

ECON 3010 Intermediate Macroeconomics Solutions to the Final Exam

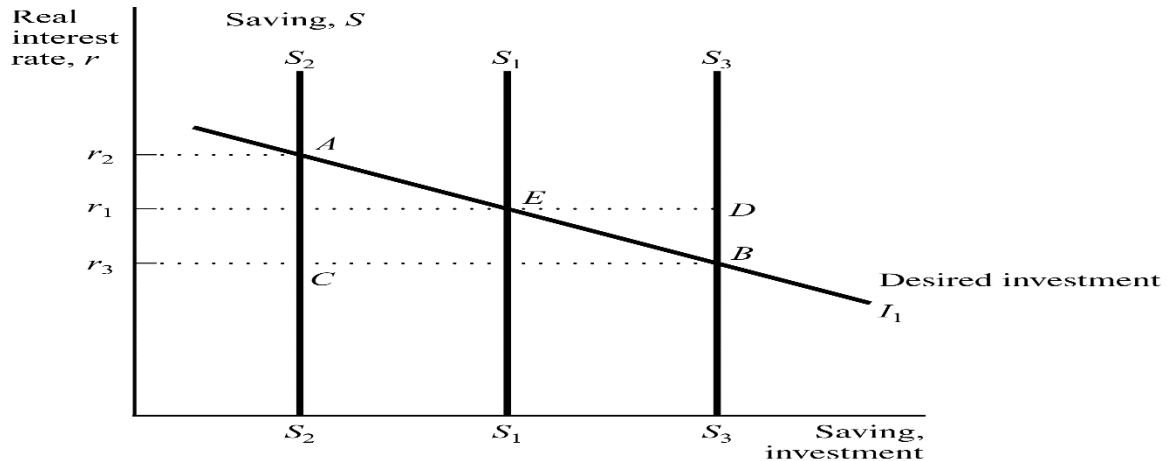
Multiple Choice Questions. (60 points; 3 pts each)

- #1. How does the distinction between flexible and sticky prices impact the study of macroeconomics?
- a. Flexible prices are typically assumed in the study of the long run, while sticky prices are assumed in the study of the short run.
 - b. The study of flexible prices is confined to microeconomics, while macroeconomics focuses on sticky prices.
 - c. Macroeconomists use flexible prices to explain inflation and sticky prices to explain unemployment.
 - d. Endogenous variables are measured using flexible prices, while exogenous variables are measured using sticky prices.
- #2. The total income of everyone in the economy is exactly equal to the total:
- a. consumption expenditures of everyone in the economy.
 - b. government expenditures.
 - c. expenditures of all businesses in the economy.
 - d. expenditure on the economy's output of goods and services.
- #3. The amount of capital in an economy is a _____ and the amount of investment is a _____.
- a. intermediate good; final good
 - b. stock; flow
 - c. flow; stock
 - d. final good; intermediate good
- #4. The *real* interest rate is the:
- a. rate of interest actually paid by consumers.
 - b. nominal interest rate minus the rate of inflation.
 - c. rate of interest actually paid by banks.
 - d. rate of inflation minus the nominal interest rate.

#5. In a closed economy, private saving equals:

- a. $Y - C - G$.
- b. $Y - T$.
- c. $Y - I - C$.
- d. $Y - T - C$.

#6.



The economy begins in equilibrium at Point E, representing the real interest rate, r_1 , at which saving, S_1 , equals desired investment, I_1 . What will be the new equilibrium combination of real interest rate, saving, and investment if the government cuts taxes, holding other factors constant?

