Nothing but calculation. Please solve it by yourself