Final Exam. Econ520. Fall 2024

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UNC

Instructions:

- Answer all questions.
- Write legibly.
- Write your answers on the question sheets. Use additional pages, if needed.
- *Explain* your answers – do not just state them.
- *Show* your derivations – do not just state the final result.
- Do not refer to any notes or books. You may use a calculator.
- The total time is **180** minutes. The total number of points is **120**.

Name:	PID:

1 Short Questions: Closed Economy

Be sure to explain your answers. No models are required.

1. [10 points] Suppose the Fed raised its **inflation target** permanently to 5 percent per year. What changes would you expect in the long run? Explain. (Ignore possible real world complications such as tax brackets that are specified in nominal terms.)

   Answer

   Inflation would rise. Nominal interest rates would rise. All real variables would remain unchanged. Money is neutral in the long run.

   Intuition: Money has real effects only if it generates unanticipated inflation. Anticipated inflation is built into wage and price adjustments each year.

   Also useful: the Phillips Curve $\pi - \pi^e = m + z - \alpha u$. Anticipated inflation does not change employment.

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2. [10 points] The **Phillips Curve** implies that rising inflation expectations need to be "validated" through higher inflation. Otherwise unemployment will rise. Explain the intuition.

   Answer

   Full employment requires that price expectations are correct. If prices fall short of expectations, we get unemployment. One story: workers perceive a low real wage.

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3. [10 points] Comment on the following statement: "If the government budget deficit rises today, the government has to either raise taxes or cut expenditures in the future." Think r versus g.

   Answer

   The answer depends on r versus g.

   The key constraint is that the ratio of debt to output has to be prevented from growing above an unknown upper bound. If all interest is rolled over, debt grows at rate r and debt/output grows at rate $r - g$.

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2 Short Questions: Open Economy

Be sure to explain your answers. No models are required.

1. [10 points] Comment on the following quote by Robert Scott: "While growing exports tend to support domestic employment, growing imports costs jobs and reduces domestic output." Think of the quote as referring to the medium run.

   Answer

   In the medium run, employment has little to do with the trade balance (exports or imports). It is determined by supply factors instead (worker preferences, productivity, work incentives).

   There is also a logic issue: exports and imports are endogenous variables. It does not make logical sense to ask how growing exports affect employment (or anything else). What happens depends on the why exports are growing. It is the underlying shock that may or may not cause employment to change.

   Example: A positive labor supply shock increases employment. It will also likely raise imports because imports depend on Y via a simple income effect. In this case, employment and imports move together.

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2. [10 points] Suppose that the Chinese government implements policies that increase the saving rate of Chinese households. Explain why this policy might lead to a larger U.S. trade deficit? You need to explain what market adjustments change U.S. savings or investment.

   Answer

   Start from $Y - C - T + (T - G) + (IM - EX) = I$. If private saving $(Y - C - T)$ rises in China without a corresponding increase in investment, the Chinese trade balance goes into surplus (which is exactly what we have observed between 2000 and 2010).

   Since world trade is balanced, some other country must end up running a trade deficit. How might that come about?

   The "global savings glut" shows up as demand for U.S. assets (especially treasuries), which pushes up the dollar exchange rate, drives down U.S. interest rates, stimulates U.S. investment, and contributes to the U.S. trade deficit (with China).

   That last part is key. The U.S. trade deficit only rises if something alters U.S. saving or investment (here: lower interest rates).

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3. [10 points] Explain why the central bank loses control over the money supply under fixed exchange rates. Explain why this can be an advantage for some countries.

   Answer

The CB buys or sells foreign currency at the fixed exchange rate in whatever quantity is needed to clear the market. Each time the CB buys FX it sells dollars (in the form of credits in accounts that banks hold with the Fed). The money supply rises.

Were the Fed to deviate from whatever money supply is required to fix the exchange rate, capital flows would undo the action. For example, if the Fed tries to expand the money supply such that $i < i^*$, capital outflows put pressure on the exchange rate. The Fed must undo the pressure by buying dollars and selling FX. That contracts the money supply until $i = i^*$ is restored.

Why could the loss of monetary autonomy be a benefit? If a central bank has trouble keeping inflation in check, the fixed exchange rate serves as a disciplining device.

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4. [10 points] Suppose the U.S. opens up **trade with a low wage country**. What do you expect to happen to U.S. real wages? How do U.S. workers gain from trade? And how does the answer depend on the mobility of workers across sectors?

Answer

Even with trade, workers are paid marginal value products. For any good that we produce, the real wage (in terms of that good) is unaffected by trade.

How then are overall real wages affected? We import goods that are cheaper to import than to produce at home. Hence, the prices of import goods fall relative to wages. Real wages rise (that is: wages divided by a price index rise).

But if workers cannot exit import competing sectors, those workers will see a decline in their real wages (because imports get cheaper).

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3 Floating: Rising Saving Rate

The U.S. has run a large and growing trade deficit for many years. Consider the proposal to fix the trade deficit by increasing the household saving rate.

