

Name \_\_\_\_\_ Student ID \_\_\_\_\_

Section day and time \_\_\_\_\_

### Final Exam - Economics 101 (Fall 2009)

You will have 120 minutes to complete this exam. There are 105 points and 7 pages

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**Multiple Choice:** (20 points total, 2 points each) Choose best answer and record in blanks below.

1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ 7 \_\_\_\_\_ 8 \_\_\_\_\_ 9 \_\_\_\_\_ 10 \_\_\_\_\_

- 1) In the long run, the overall level of production in our economy depends upon:
  - a) the supply of labor
  - b) the supply of capital
  - c) technology level
  - d) all of the above
- 2) Which of the following could explain a rise in the natural rate of unemployment in the U.S.?
  - a) a cut in government spending
  - b) a rise in money supply
  - c) a rise in the minimum wage
  - d) a cut in unemployment benefits
- 3) If China has a higher saving rate than the U.S. (and the same rates of depreciation and population growth, and same production technology), this implies that in the very long run China would necessarily have a higher level of \_\_\_\_\_ than the U.S.:
  - a) GDP per person
  - b) consumption per person
  - c) both (a) and (b)
  - d) neither (a) nor (b)
- 4) If the economy is experiencing a recession and interest rates are falling, which of the following shocks could be causing the recession, according to the IS-LM model:
  - a) rise in government spending
  - b) fall in money supply
  - c) rise in exogenous real money demand
  - d) fall in exogenous investment expenditure
- 5) If US money growth rises 3% and output growth rises 2 %, then according to the Quantity Theory and the Fisher relation, the nominal interest rate in the U.S. should
  - a) rise 5%
  - b) rise 1%
  - c) not change
  - d) fall 1%
  - e) fall 5%.
- 6) The Phillips Curve says that if fiscal stimulus is used to lower unemployment below its normal long-run level, this comes at the cost of
  - a) higher output
  - b) lower output
  - c) higher inflation
  - d) lower consumption
- 7) Suppose a country has the following Phillips curve:  $\pi = \pi^e - 2(u - u^n)$ . If expectations are rational, what is the “sacrifice ratio” in terms of unemployment (assuming that we are starting at the natural rate of unemployment)?
  - a) 4
  - b) 2
  - c) 0
  - d) 0.5
  - e) 0.25
- 8) The “sticky nominal wage” model of aggregate supply implies:
  - a) The real wage tends to fall when GDP rises.
  - b) The short-run aggregate supply curve is upward sloping.
  - c) A rise in price level lowers the real wage.
  - d) All of the above.

- 9) In the Keynesian Cross model, if government spending is raised by \$100 million, income must
- rise by more than \$100 million.
  - rise by \$100 million.
  - rise by less than \$100 million.
  - rise, but it is not clear how much
- 10) A lesson from the Dynamic DAD-DAS model is that in order for the Federal Reserve to maintain a stable inflation rate, its monetary policy rule setting the nominal interest rate must respond:
- strongly to the output gap.
  - strongly to inflation.
  - weakly to inflation.
  - weakly to the real interest rate

**Problem 1: IS/LM in the Short Run** (20 points total)

Suppose the government wishes to stimulate GDP by \$1 billion in the short run, and is trying to decide between using either monetary policy or fiscal policy (in particular, a tax cut).

- (8 points) Draw a separate IS-LM diagram for each of these policies in the short run; label the policy above each graph. Be sure to label the axes, the curves, and use arrows showing the direction the curves shift. Also mark the initial equilibrium as point '1', and the short-run equilibrium as point '2'. Explain each curve shift briefly. (Make the usual IS-LM assumptions: prices are completely fixed in the short run. Investment is just the usual function of the interest rate alone; consumption is a function of disposable income alone, with a constant marginal propensity to consume.)

- (6 points) Discuss in a few sentences the differences in the effects of the two policies on the real interest rate and total national saving (sum of private plus government saving). If the government's goal were to raise GDP by the \$1 billion amount, while keeping national

saving as high as possible (since it is already very low in the U.S.), which policy would be the better choice? Explain your reasoning in a few sentences.

- c) (6 points) Suppose that in this economy, the real money demand behavior were less responsive to the interest rate than you assumed in parts (a) and (b) above. How would this change the slopes of the curves?
- \_\_\_\_: slope of IS curve      a) steeper    b) flatter    c) same      d) ambiguous
- \_\_\_\_: slope of LM curve      a) steeper    b) flatter    c) same      d) ambiguous
- How would the tax cut discussed above that is designed to raise output the desired \$1 billion amount affect the following variables differently than above?
- \_\_\_\_: interest rate:      a) more      b) less      c) same      d) ambiguous
- \_\_\_\_: investment:      a) more      b) less      c) same      d) ambiguous
- \_\_\_\_: total national saving:      a) more      b) less      c) same      d) ambiguous
- Does this money demand behavior make the tax cut more or less attractive as a policy tool for this economy?
- \_\_\_\_:      a) more      b) less      c) same      d) ambiguous

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**Problem 2: Short Run and Long Run** (25 points total)

Suppose we are experiencing a recession due to a shock to the money demand function that permanently raises real money demand for a given interest rate. Use the IS-LM / AS-AD tools to analyze the implications in the short run and the long run.

(Make the usual IS-LM assumption: Prices are completely fixed in the short run and completely flexible in the long run. Assume there is no change in government spending. Investment is a function only of the interest rate, consumption only a function of disposable income with a constant marginal propensity to consume, nominal money supply is exogenous.