- a. Point A
- b. Point B
- c. Point C
- d. Point D

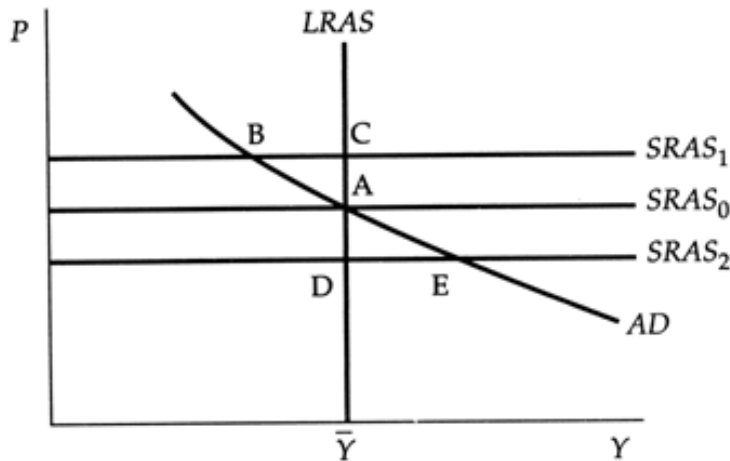
#7. If there is no currency and the proceeds of all loans are deposited somewhere in the banking system and if rr denotes the reserve–deposit ratio, then the total money supply is:

- a. reserves times rr .
- b. $1/rr$.
- c. reserves divided by $(1 - rr)$.
- d. reserves divided by rr .

- #8. If currency held by the public equals \$100 billion, reserves held by banks equal \$50 billion, and bank deposits equal \$500 billion, then the money supply equals:
- \$100 billion.
 - \$650 billion.
 - \$150 billion.
 - \$600 billion.**
- #9. “Inflation tax” means that:
- as the price level rises, taxpayers are pushed into higher tax brackets.
 - in a hyperinflation, the chief source of tax revenue is often the printing of money.
 - as the price level rises, the real value of money held by the public decreases.**
 - as taxes increase, the rate of inflation also increases.
- #10. If net capital outflow is positive, then:
- the trade balance must be positive.**
 - the trade balance must be negative.
 - exports must be positive.
 - exports must be negative.
- #11. If the real exchange rate is high, foreign goods:
- and domestic goods are both relatively cheap.
 - are relatively expensive and domestic goods are relatively cheap.
 - and domestic goods are both relatively expensive.
 - are relatively cheap and domestic goods are relatively expensive.**
- #12. Unemployment caused by the time it takes workers to search for a job is called _____ unemployment.
- insider
 - frictional**
 - efficiency
 - structural

- #13. Discouraged workers are individuals who:
- have jobs that do not match their skills (e.g., a Ph.D. driving a taxi cab).
 - want a job but have given up looking for one.
 - have been unemployed for more than 26 weeks.
 - call themselves unemployed but are not seriously looking for a job.

#14.



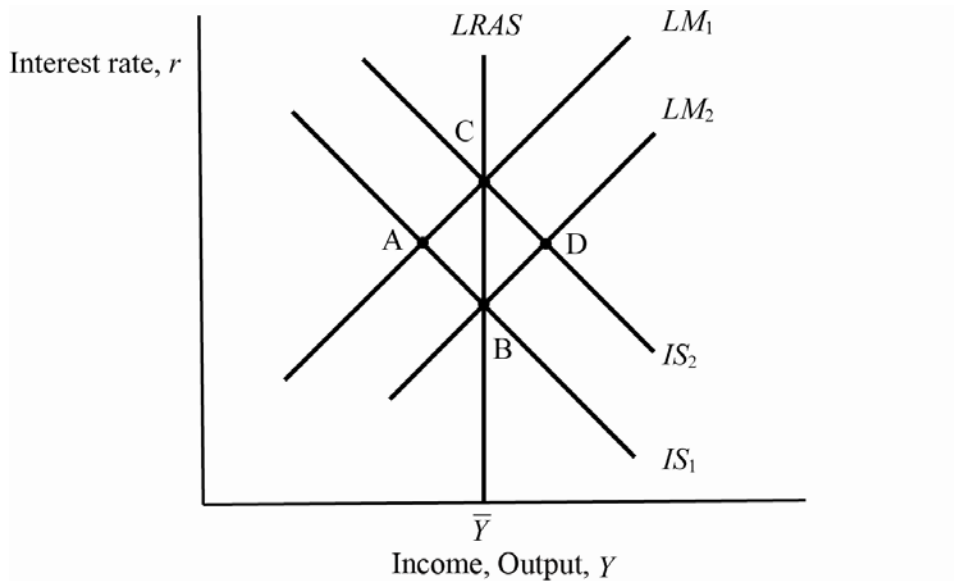
Assume that the economy starts at point A and there is a drought that severely reduces agricultural output in the economy for just one year. In this situation, point _____ represents the short-run equilibrium immediately following the drought and point _____ represents the eventual long-run equilibrium.

