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Content

This exam will cover the content from classes 1-11. This includes all material from in-class lecture, readings, and homeworks.

In other words, it is expected that you have attended all classes, read all assigned readings, completed all homeworks, and are prepared to answer questions on this material.

Practice Problems

> ⚠ Warning
>
> This is not an exhaustive list of questions or even topics. You still need to review all material and it would be a good idea to create your own questions to try to answer.

1. What role does the rate of interest play in automatically restoring full employment equilibrium output in the classical model?

   The interest rate restores full employment when spending is below the amount required for production at the full employment level. In this case, there is too much saving – consumers are choosing not spend on consumption, and firms are choosing not to spend on investment goods. Savings pile up in banks who then want to loan the money out. In order to attract new borrowers, the banks will lower the interest rates they charge. As a result, firms will find that some of their investments projects with a lower rate of return are now profitable because they are cheaper to finance. So these firms will be incentivized to borrow, and spend more. At the same time, lower interest rates mean that the reward for saving has fallen, and thus consumers are incentivized to stop saving as much and spend more on consumption. Thus the incentives of consumers, banks, and firms all cause them to act in a way to restore spending to its full employment level. Graphically this would be a shift to the right of the saving curve in the loanable funds market.

2. What is the Keynesian critique of the self-equilibrating role of the interest rate in the classical model?

   The Keynesian critique is that when consumers save additional funds, they are also depriving someone else in the economy of income. It is true that for the consumer who has cut spending, their additional funds are in banks, but at the same time, the other people in the economy who have lost income (from reduced sales to consumers) have to cut back their saving. The paradox of thrift suggests that the reduction in saving from other people in the economy will exactly offset the additional saving of the initial consumers. This means that banks will not actually have savings pile up, and thus will

have no incentive to lower interest rates as described above. The result is that the economy will just settle at a new, lower level of income.

3. Define unemployment and describe the formula for the unemployment rate

   Unemployment is a category for people who are jobless, have actively looked for work in the last 4 weeks, and are available for work. The formula for the unemployment rate is the total number of the unemployed divided by the labor force (unemployed + employed).

4. Define inflation and explain why economists care about it.

   Inflation is a general rise in prices, measured by a price index. Economists care about inflation because there is no such thing as "pure" inflation (where all prices and incomes rise by the same amount). Instead it is always the case that some prices and incomes rise faster than others. A classic example is the distribution of income between lenders and borrowers. Typically loan contracts involve fixed payments of interest (think about a mortgage which usually amortizes repayment in fixed installments over 30 years). This means that as prices rise, the borrower will likely find that their income rises (over a long enough period almost all incomes rise at least somewhat with inflation), but their loan payment is fixed in nominal terms. The burden of repaying the loan thus falls over time. For the lender however, their interest income is fixed and is worth less and less as prices rise. So economists typically care about inflation because it can redistribute income. Economists also care about inflation to the extent it involves informational costs or costs associated with changing prices (menu costs).

5. First, define nominal GDP and real GDP. Second, is it possible for nominal GDP in a year to be less than real GDP in the same year? Explain.

   Nominal GDP is the the market value of the goods and services produced by labor and property located in the United States, during a given period. Real GDP is nominal GDP adjusted by the GDP deflator, an index of prices. It is possible for nominal GDP to be less than Real in the same year if the base year price index for the GDP deflator is lower than the current year.

6. Explain Okun's law.

   Okun's law is the consistent relationship between GDP and unemployment. It is typically specified in terms of changes in the unemployment rate and real GDP growth. In class we showed an estimated Okun's law that specified:

   Change in unemployment = 0.18 -0.06 x GDP Growth Rate

   This implies that a quarterly GDP growth rate of 3% is required to maintain a constant level of unemployment.