- a) (10 points) Draw the IS-LM and AS-AD graphs to show the short run and long run equilibria following this shock. Assume that prices are completely fixed in the short run. Be sure to label the axes, curves, use arrows to show shifts in curves, and mark the equilibrium points: 1 for the initial equilibrium, 2 for the short run equilibrium, and 3 for the long-run equilibrium. Explain in a sentence or two each curve shift.

b) (6 points) What happens to the following real variables in the short run?

- |                           |         |         |              |              |
|---------------------------|---------|---------|--------------|--------------|
| ____: real GDP:           | a) rise | b) fall | c) no change | d) ambiguous |
| ____: real interest rate: | a) rise | b) fall | c) no change | d) ambiguous |
| ____: investment:         | a) rise | b) fall | c) no change | d) ambiguous |
| ____: real money demand   | a) rise | b) fall | c) no change | d) ambiguous |
| ____: nominal GDP         | a) rise | b) fall | c) no change | d) ambiguous |
| ____: real money supply   | a) rise | b) fall | c) no change | d) ambiguous |

c) (6 points) Consider the value that each of the variables goes to in the long run -- is this long-run value the same as the initial level before the shock (point 1 on your graphs), will it end up higher in the long run than its initial level, will it end up lower, or is this ambiguous for the given information.

- |                           |                    |           |          |              |
|---------------------------|--------------------|-----------|----------|--------------|
| ____: real GDP:           | a) same as initial | b) higher | c) lower | d) ambiguous |
| ____: real interest rate: | a) same as initial | b) higher | c) lower | d) ambiguous |
| ____: investment:         | a) same as initial | b) higher | c) lower | d) ambiguous |
| ____: price level         | a) same as initial | b) higher | c) lower | d) ambiguous |
| ____: nominal GDP         | a) same as initial | b) higher | c) lower | d) ambiguous |
| ____: real money supply   | a) same as initial | b) higher | c) lower | d) ambiguous |

- d) (3 points) Will the recession created by this permanent shock be permanent? Discuss in a couple sentences how the money market responds differently in the long run than in the short run to this permanent shock.

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**Problem 3: Neoclassical Model** (25 points total)

Suppose the real side of the U.S. macroeconomy is characterized as follows. **Note that consumption depends upon the interest rate here rather than investment.**

Production:	$Y = 10 K^{1/2} L^{1/2}$	
Factor supply:	$K = 100$	$L = 100$
Government:	$G = 200$	$T = 200$
Consumer behavior:	$C = 400 + 0.5(Y-T) - 2000r$	
Investment behavior:	$I = 200$	

Suppose the nominal side of the economy is characterized by the following:

Quantity theory of money:	$MV = PY$	where $V=4$
Nominal money supply:	$M = 500$	

(Y is real GDP, K capital, L labor, G government purchases, T taxes, C consumption, I investment, r real interest rate, P price level, M money supply, V velocity.)

- a) (12 points) Compute the equilibrium levels of the following variables:  
real interest rate, consumption, price level, real wage  
Show your work, and be careful about mathematical accuracy.

- b) (5 points) Suppose that there is a cut in government spending. What effect will this have on the variables listed below? No computations necessary; no explanation required.
- |                           |         |         |              |              |
|---------------------------|---------|---------|--------------|--------------|
| ____: real GDP:           | a) rise | b) fall | c) no change | d) ambiguous |
| ____: real interest rate: | a) rise | b) fall | c) no change | d) ambiguous |
| ____: consumption:        | a) rise | b) fall | c) no change | d) ambiguous |
| ____: private saving      | a) rise | b) fall | c) no change | d) ambiguous |
| ____: national saving     | a) rise | b) fall | c) no change | d) ambiguous |
- c) (5 points) Suppose that there is a rise in nominal money supply. What effect will this have on the variables listed below? No computations necessary; no explanation required.
- |                    |         |         |              |              |
|--------------------|---------|---------|--------------|--------------|
| ____: real GDP:    | a) rise | b) fall | c) no change | d) ambiguous |
| ____: price level  | a) rise | b) fall | c) no change | d) ambiguous |
| ____: nominal GDP  | a) rise | b) fall | c) no change | d) ambiguous |
| ____: real wage    | a) rise | b) fall | c) no change | d) ambiguous |
| ____: nominal wage | a) rise | b) fall | c) no change | d) ambiguous |
- d) (3 points) Does the “classical dichotomy” hold in this economy? Explain what this means.

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**Problem 4: Solow Growth Model:** (15 points total)

Suppose an economy can be characterized by the production function:  $y = f(k) = 2k^{0.5}$ , which already is in per worker terms, where  $k = K/L$ . Suppose the depreciation rate is 7%, the saving rate is 10%, the population growth rate is 3%. Assume there is no technological progress.

- a) (9 points) Using the Solow growth model, compute the steady state values of:
- capital per person,
  - output per person, and
  - the real rental rate on capital.

b) (6 points) Suppose the country implements a policy that lowers the population growth rate from 3% to 1%. What would happen to the values of the following:

\_\_\_\_: steady state output per person (a) rise (b) fall (c) no change d) ambiguous

\_\_\_\_: steady state consumption per person  
(a) rise (b) fall (c) no change d) ambiguous

\_\_\_\_: steady state real rental rate on capital  
(a) rise (b) fall (c) no change d) ambiguous

\_\_\_\_: current growth rate in output per person  
(a) rise (b) fall (c) no change d) ambiguous

\_\_\_\_: steady state growth rate in output per person  
(a) rise (b) fall (c) no change d) ambiguous

\_\_\_\_: steady state growth rate in total output (not per person)  
(a) rise (b) fall (c) no change d) ambiguous

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12/8/09