- D; A
 - E; D
 - B; C
 - B; A
- #15. Along any given *IS* curve:
- government spending is fixed, but tax rates vary.
 - tax rates are fixed, but government spending varies.
 - both government spending and tax rates vary.
 - both government spending and tax rates are fixed.

#16. If the LM curve is vertical and government spending rises by G , in the $IS-LM$ analysis, then equilibrium income rises by:

- zero.
- G .
- more than zero but less than $G/(1 - MPC)$.
- $G/(1 - MPC)$.

#17.



Based on the graph, if the economy starts from a short-term equilibrium at A, then the long-run equilibrium will be at ____ with a ____ price level.

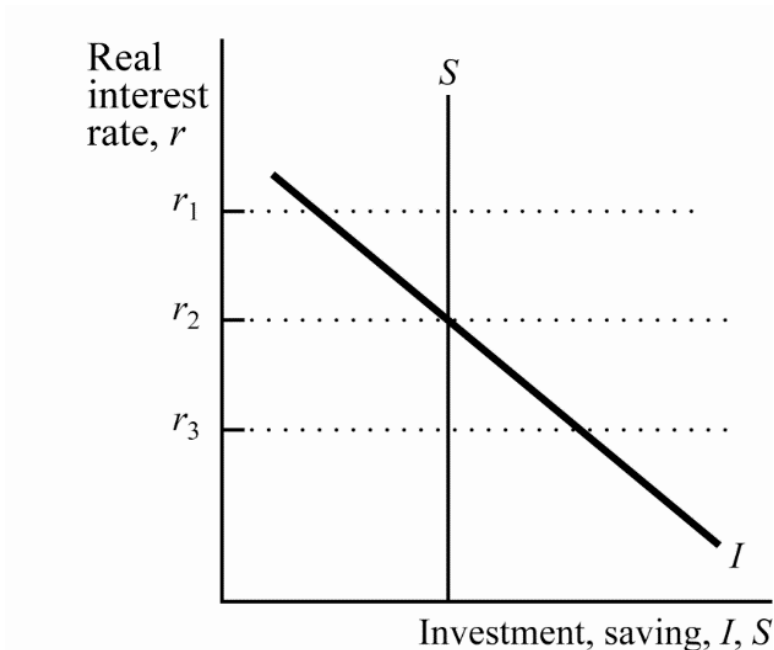
- C; lower
- C; higher
- B; higher
- B; lower

#18. If the short-run aggregate supply curve is steep, the Phillips curve will be:

- unrelated to the slope of the short-run aggregate supply curve.
- backward-bending.
- steep.
- flat.

- #19. According to the traditional viewpoint of government debt, a tax cut without a cut in government spending:
- has no effect on consumer spending but reduces private saving.
 - has no effect on consumer spending but reduces national saving.
 - stimulates consumer spending in the short run and reduces private saving.
 - stimulates consumer spending in the short run and reduces national saving.

#20.



In a small open economy, if the world interest rate is r_1 , then the economy has:

- a trade deficit.
- negative capital outflows.
- balanced trade.
- a trade surplus.

Problem Solving / Essay Questions. (120 points)

#21. (30 pts) Consider a macroeconomy that produces three goods.