7. Suppose a country using the United States' system of calculating official unemployment statistics has 100 million people, of whom 50 million are working age. Of these 50 million, 20 million have jobs. Of the remainder: 10 million are

actively searching for jobs; 10 million would like jobs but are not searching; and 10 million do not want jobs at all. Calculate:

    a.   the unemployment rate

        10/ (20+10) = 0.333 →3.33%

    b.   the labor force participation rate

        (20+10)/50 = 0.6 →60%

8. ~~Describe, in as much detail as possible, the "investment" component of GDP expenditures (i.e. what kinds of spending are included?)~~

9. Suppose the United States economy is represented by the following equations:

$$Z = C + I + G$$
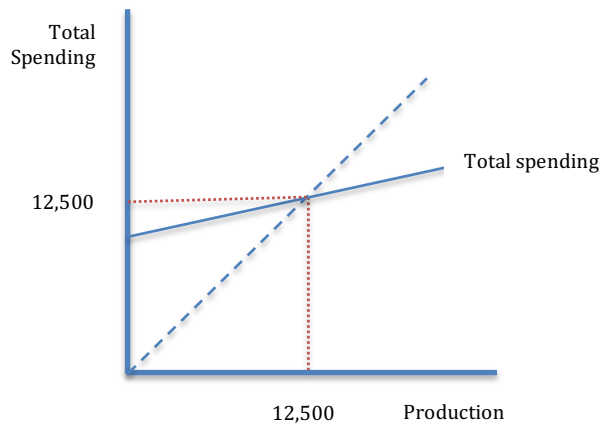
$$C = 800 + .8Y_D$$

$$Y_D = Y - T$$

$$T = 1000$$

$$I = 500$$

$$G = 2000$$

    a.   Given the above variables, calculate the equilibrium level of output.

        *Y = 5 * (800 – 800 + 500 +2000) = $12,500*

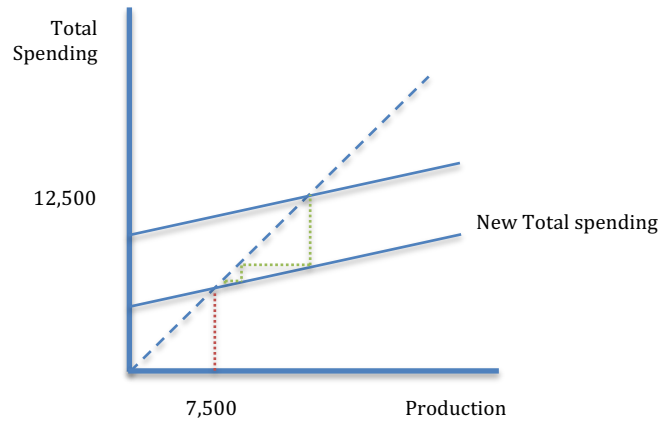   b.   Illustrate the equilibrium level of output for this economy.

    c.   Now, assume that the federal government has decided to balance its budget via spending reductions. Calculate the effects of this on the equilibrium level of output.

d. Graphically illustrate the effects of this change, including showing the adjustment to new equilibrium.

The adjustment is shown in green above.

e. Would it be better (in terms of output) for the government to balance their budget via tax increases or spending reductions?

It would be better to balance their budget via tax increases. You should confirm this algebraically. The institution here is that when the government increases taxes, only a portion of the taxed income would have been spent (0.8), while when it cuts spending all of the dollar value comes in the form of reduced spending.

10. Using the following simple model of an economy, illustrate and explain the paradox of thrift:

$$Z = C + I$$

$$C = c0 + c1Y$$

$$I = I0$$

Equilibrium $Y = 1/(1-c_1) * [c_0 + I_0]$

Change in Y given a fall in c_0 = $\dfrac{1}{(1-c_1)} * (\Delta c_0)$

When c_0 falls there are two effects on consumption. A direct effect (the fall in c_0) and an indirect effect (the fall in consumption from the fall in income.

