

Exam 1. Econ520. Fall 2022

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UNC

Instructions:

- Answer all questions.
- Write legibly.
- If you need more space, attach additional pages. Number your answers. Do not write on the back of the pages.
- *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 75.

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1 Short Questions [28 points]

1. [7 points] How does labor supply respond to higher wages? Explain your answer in terms of income and substitution effects. Distinguish between transitory and permanent wage increases.

Answer _____

Higher wages make work more attractive (leisure more expensive). That's the substitution effect. Hours increase.

Higher wages also increase permanent income. Workers demand more leisure. Hours fall. That's the income effect.

The net response depends on whether income or substitution effects are stronger. For transitory wage changes, income effects are small. For permanent ones, income effects are large and labor supply rises by less or even falls as wages rise.

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2. [7 points] Suppose the Fed increased the money growth rate permanently from 2% p.a. to 5% p.a. What would you expect to happen to the U.S. economy after five years? Explain.

Answer _____

The key idea here is monetary neutrality or the Classical Dichotomy. Once price frictions have worked their way through the system, real variables become independent of money growth. The only changes are: higher inflation and a higher nominal (but not real) interest rate.

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3. [7 points] Economists routinely say that we are above full employment, even though the unemployment rate is positive. How is this possible? What does "full employment" mean?

Answer _____

Full employment means the level of employment attained when all the pricing frictions have resolved. Its level is determined by the real wage, incentives for non work (e.g., unemployment benefits), and worker preferences (that shift the labor supply curve).

At full employment, not everyone works. If unemployment were measured perfectly, only frictional unemployment would remain (people are between jobs). In reality, people file for unemployment even though they don't want to work and vice versa. So measured unemployment will be positive.

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4. [7 points] Explain why the aggregate demand curve is downward sloping in the price level.

Answer _____

Recall the AD comes from the intersection of IS and LM. Higher prices reduce M/P , shifting the LM curve left. The interest rate rises, which reduces demand. The economic intuition: People need more liquidity when prices are high. They sell bonds, which drives up interest rates and crowds out demand.

2 Phillips Curve [14 points]

1. The aggregate supply curve implies a Phillips curve of the form $\pi = \pi^e + (m + z) - \alpha u$.
 - (a) [7 points] Explain how the Phillips curve leads to the idea of a NAIRU. What does NAIRU mean? What key assumption (about expectations) is necessary for a NAIRU to exist?

Answer _____

NAIRU = non accelerating inflation rate of unemployment. The level of unemployment that is consistent with constant inflation.

To get a NAIRU, we need $\pi_t^e = \pi_{t-1}$. Then the Phillips curve becomes $\pi_t - \pi_{t-1} = m + z - \alpha u$. It implies a relationship between unemployment and the rate of inflation change. There is one unemployment rate (NAIRU) for which inflation is constant.

- (b) [7 points] Suppose a stable NAIRU exists. What does this imply for the policy trade-off between inflation and unemployment?

Answer _____

Stable NAIRU really means stable inflation expectation. NAIRU implies that one can buy lower unemployment with rising inflation. Of course, inflation cannot keep rising forever. Effectively, the government can buy a period of lower unemployment by accepting permanently higher inflation.

3 AS/AD: Fiscal expansion [33 points]

Consider the AS/AD model, which consists of

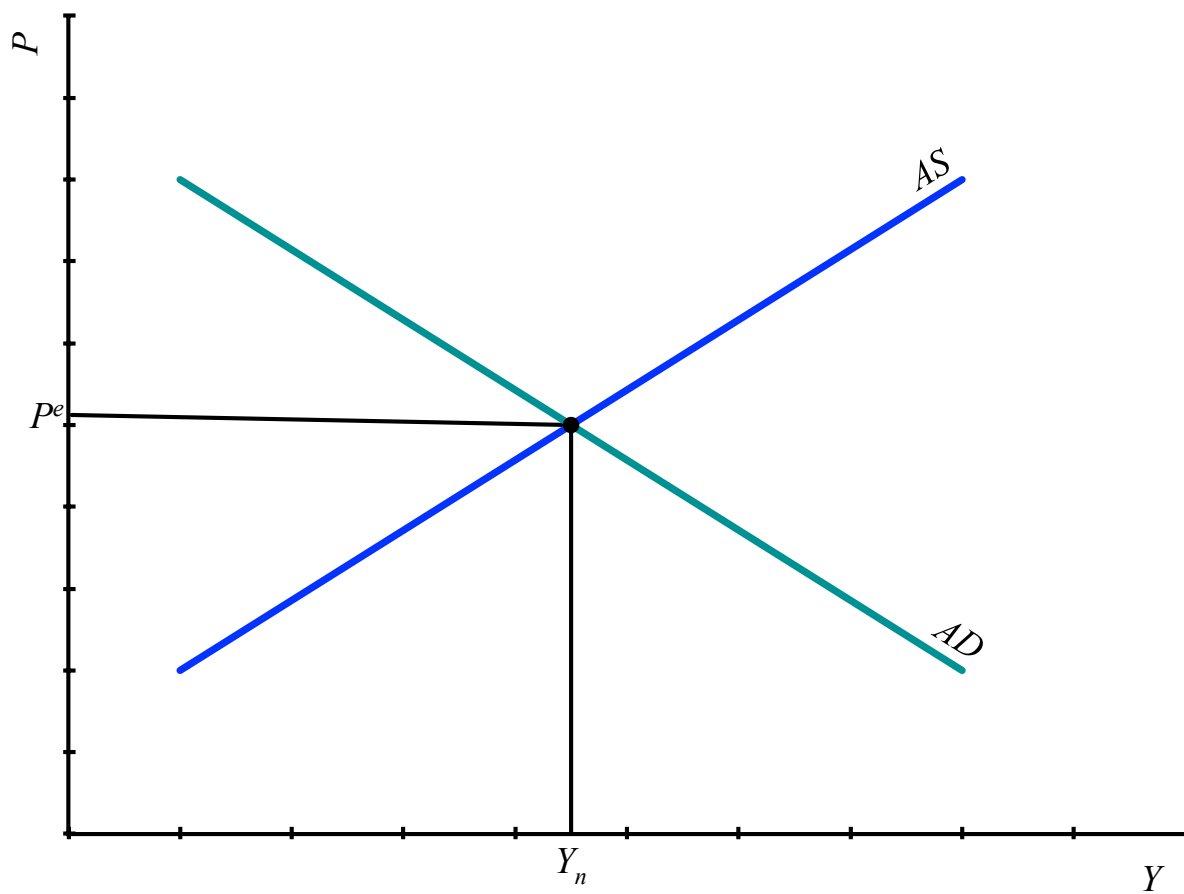
- AS: $Y = F\left(\frac{P}{P^e} \frac{1}{1+m}, z\right)$
- IS: $Y = C(Y - T) + G + I(Y, i)$
- LM: $M/P = YL(i)$