Product	Quantity		Price	
	2017	2018	2017	2018
A	10	12	\$5	\$6
B	20	20	\$1	\$1
C	5	4	\$10	\$12

(a) (10 pts) Calculate nominal and real GDP for 2017 and 2018 using 2017 as the base year. What is the GDP deflator in 2017 and 2018?

$$\text{Nominal GDP in 2017} = (10 \times \$5) + (20 \times \$1) + (5 \times \$10) = \$120.$$

$$\text{Nominal GDP in 2018} = (12 \times \$6) + (20 \times \$1) + (4 \times \$12) = \$140.$$

$$\text{Real GDP in 2017} = \text{Nominal GDP in 2018}.$$

$$\text{Real GDP in 2017} = (12 \times \$5) + (20 \times \$1) + (4 \times \$10) = \$120.$$

$$\text{GDP Deflator in 2017} = 100 \times (\text{Nominal GDP in 2017} / \text{Real GDP in 2017}) = 100.$$

$$\text{GDP Deflator in 2018} = 100 \times (\text{Nominal GDP in 2018} / \text{Real GDP in 2018}) = 117.$$

(b) (10 pts) Assume that the typical consumer's basket of goods is given by the combination (A=2, B=1, C=3). Calculate the CPI for 2017 and 2018, as well as the CPI inflation rate.

$$\text{CPI in 2017} = 100.$$

$$\text{CPI in 2018} = 100 \times \frac{(2 \times \$6) + (1 \times \$1) + (3 \times \$12)}{(2 \times \$5) + (1 \times \$1) + (3 \times \$10)} = 100 \times \frac{\$49}{\$41} = 120.$$

$$\text{CPI inflation rate} = 20\%.$$

(c) (10 pts) Comment on the growth rate of output and the price level in the macroeconomy.

Which measure – CPI or GDP deflator – is a better measure of inflation? Defend your answer.

As measured by real GDP, the economy did not grow between 2012 and 2013. However, the price level did increase. The GDP deflator rate is 17%, while the CPI inflation rate is 20% for this example. In general, there are pros and cons of each inflation measure. For example, since the CPI uses a fixed basket of goods, so it does not allow for the substitution away from good C and toward good A. Typically, the GDP deflator includes goods and services that may not be in a consumer's basket, so it does not accurately measure changes in the cost of living for households.

#22. (30 pts) Assume that currency (C) is \$10 billion and reserves (R) are \$10 billion. The reserve-deposit ratio (rr) and the currency-deposit ratio (cr) are both equal to 0.2.

(a) (10 pts) What is the monetary base? What is the amount of demand deposits? What is the money multiplier? What is the money supply?

The monetary base is $B = C + R$. In this case, $B = \$10 \text{ billion} + \$10 \text{ billion} = \$20 \text{ billion}$.

Using either rr or cr , demand deposits must equal \$50 billion.

The money multiplier is $m = \frac{1+cr}{rr+cr} = \frac{1.2}{0.4} = 3$.

The money supply is given by $M = m \times B = 3 \times \$20 \text{ billion} = \$60 \text{ billion}$.

(b) (10 pts) Assume the Fed increases reserves to \$11 billion. If real GDP and velocity remain constant, what is the implied rate of inflation?

If R increases to \$11 billion, then the new monetary base is $B = \$21 \text{ billion}$. Using a money multiplier of $m = 3$, the new money supply is $M = m \times B = 3 \times \$21 \text{ billion} = \$63 \text{ billion}$. The percentage increase in the money supply is therefore $\% \Delta M = 5\%$. The quantity equation (in percent-change form) then implies that inflation would also equal 5%.

(c) (10 pts) Continue to assume that the velocity of money and real GDP are constant. If the Fed wishes to instead target a 10% inflation rate, how would they accomplish their goal?

To target a 10% inflation rate, the Fed would need to target a 10% increase in the money supply. This would require a \$6 billion increase in the money supply, rather than a \$3 billion increase. Using a money multiplier of $m = 3$, this implies that the Fed would need to increase reserves to \$12 billion. This could be accomplished by purchasing government securities and injecting \$2 billion in reserves into the banking system.

#23. (30 pts) Consider the following short-run model of the economy.

Goods Market	Money Market
$C = 100 + 0.5(Y - T)$	$M = 4000$
$I = 50 - 2r$	$P = 10$
$G = 200; T = 100$	$L(Y, r) = Y - 6r$

(a) (10 pts) Graph the IS and LM equations. Be sure to label the axes and curves.

