Intermediate Macroeconomic Theory /
Macroeconomic Analysis
(ECON 3560/5040)
Final Exam

Part A (15 points)

State whether you think each of the following questions is true (T), false (F), or uncertain (U) and briefly explain your answer. No credit will be given for an answer without any explanation.

(1) [5 points] Staggering makes the overall level of wages and prices adjust quickly, because individual wages and prices change frequently.

(2) [5 points] If Congress raises taxes, the response of the economy to the tax increase depends on how the central bank responds.

(3) [5 points] The Mundell-Fleming model shows that a fiscal policy is more effective than a monetary policy.

Part B (15 points)

Briefly answer the following questions in words.

(1) [5 points] Can an IS curve be vertical? Give an example.

(2) [5 points] What is an advantage to fixed exchange rates?

(3) [5 points] Why do firms have motives for holding inventories of goods? Give an example.
Part C (70 points)

(1) [14 points] IS-LM Model

Assume the following model of the closed economy in the short run, with the price level \( P \) fixed at 1.0:

\[
\begin{align*}
C &= 0.5(Y - T) \\
T &= 1,000 \\
I &= 1,500 - 250r \\
G &= 1,500 \\
\frac{M^d}{P} &= 0.5Y - 500r \\
M^s &= 1,000
\end{align*}
\]

(a) [2 points] Write a numerical formula for the IS curve, showing \( Y \) as a function of \( r \) alone [Hint: Substitute out \( C, I, G, \) and \( T \)]

(b) [2 points] Write a numerical formula for the LM curve, showing \( Y \) as a function of \( r \) alone [Hint: Substitute out \( M/P \)]

(c) [2 points] What are the short-run equilibrium values of \( Y, r, \) and national saving \( (S) \)?

(d) [2 points] Assume that \( G \) increases by 1,500 (i.e., \( G = 3,000 \)). By how much will \( Y \) increase in short-run equilibrium?

(e) [3 points] You are the chief economic adviser in this hypothetical economy. Do you believe that fiscal policy is more potent than monetary policy? Briefly discuss [Hint: Use the slope of IS and LM curve in (a) and (b)]

(f) [3 points] Write the numerical aggregate demand \( (AD) \) curve for this economy, expressing \( Y \) as a function of \( P \)

(2) [10 points] Classical models in the Long Run

During early 1980s, President Reagan proposed to increase defense spending and decrease taxes. Table 1 shows how the policies affected the U.S. economy. Use the Classical Model to answer the following questions

(a) [3 points] Use the closed economy model and illustrate graphically how the model predicts national saving \( (S) \), investment \( (I) \), real interest rate \( (r) \), net export\( (NX) \), and real exchange rate \( (\varepsilon) \) in the long run

(b) [2 points] Are the data in the table consistent with model predictions that you found in part (a)? Briefly discuss
Table 1: The Reagan Deficits

<table>
<thead>
<tr>
<th>variable</th>
<th>1970s</th>
<th>1980s</th>
<th>actual change</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S$</td>
<td>19.6</td>
<td>17.4</td>
<td>↓</td>
</tr>
<tr>
<td>$I$</td>
<td>19.9</td>
<td>19.4</td>
<td>no change</td>
</tr>
<tr>
<td>$r$</td>
<td>1.1</td>
<td>6.3</td>
<td>↑</td>
</tr>
<tr>
<td>$NX$</td>
<td>-0.3</td>
<td>-2.0</td>
<td>↓</td>
</tr>
<tr>
<td>$\varepsilon$</td>
<td>115.1</td>
<td>129.4</td>
<td>↑</td>
</tr>
</tbody>
</table>

Data: decade averages; all except $r$ and $\varepsilon$ are expressed as a percent of GDP

(c) [3 points] Now use the small open economy model and illustrate graphically how the model predicts national saving ($S$), investment ($I$), real interest rate ($r$), net export ($NX$), and real exchange rate ($\varepsilon$) in the long run.

