

# Final Exam. Econ520. Spring 2021

Professor Lutz Hendricks

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 also **180**.

|       |      |
|-------|------|
| Name: | PID: |
|-------|------|

# 1 Short Questions: Closed Economy

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

1. [9 points] In most of the models that we considered, aggregate demand plays an important role. But in the growth models, we never even wrote down a demand side. Explain why this makes sense.

**Answer:** One of the key insights from the short/medium run models is that supply determines medium run output. Demand just determines prices.

Why is this? Mechanically, it happens because price expectations catch up with actual prices and then the supply curve becomes vertical.

The economic mechanism is really that factor supplies do not depend on the level of aggregate demand (or prices). How many hours people want to work depends on real wages and on how much is paid to those who don't work. It does not depend on aggregate demand.

2. [11 points] Consider a central bank in a high inflation environment that wants to bring inflation down. Can you think of mechanisms or institutional arrangements that would dampen the recession associated with slowing the money growth rate? Explain how this might work. Hint: think expectations.

**Answer:** The key is to bring inflation expectations down. This is because the link between slower money growth and recession works through deviations between actual and expected inflation. Possible institutional arrangements (all of these have been tried in the real world):

- (a) Peg the currency credibly (e.g., via a currency board) against a currency with lower inflation.
- (b) Write the inflation target into law.

3. [9 points] How can inflation expectations be an instrument of monetary policy? If the Fed manages to convince the economy that inflation will be higher in the future, is the effect expansionary or contractionary?

**Answer:** What matters for consumption and investment demand is the real interest rate. If the Fed can convince people to expect higher inflation in the future, the real interest rate declines. This stimulates aggregate demand.

4. [9 points] Does the Fed control the nominal or the real interest rate?

**Answer:** In the short run: inflation expectations lag, so the Fed controls both. In the medium run: inflation expectations adjust. Faster money growth implies more inflation. Money becomes neutral. The Fed only controls the nominal rate.

## 2 Short Questions: Open Economy

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

1. [9 points] Does trade with low wage countries force U.S. companies to reduce wages in order to remain competitive?

**Answer:** No. The US will specialize in goods with high relative productivity. Wages will equal marginal products in those sectors. They are determined by technology, not trade. By construction, imported products must be cheaper than domestically produced products. So the price index declines and real wages must rise.

2. [13 points] Suppose you could open up trade with one of two countries. Country A is half as productive in making all goods compared with the U.S. Country B is half as productive in making one set of goods, but equally productive as the US in making all of the other goods. Which country would you want to be able to trade with?

How would your answer change if B's productivity doubled for all goods?

**Answer:** This is about comparative advantage. Opening up trade with A would not do anything. Relative prices in A are the same as relative prices in the US. There would be no trade. Opening up trade with B would be more beneficial (setting aside distributional concerns). B could export the good where it has a comparative advantage (the "other" goods).

Doubling B's productivity would not change the answer. The trade pattern would stay the same. US imports would likely get cheaper.

3. [11 points] Explain why fixed exchange rate regimes are vulnerable to speculative attacks, even if the economic fundamentals are sound. What would you expect to happen to the interest rate of a currency that investors think might be devalued?

**Answer:** The short answer: the peg insures the speculators against currency movements that go against them. If a currency comes under attack (or doubt), investors expect possible capital losses and the interest rate must rise to compensate.

4. [9 points] Explain in words why the central bank loses control over the money supply under fixed exchange rates.

**Answer:** If the peg is credible, it fixes the expected exchange rate. Investing in either currency involves no capital gains or losses. UIP then forces the interest rates in both countries to be the same. But if the Fed wanted to change the money supply, the interest would have to change. Capital flows would result, forcing the Fed to buy back any money it previously issued.

5. [9 points] Consider an environment with floating exchange rates and no capital mobility. How would a foreign recession affect the domestic economy? You don't need a model for this; just logic.

**Answer:** There is no effect. No capital flows means  $NX = 0$ . A foreign recession decreases export demand. But the FX market is not in equilibrium. The home currency must depreciate until net exports are zero again. Then there is no change in aggregate demand at home. Note that capital flows would invalidate this argument.

6. [8 points] With floating exchange rates and perfect capital mobility, what does a positive interest rate differential ( $i > i^*$ ) indicate about investor's expectations about the exchange rate? Explain.

**Answer:** UIP requires expected returns to be the same in two currencies. The total return is interest plus currency appreciation. If one interest rate is higher than the other, that currency must be expected to depreciate.

### 3 Government Transfers

As part of the Covid stimulus packages, the U.S. government currently pays transfers to households. Critics argue that these transfers reduce labor supply. Assuming this is true, what are the short and medium run effects of such transfers? Illustrate your answer using the AS-AD diagram below.