IS Equation

$$Y = C + I + G$$

$$Y = 100 + 0.5(Y - 100) + 50 - 2r + 200$$

$$0.5Y = 300 - 2r$$

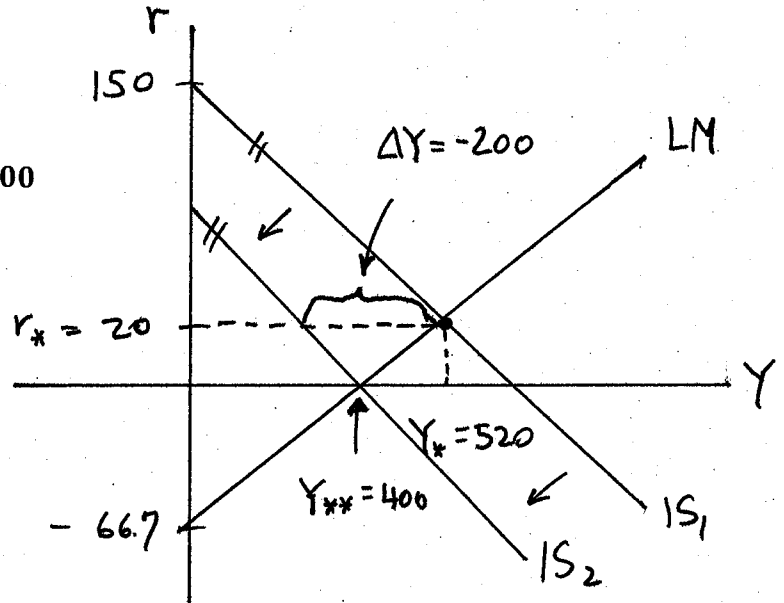
$$Y = 600 - 4r$$

LM Equation

$$M/P = L(Y, r)$$

$$400 = Y - 6r$$

$$Y = 400 + 6r$$



(b) (5 pts) Find the equilibrium values for r and Y . Show these values on the graph.

Setting IS equal to LM gives: $600 - 4r = 400 + 6r$. Solving for r gives $r_* = 20$ and $Y_* = 520$.

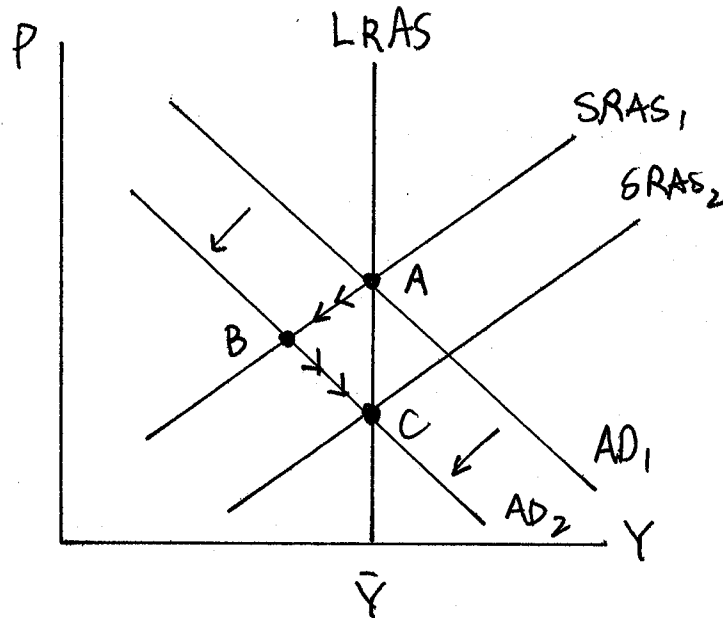
(c) (15 pts) Assume the federal government reduces spending to balance the budget. Show the shift on your graph in (a), the new equilibrium, and the Keynesian-cross multiplier. Calculate the 'effective' IS-LM multiplier and explain why the equilibrium reduction in output was less than the value implied by the Keynesian-cross multiplier.