Change in C given a fall in c_0 = $\Delta c_0 + c_1(\Delta Y)$

Change in savings given a fall in c_0

$$= \Delta Y - \Delta C = \Delta Y - \Delta c_0 + c_1(\Delta Y) = -\Delta c_0 + \Delta Y(1 - c_1)$$

If we plug in the equation for the change in Y:

$$= -\Delta c_0 + \frac{1}{(1 - c_1)} * (\Delta c_0) * (1 - c_1)$$

Which reduces to:

$$= -\Delta c_0 + \Delta c_0 = 0$$

11. Explain and give an example of the fallacy of composition

The fallacy of composition suggests that the whole is greater than the sum of the parts. In class we used the example of standing in the movie theater. One person can stand and see better, but if everyone stands, nobody is any better off.

12. What are the phases of the business cycle?

The peak, trough, expansion and contraction.

13. What does it mean to say GDP is not a primary fact?

GDP is not a primary fact (see Diane Coyle reading) in the sense that it does not exist out in the world – unlike the number of unemployed people for instance.

14. Given the following economy, calculate GDP using each of the 3 approaches:

	Intermediate Product	Income	Expenditures
Farmer, Wheat	$0	$1	$1
Miller, Flour	$1	$2	$3
Baker, Bread	$3	$4	$7
Total	$4	$7	$11

See GDP slides for answer

15. An economy produces three goods: cars, oil, and solar panels. Quantities and prices per unit for years 2012 and 2013 are as follows:

	2019 Price	2019 Quantity	2020 Price	2020 Quantity
Cars	15000	100	20000	75
Oil	200	50	150	50

	2019 Price	2019 Quantity	2020 Price	2020 Quantity
Solar Panels	2000	10	2200	20

a. What is nominal GDP in 2019 and in 2020? By what percentage does nominal GDP change from 2019 to 2020?

Nominal 2019 = 1,500,000 (Cars) + 10,000 (Oil) + 20,000 (Solar Panels)

= 1,530,000

Total Nominal GDP in 2020: = 1,500,000 (Cars) + 7,500 (Oil) + 44,000 (Solar Panels) = 1,551,500

Growth = 1.4%

b. Using 2020 as the base year, what is real GDP in 2019 and in 2020? By what percentage does real GDP change from 2019 to 2020?

Total Real GDP in 2019: = 2,000,000 (Cars) + 7,500 (Oil) + 22,000 (Solar Panels) = 2,029,500

Real GDP in 2020 (No calculation needed because it's already in 2020 prices): = 1,551,500

Growth = -23.55%

c. Using 2020 as the base year, compute the GDP deflator for 2019 and for 2020, and compute the rate of inflation from 2019 to 2020.

*GDP deflator for 2019: GDP Deflator = (Nominal GDP / Real GDP) * 100 = (1,530,000 / 2,029,500) * 100 ≈ 75.30*

*GDP deflator for 2020: GDP Deflator = (Nominal GDP / Real GDP) * 100 = (1,551,500 / 1,551,500) * 100 = 100.00*

*Rate of Inflation = ((GDP deflator in 2020 - GDP deflator in 2019) / GDP deflator in 2019) * 100*

*= ((100.00 - 75.30) / 75.30) * 100 ≈ 32.81%*

16. ~~Explain the concept of credit rationing. What does it imply about forward looking consumption theories?~~

17. You go to the gas station and see that the price of gasoline is unchanged. Can you use this observation to determine that the economy is not experiencing inflation? Explain your reasoning.

No, you cannot. One price does not indicate inflation – which is a general rise in prices. It may be the case that all prices are not rising, but it is not possible to tell whether this is true or not based on a single price.

18. Suppose the typical college student spends money primarily on the products in the following table.

Product	Quantity	2019 price	2020 price
Soda	365	$2.25	$2.30
Pizzas	200	$10.00	$11.00
Chicken wings	165	$7.00	$7.50
Room and board	1	$10,000	$10,800
Textbooks	4	$150	$165

   a.   What is the cost of the basket in 2019?

