

Exam 1. Econ520. Fall 2025

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Instructions

- Answer all questions.
- **Write legibly.** I cannot grade what I cannot read.
- 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 **75 minutes**.
- The total number of points is **100**.

Name	PID

1. Short Questions

1. (23 points) Suppose the treasury tries to stimulate aggregate demand by **cutting consumption taxes** (i.e., sales taxes). How does the effectiveness of the tax cut depend on households' expectations about how **persistent** the tax cut will be?

Hint: Think income and substitution effects. But the answer is different from the income tax cut that we discussed in class.

Answer: Key idea: income versus substitution effects.

A **temporary** consumption tax cut lowers prices today relative to tomorrow. Households respond by substituting intertemporally. Consumption rises. The tax cut also increases households' real incomes. Side note: If you are familiar with Ricardian equivalence, you may doubt this statement. But we won't go there. The income effect is weak for a transitory tax cut (small increase in lifetime income).

For a **permanent** tax cut, it's the other way around. There are no substitution effects. The relative price of consumption today vs tomorrow is unchanged. But the income effects get larger. So the overall answer is ambiguous.

2. (22 points) In the data, rich people work about as many hours per year as poor people. Do you find this surprising? Explain.

Hint: The answer depends on whether the "rich" get their income from labor earnings or non-labor sources, such as dividends or interest.

Answer: Income effects should lead the rich to work less than the poor.

However, if the rich have high labor earnings, substitution effects would induce them to work hard. Then the answer is "no surprise."

If the rich get their high incomes from non-labor sources, the fact is surprising. There are no substitution effects.

A little subtle: The answer also depends on whether the high earnings that the rich may enjoy are transitory (small income effects) or permanent (large income effects).

3. (20 points) What is the main policy tool of **traditional monetary policy**? What does the Fed need to control in order to affect aggregate demand? How does the difference between the two interest rates make monetary policy difficult?

Answer: The Fed controls the federal funds rate, which is a nominal, overnight interest rate that only banks care about. Investment and consumption depend on real, longer-term interest rates, such as corporate bond and mortgage rates.

Difficulties:

- Varying the FFR may not affect the nominal bond rates. For example, banks may soak up any liquidity that the Fed injects.
- Lags: It takes a long time for a change in the FFR to affect long-term interest rates.
- The Fed controls nominal rates, but investment and consumption depend on real rates. Loose monetary policy, for example, may change inflation expectations. That affects real rates in a way the Fed does not control.

2. Expectations as a Policy Tool

Consider a slight variation of the standard IS/LM model:

$$\text{IS} : Y = C(Y - T) + I(Y, i, \underline{i^e}) + G$$

$$\text{LM} : \frac{M}{P} = Y \star L(i)$$

The new feature is the underlined expectations term in the IS curve $\underline{i^e}$. The idea is that investment projects last a long time. Therefore, investors care about future interest rates, i^e . In particular, low future interest rates stimulate investment today because capital costs are low.

Suppose that the Fed announces today that it plans to keep interest rates low in the future.

Questions:

1. (15 points) In an IS/LM diagram, show how this announcement would affect today's output and interest rate. Explain your answer.

Answer: In short, this is a standard positive demand shock that shifts IS to the right. Output and interest rates rise, as do investment and consumption.
A complete answer explains that IS shifts right because $I \uparrow$. It illustrates the new equilibrium in the graph, which shows that Y and i both rise.

2. (20 points) Explain in words why these changes come about. In particular:
 - Explain what happens to investment and consumption.
 - Explain what role the money market plays in dampening the effects of the shock.
 - Explain the sequence of events that lead to the new equilibrium.

Answer: The answer is essentially the same as that for any other positive demand shock. Consumption rises because $Y \uparrow$. Investment rises due to the shock and because $Y \uparrow$, but it is dampened by higher i .

Sequence of events (as for any demand shock):

- Higher I raises Y .
- C rises, creating the usual multiplier effect.
- The economy moves horizontally to the right (new IS curve; same i).
- Money demand rises. People try to sell bonds, driving up i . That crowds out I .
- We move north-west along the IS curve to the new equilibrium. That movement reduces money demand and continues until the money market clears again. It also reduces I as interest rates rise. That's how the money market dampens the shock.

End of exam