The federal government would need to reduce spending to $G = 100$ to balance the budget. The Keynesian-cross government spending multiplier is two. Therefore, the IS curve will shift to the left by 200 units. The new IS-LM equilibrium values are $r_* = 0$ and $Y_* = 400$. The reduction in output is 120 units, so the IS-LM multiplier is $120/100 = 1.2$. The IS-LM multiplier is smaller because interest rates fell to equilibrate the money market, which in turn spurred on some additional investment.

#24. (30 pts) AD-SRAS-LRAS model of the economy. Assume the SRAS curve is upward sloping.

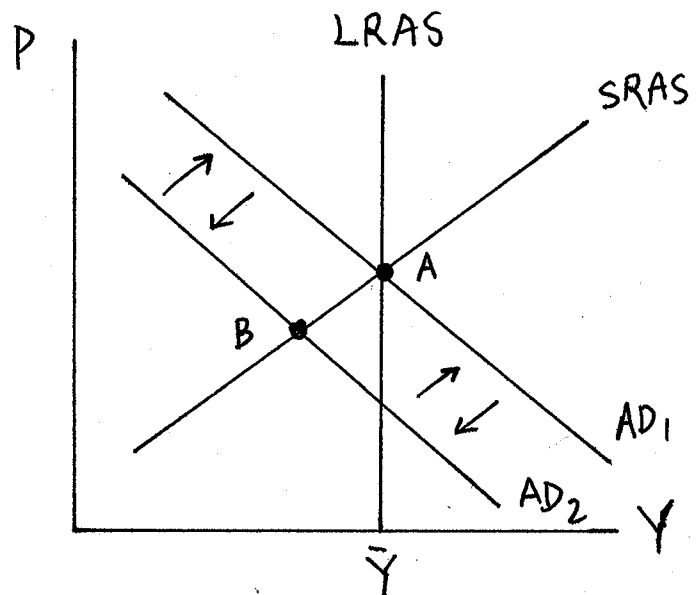
- (a) (15 pts) After years of quantitative easing, the Fed has gradually been moving toward a more normal level of interest rates and money growth. Describe in words how the FOMC has accomplished this and how the new policy is predicted to impact the price level, real GDP and unemployment both in the short and long run. Use a diagram to support your explanation.

The FOMC has accomplished a move toward a ‘normalization’ of monetary policy by gradually raising interest rates and slowing money growth. They do this by either selling government securities (or at least slowing the growth in purchases). Assume this type of contractionary policy shifts the AD curve inward. In the short run, the economy would move from point A to B with a decrease in the price level and real GDP. The unemployment rate would increase. Over time, firms would lower prices, causing the SRAS to shift down until the economy returned to full employment at point C.



- (b) (15 pts) Now assume you are an economic advisor to President Trump, such as Treasury Secretary Mnuchin. The most recent labor market figures have the unemployment rate at 4.4%. The ‘contractionary’ monetary policy described above may cause unemployment to rise and will make it difficult to achieve a 2% inflation target. What policy would you recommend to the President? Use an AD-AS diagram to support your recommendation.

There are a lot of possible policy recommendations, including doing nothing. One possible fiscal policy response is to counteract the ‘contractionary’ monetary policy by either increasing government spending and/or a decreasing taxes. This would cause the AD to shift back to its original position and maintain an equilibrium at point A. The result of the fiscal policy would be to effectively undo the contractionary monetary policy by the Fed.



#25. (20 pts) True or False. If “False”, correct the statement to make it true.

(a) (5 pts) “The overall level of federal debt is approximately 10% of GDP.”

FALSE. The overall level of federal debt is approximately 100% of GDP.

(b) (5 pts) “Robots and automation are the main cause of the recent decline in the U.S. labor force participation rate.”

FALSE. Retirement of the baby-boomers is the main cause of the recent decline.

(c) (5 pts) “Active monetary policy is an effective means to guide both short-run and long-run aggregate production.”

FALSE. Monetary policy can manipulate GDP in the short run, but the long-run rate of production is determined by labor supply, capital, and production technology.

(d) (5 pts) “Mexico is one of the top two international holders of U.S. federal debt.”

FALSE. The top two international holders of U.S. debt are China and Japan.