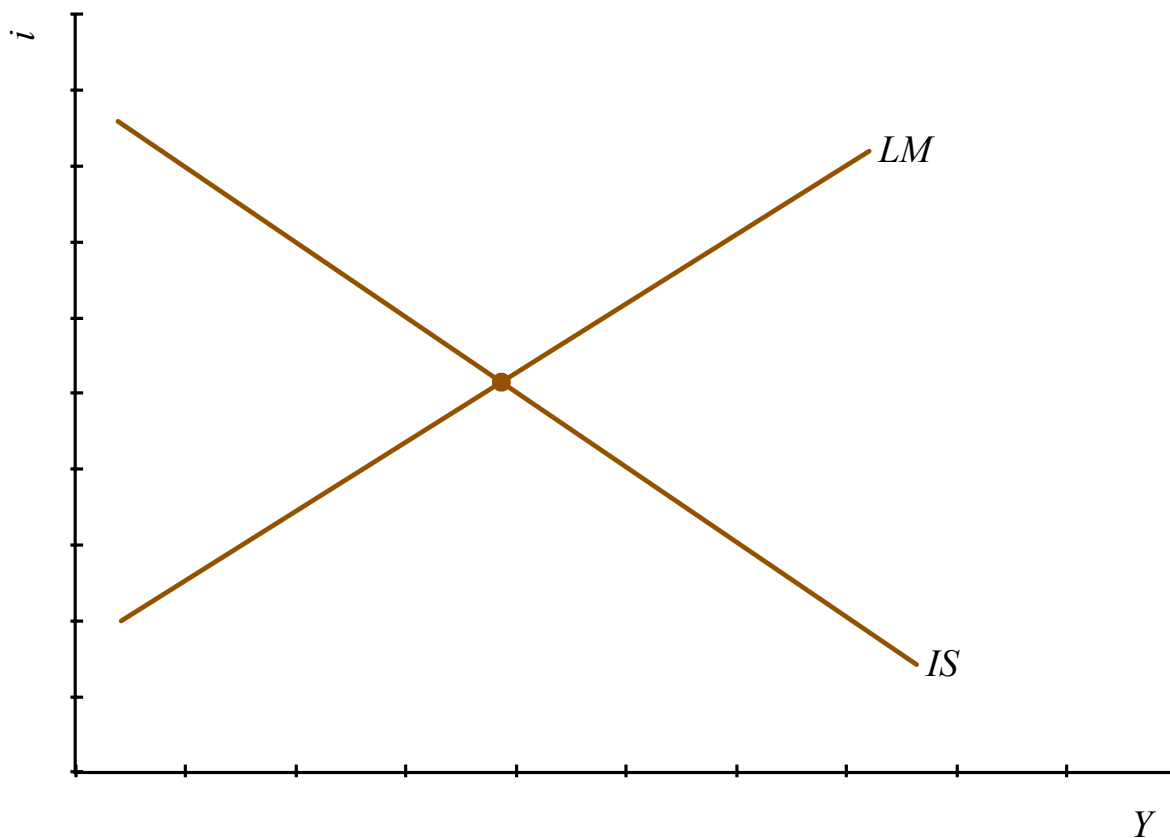
We examine the idea that government spending programs (e.g., infrastructure building programs) create jobs. To be specific, consider a permanent increase in government spending ($G \uparrow$).

Use the AS/AD graph and the IS/LM graph to illustrate your answers.

Questions:

1. [14 points] Explain what would happen in the **medium run** to output, investment, consumption, and prices. To what extent does government spending crowd out private spending? What is the economic mechanism underlying the crowding out?
2. [14 points] Explain what would happen in the **short run** to the same variables. How are workers incentivized to work more than “full employment” ($Y > Y_n$)?
3. [5 points] Explain the **transition** between short run and medium run.





Answer _____

1. Medium run:

- Equilibrium is MR-AS and AD. AD shifted out. Hence output unchanged and higher prices. No jobs are created. They are just shifted around.
- In the background: IS shifts out. Higher prices shift LM left. Interest rate rises. This is the mechanism that causes (full) crowding out.

2. Short run:

- Equilibrium is AS and AD. Hence higher output and prices. Jobs are created.
- In the background: IS shifts out. LM shifts left (less than in MR). Interest rates rise. Partial crowding out.
- Workers are incentivized to work “too much” because $W/P^e > W/P = 1/(1+m)$. They think the real wage is high.

3. Transition: standard story.

End of exam.