The environment is an open economy with a floating exchange rate. The model equations are:

IS:

$$Y = C\left(Y - T\right) + I\left(Y, i\right) + G + NX\left(Y, Y^*, \frac{P}{EP^*}\right) \tag{1}$$

LM:

$$M/P = Y \times L\left(i\right) \tag{2}$$

AS:

$$Y = F\left(\frac{P}{P^e}\frac{1}{1+m}, z\right) \tag{3}$$

UIP:

$$E = E^e\frac{1+i^*}{1+i} \tag{4}$$

Recall that we combine IS + LM + UIP into AD:

$$Y = C\left(Y - T\right) + I\left(Y, \hat{L}\left(\frac{M}{PY}\right)\right) + G + NX\left(Y, Y^*, \frac{P}{E^eP^*}\frac{1+\hat{L}\left(\frac{M}{PY}\right)}{1+i^*}\right) \tag{5}$$

Questions

1. [5 points] The graph below shows the implications of a **permanent increase in the saving rate**. A higher saving rate may be modeled as an exogenous drop in C for given disposable income $Y - T$. Explain precisely why this graph describes how a higher saving rate affects the short-run and medium-run equilibrium. Explain which curves shift and why. Additional explanations are deferred to the following sub-questions.

   Answer

   This is a standard AS/AD diagram. A higher saving rate (lower C) shifts the AD curve left. The SR equilibrium has lower Y and P. The MR equilibrium h1as even lower P but unchanged $Y = Y_n$.

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2. [15 points] Derive what happens in the **medium run** to consumption, investment, the interest rate, the exchange rate, M/P, and net exports. Be sure to follow the model's logic and support your conclusions with the model equations.
   Explain in words how a higher saving rates affects the trade balance in the MR.

   Answer

   MR: $Y = Y_n$ and $P \downarrow$ from the graph.

   Interest rate: $\frac{M}{PY} \uparrow = L(i \downarrow)$.

   Therefore $I \uparrow$ and $C \downarrow$ and $E \uparrow$ (dollar depreciates).

   Trade balance: $NX \uparrow$ because $P \downarrow, E \uparrow$.

   In words: the trade balance improves b/c our goods get cheaper in world markets. If consumers eat less, there is excess supply of goods in the domestic market. Prices must fall. That causes the usual rise in I which absorbs some of the decline in consumption. The rest of the excess supply gets exported (at reduced prices).

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3. [8 points] Derive what happens in the **short run** to the same variables.

   Answer

   SR: $Y \downarrow$ and $P \downarrow$ from the graph.

   Interest rate: $\frac{M}{PY} \uparrow = L(i \downarrow)$.

   Therefore I ambiguous, $C \downarrow$, and $E \uparrow$ (dollar depreciates).

   Trade balance: $NX \uparrow$ because $P \downarrow, E \uparrow$ and $Y \downarrow$.

   Intuition:

   - lower C implies lower AD

- prices and output must fall to clear the goods market
- money demand declines; people buy bonds, causing $i \downarrow$
- capital outflows cause dollar depreciation
- cheaper US goods in world markets (and lower import demand due to $Y \downarrow$) improve NX

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4. [10 points] Explain in words how the economy returns to full employment during the transition from SR to MR. What causes aggregate demand to rise along the transition?

   In your answer, assume that i falls during the transition (you should explain why). (Strictly speaking, the change in i along the transition is ambiguous, but you should ignore this problem.)

   Answer

   Transition to MR: We are just explaining what happens when we move south-east along the AD curve.

   - price expectations fall; in our model, this means that wages fall, allowing firms to charge lower prices
   - AD rises directly b/c P is lower: $NX \uparrow$
   - in addition: lower prices mean that people need less money. They buy bonds, which lowers i. However, output also rises, which makes the change of i ambiguous.
   - lower i leads to dollar depreciation which further raises NX
   - it also crowds in I

   So there are 3 reasons why AD rises.

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5. [12 points] What do you think would happen in the medium run if the saving rate rises in **both** countries (home and foreign)? To keep things simple, assume that the two countries are identical. How would balanced trade be restored?

   Answer

   The rise of our saving rate affects the foreign country in two ways:

   (a) Lower i depreciates the dollar. Foreign NX rise.

   (b) Lower P directly worsens foreign NX.

   If the two countries are identical, we must end up with balanced trade again. How?

   In a nutshell, higher foreign saving reduces i^*, restoring $i = i^*$ so that E stays unchanged. It also lowers foreign prices P^* so that P/P^* don't change. That means the real exchange

rate stays unchanged. In the MR, output is at full employment (also unchanged). Therefore, NX don't change because NX depends on (Y, Y^*, ε).

The story now plays out pretty much as in a closed economy. The higher saving rate lowers the interest rate. Consumption falls, but investment rises, keeping output at full employment.

This answer makes sense. If the two countries implement policies that cancel out each other's effects on NX, then the contribution of trade to AD is zero. Everything plays out like in a closed economy.

Here is another potential answer:

When the domestic saving rate rises, i and P both fall. The dollar depreciates. A negative demand shock. When foreign savings rise, the dollar appreciates and P^* falls. These changes offset the initial change in NX.