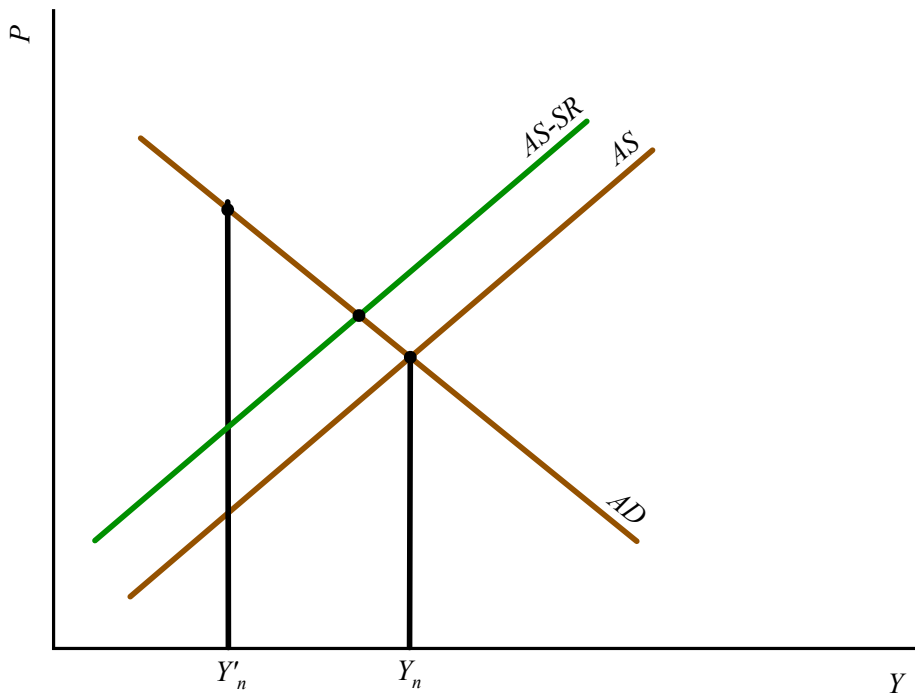
The appropriate model for this question is the closed economy AS/AD model with AS given by  $Y^s = F\left(\frac{P}{P^e} \frac{1}{1+m}, z\right)$  and AD combining IS ( $Y = C(Y - T) + I(Y, i) + G$ ) and LM ( $M/P = YL(i)$ ).

#### Questions:

1. [18 points] Graph the medium-run and short-run equilibrium. Explain which curves shift.

**Answer:** MR-AS shifts left as labor supply declines.

One could argue that AD shifts out. It probably does, but then the transfers need to be financed somehow. So it's unclear and not of primary importance.



2. [14 points] What happens to investment, consumption, and interest rates in the medium run?

**Answer:** MR equilibrium has higher prices and lower output. In the background: investment declines; so does consumption. The interest rate rises. If it did not, AD would exceed AS. Note that the change in  $i$  looks ambiguous if you just look at the IS/LM graph ( $M/P \downarrow$ , but also  $Y \downarrow$ ).

3. [9 points] What happens to investment, consumption, and interest rates in the short run?

**Answer:** The SR shift in AS is smaller than the MR shift (b/c price expectations lag behind prices). So we get a smaller contraction than in the MR and a small price increase.  $I$  and  $C$  again decline. The interest rate  $i$  rises.

4. [9 points] Explain what happens during the transition to the medium run equilibrium.

**Answer:** Prices are above  $P^e$ , so  $P^e$  starts to rise. That shifts AS up. Prices rise. The reduction in AD comes about either because  $M/P$  declines and therefore  $i$  rises. We get stagflation.

5. [8 points] If the president asked you whether the Fed could do anything to prevent output and employment from falling in this situation, what would you answer? Distinguish between the short run and the medium run.

**Answer:** The Fed could push AD out. In the short-run, this would prevent the output decline. But over time, price expectations will catch on and you just end up with inflation. Once medium run supply declines, demand management cannot do anything about it.

## 4 Floating Exchange Rates

Recall the equations for the open economy IS/LM model with floating exchange rates:

$$IS : Y = C(Y - T) + I(Y, i) + G + NX \left( Y, Y^*, \frac{1+i}{1+i^*} E^e \right) \quad (1)$$

$$LM : M/P = YL(i) \quad (2)$$

$$UIP : E = \frac{1+i}{1+i^*} E^e \quad (3)$$

### Questions:

1. [18 points] Consider the effect of an increase in the foreign interest rate. How does the change in  $i^*$  affect the domestic economy? Illustrate your answer in the graph and remember to explain your answer.

**Answer:** Higher  $i^*$  leads to dollar depreciation b/c investors must be compensated for the relatively low dollar interest rate with an expected appreciation.  $NX$  rise. This is a positive demand shock for the home country. IS shifts out.  $Y$  and  $i$  both rise.

2. [15 points] What would happen to investment, consumption, and the trade balance? Explain how your answer about the trade balance squares with  $NX = S - I$ .

**Answer:** Consumption rises due to higher  $Y$ . Investment is, in principle, ambiguous.  $NX$  rise (that's the shock). This is supported by higher private saving, unchanged government saving, while the change in investment is, as noted, ambiguous.

---

End of exam.