Cost of the basket in 2019 = (365 * $2.25) + (200 * $10.00) + (165 * $7.00) + (1 * $10,000) + (4 * $150) Cost of the basket in 2019 = $821.25 + $2000 + $1155 + $10,000 + $600 Cost of the basket in 2019 = $14,576.25

   b.   What is the cost of the basket in 2020?

Cost of the basket in 2020 = (365 * $2.30) + (200 * $11.00) + (165 * $7.50) + (1 * $10,800) + (4 * $165) Cost of the basket in 2020 = $839.50 + $2200 + $1237.50 + $10,800 + $660 Cost of the basket in 2020 = $16,737.00

   c.   What is the 2020 inflation rate for a college student?

Inflation Rate = (($16,737.00 - $14,576.25) / $14,576.25) * 100 Inflation Rate ≈ 14.84%

   d.   Has the cost of living for college students risen or fallen?

The cost of living for college students has risen by approximately 14.84% from 2019 to 2020. This means that it is more expensive for college students to purchase the same basket of goods and services in 2020 compared to 2019.

19. In what sense is the labor market recovery "historic" according to Joey Politano?

The recovery is historic in the sense that employment has returned to its pre-pandemic levels at a faster rate (and from a steeper decline) than 2008.

20. Define the prime-age employment rate. What advantages might it have over the unemployment rate as an indicator of the health of the labor market?

The prime-age employment rate, often referred to as the prime-age labor force participation rate or employment-to-population ratio for prime-age workers, is a labor market indicator that focuses on the employment status of individuals within a specific age group, typically between the ages of 25 and 54. It is calculated by dividing the number of people employed within this age group by the total population in that age group.

It has some advantages over unemployment rates because employment is much easier to define (and respondents to the survey understand the concept better) than unemployment which depends on the fuzzy notion of "actively seeking."

21. What is the Beveridge curve? How did it change in the Covid era? What might be some reasons why?

    The Beveridge curve shows the relationship between job openings and the unemployment rate. It generally slopes downward suggesting that as job openings fall, unemployment rises, indicating that the demand for labor (not supply) is often what drives unemployment. During the pandemic it seems to have shifted up – that is, higher unemployment given the same level of job openings. This may be because workers were concerned about health risks of returning to work, or because they were receiving more generous unemployment insurance payments, or both.

22. In the classical model, how are falling wages and prices supposed to restore economic activity?

    The wealth effect suggests that as prices fall, pre-existing accumulated wealth is now worth more in terms of goods. This may encourage consumption to increase when prices fall. The Keynes effect suggests that falling prices mean less need for cash, and so greater amounts of money in savings accounts leading to lower interest rates (and thus higher investment spending).

    It is key to remember that falling prices don't increase total expenditures in the economy just because goods and services are cheaper. This is because falling prices also means falling income for those who sell goods and services. Thus from a macroeconomic perspective, the classical model can only rely on the wealth effect and the Keynes effect. In practice however, these effects are likely to be small.

23. What are some key features of durable goods consumption?

    Durable goods are expensive, long lived, easily postponed, and often financed by credit. This means they are often the most volatile category of consumption.

24. Explain the concept of the multiplier to a person who has not taken an economics course.

    Answers will vary. The multiplier effect measures how much the initial spending multiplies or ripples through the economy. In simple terms, if the multiplier is 2, it means that for every dollar you spend, it eventually leads to a total of $2 being spent in the economy. This happens as the money circulates through various businesses and people's hands.

    So, the multiplier is like a magnifying glass for economic activity. It shows how spending can have a bigger impact by creating more income for others, encouraging them to spend as well, and contributing to overall economic growth.

25. What are the implications of the forward-looking consumption theories for the value of the multiplier?

   In forward-looking consumption theories, individuals are more cautious and may not increase their spending significantly even if they receive a temporary increase in income (e.g., through a tax cut or one-time bonus). They may choose to save more of that additional income because they are thinking about their long-term financial situation. This behavior reduces the size of the multiplier compared to what it would be in a purely consumption-driven Keynesian model.