(d) [2 points] Are the data in the table consistent with model predictions that you found in part (c)? Briefly discuss.

(3) [6 points] Open Economy in the Short Run

Economic expansion throughout the rest of the world raises the world interest rate. Use the Mundell-Fleming ($IS^* - LM^*$) model to illustrate graphically the impact of an increase in the world interest rate ($r^*$) on the nominal exchange rate ($e$) and level of output ($Y$) in a small open economy with a floating-exchange-rate system.

(4) [10 points] The Model of AD and AS

Assume that an economy is initially operating at the natural rate of output ($Y^*$). A short-run aggregate supply equation is given by

$$Y_t = \bar{Y} + \alpha(P_t - P^*_t),$$

where $Y$ is output, $P$ is the price level, $P^*$ is the expected price level, and $\alpha > 0$.

(a) [2 points] What is the slope of the aggregate supply curve?

(b) [3 points] According to the sticky-price model, the value of $\alpha$ depends on the fraction of firms with sticky prices. Other things being equal, if a greater proportion of firms follows the sticky-price rule, what happens to the slope of the AS curve?

(c) [5 points] Use the model of aggregate demand and aggregate supply to illustrate graphically the short-run and long-run effects on price and output of an unexpected expansionary monetary policy change.
(5) [10 points] The Phillips Curve
Suppose that an economy has the Phillips curve
\[ \pi_t = \pi^c_t - 0.5(u_t - 0.06) \]

(a) [2 points] What is the natural rate of unemployment \((u^n)\)?

(b) [4 points] Use the Phillips curve diagram to illustrate graphically how the inflation rate \((\pi)\) and unemployment rate \((u)\) change in the short run to an unexpected expansionary monetary policy.

(c) [4 points] Use the Phillips curve diagram to illustrate graphically how the inflation rate \((\pi)\) and unemployment rate \((u)\) change in the short run to an expected expansionary monetary policy.

(6) [10 points] Consumption Theories
(a) [3 points] What were Keynes’s three conjectures about the consumption function?

(b) [2 points] What is the consumption puzzle?

(c) [3 points] How does the Permanent Income Hypothesis (PIH) resolve the puzzle?

(d) [2 points] Demographers predict that the fraction of the population that is elderly will increase over the next 20 years. What does the Life-Cycle Hypothesis (LCH) predicts for the influence of this demographic change on the national saving rate? That is, will the national saving rate increase or decrease? Why?

(7) [10 points] Money Supply and Inflation
To increase tax revenue, the US government in 1932 imposed a two-cent tax on checks written on deposits in bank accounts (In today’s dollars, this tax was about 25 cents per checks)

(a) [2 points] How do you think the check tax affected the currency-deposit ratio? Briefly explain.

(b) [2 points] Briefly discuss how this tax affected the money supply using the model of the money supply under a fractional-reserve banking system.

(c) [3 points] Now use the IS – LM model to discuss the impact of this tax on the economy in the short run. Was the check tax a good policy to implement in the middle of the Great Depression?

(d) [3 points] Explain how this tax influenced nominal interest rates and inflation rates in the long run using the Quantity Theory of Money (QTM) and the Fisher effect.
Part D (10 points)

If you are a Graduate student, you should answer the following questions. This is a bonus question for Undergraduate Students

(8) [10 points] Suppose that the central bank strictly followed a rule of keeping the real interest rate at 3% per year. That rate happens to be the real interest rate consistent with the economy’s initial equilibrium

(a) [5 points] Assume that the economy is hit by a money demand shock only. Under the central bank’s rule, how will the money supply respond to a money demand shock? Will the rule make aggregate demand more stable or less stable than it would be if the money supply were constant?

(b) [5 points] Assume that the economy is hit by IS shocks only. Under the central bank’s rule, how will the money supply behave? Will the interest-rate rule make aggregate demand more stable or less stable than it would be if the money supply were constant?