Final Exam. Econ520. Spring 2023

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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: Methods and Growth

1. [12 points] The data show a "**reversal of fortunes**" for former colonies: countries that were rich in 1500 and poor today. How does this evidence support the case that institutions are important sources of cross-country income variation?

   Answer

   Reversal of fortunes: Among colonies, we see a negative relationship between incomes in 1500 and incomes and institutions today. The argument: In low income colonies, population density was low. The only profitable strategy was to settle. Thus, institutions were put in place that protect the rule of law and individual rights. In high income colonies, slavery was the most profitable strategy. Hence, dictatorial institutions were put in place.

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2. [12 points] **Instrumental variables** (IV) are an important approach for estimating cause-effect relationships. Suppose that a researcher proposes to estimate the effect of tax rates on output growth using cross-sectional data for many countries. They propose a two step approach.

   Step 1: Regress tax rates in 2000 on tax rates in 1960 (the instrument) (and controls).

   Step 2: Regress output growth 2000 to 2020 on predicted year 2000 tax rates (and controls).

   What would have to be true for the step 2 coefficient to estimate the causal effect of taxes on growth?

3. Consider the **Solow model**, described by the law of motion for capital per worker

$$\dot{k}(t) = sk(t)^{\alpha} A^{1-\alpha} - (n+\delta) k(t)$$

   (a) [10 points] Show graphically that a higher saving rate leads to higher steady state k.

   (b) [8 points] Do you expect the change in steady state k to be larger or small when α is high? Explain the intuition (you need not graph this).

   (c) [5 points] What is the one key feature of the Solow model that implies that higher saving cannot permanently raise the growth rate?

2 Short Questions: Open Economy

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

1. [10 points] China has experienced high productivity growth over the past decades. Do you think this benefits or hurts the U.S. economy? Do you think it affects our trade deficit? Explain.

2. Consider the following quote:

   "Senior Fellow Brad Setser ... writes that there is still an East Asian "savings glut," in which exceptionally high savings rates in the region ... drive large trade surpluses, which must be absorbed by deficit countries, like the United States."

   (a) [7 points] Explain how a "savings glut" leads to a trade surplus.

   Answer

   $I = S^P + S^G + NX$. Very high S/Y (private or public) are either absorbed by high I/Y or exported abroad as a trade surplus.

   (b) [7 points] What is the mechanism through which the foreign savings glut generates domestic trade deficit?

   Answer

   Excess savings become capital outflows (foreign asset purchases).

   One channel: The demand for dollars causes an appreciation, which hurts the US trade balance.

   A second channel: Foreigners buy US bonds, driving down US interest rates. This causes an expansion in the US, causing us to buy more foreign goods.

3. [12 points] In early 2022, the Turkish Central Bank lowered official interest rates. The goal was two-fold: reduce inflation; and cause a devaluation of the Turkish currency, which would cause a trade surplus and thereby stimulate demand.

   What do you expect the lower interest rate will do?

   Answer

   Inflation will certainly rise. Lower interest rates cause a domestic expansion (AD rises). This creates inflation by standard AS/AD logic. Moreover, the Turkish currency will depreciate (think UIP), which will cause more inflation via more expensive imports.

   Trade balance: The policy may work. The devaluation might improve the trade balance. But it's not so clear. There is likely no effect on S/Y (though the policy is expansionary, which may cause a fall in S/Y). The expansion will likely raise I/Y. Then NX/Y must fall.

3 Open economy AS/AD

Consider the consequences of an adverse supply shock in an open economy with fixed exchange rates.

Specifically, assume that the economy starts in the full employment medium run equilibrium. Then $m \uparrow$ permanently.

Recall the model equations:

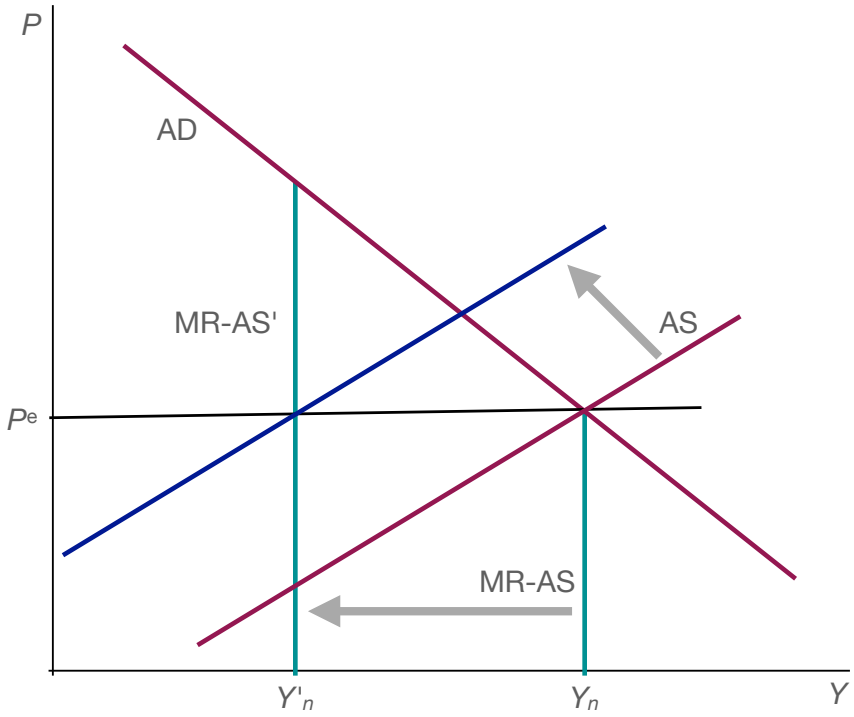
$$UIP: i = i^* \tag{1}$$
$$LM: M/P = YL(i) \tag{2}$$
$$AD: Y = C(Y-T) + I(Y,i) + G + NX(Y, Y^*, \bar{E}P/P^*) \tag{3}$$
$$AS: Y = F\left(\frac{1}{1+m}\frac{P}{P^e}, z\right) \tag{4}$$

Questions:

1. [9 points] Graph the medium run equilibrium. Explain what curves you graph and how they relate to the model equations. Clearly explain which curves shift and why.

   Answer

   The graph ends up looking like a closed economy supply shock:



We graph AS and AD with fixed $i = i^*$. We don't worry about LM b/c that just determines M.

MR-AS shifts left b/c the m shock is permanent. AS shifts left b/c m rises. As always, AS intersects MR-AS where $P = P^e$. AD does not shift (it's a supply shock).

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2. [9 points] Explain how consumption, investment, net exports, and the money supply change.

Answer

$C(Y - T) \downarrow$, $I(Y, i^*) \downarrow$. NX seems ambiguous at first, but it actually falls (b/c prices rise). This is how higher prices reduce AD in this model. $M/P \downarrow$ from LM (but we cannot tell whether M rises or falls).

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3. [7 points] Graph the short run equilibrium in the same figure. Clearly explain which curves shift and why. Pay attention to the location of the short run AS curve.

Answer

For which curves shift, see above.

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4. [5 points] Explain how the same variables change in short run.

Answer

The changes in the variables are the same as in the MR, but smaller (b/c the shift in AS is smaller).

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5. [9 points] Explain what happens along the transition from short run to medium run.

Answer

$P^e \uparrow$ shifts AS up. Prices rise. Output falls b/c the real exchange rate appreciates ($NX \downarrow$). That causes declines in C and I. Higher prices and falling output change the interest rate (direction not clear). The Fed adjusts M to keep $i = i^*$.

End of exam.