Multiple-choice questions (2 points each)

1) Consider $I = b_0 + b_1 Y - b_2 i$. The effect of an increase in government spending on investment is

    A) ambiguous both in the short run and in the medium run.

    B) ambiguous in the short run and negative in the medium run.

    C) negative both in the short run and the medium run.

    D) positive in the short run and negative in the medium run.

2) Which of the following is consistent with an increase in the inflation rate?

    A) A decrease in the mark-up coefficient.

    B) An increase in expected inflation rate.

    C) A decrease in unemployment benefits.

    D) All of the above

3) A once and for all increase in the nominal money growth **rate** is expected to

    A) increase the unemployment rate in the short run but not in the medium run.

    B) decrease the unemployment rate in the short run but not in the medium run.

    C) increase the inflation rate in the short run but not in the medium run.

    D) decrease the unemployment rate both in the short run and in the medium run.

4) An increase in unemployment benefits is expected to

    A) increase the unemployment rate in the short run but not in the medium run.

    B) increase the inflation rate in the short run but not in the medium run.

    C) increase the inflation rate both in the short run and in the medium run.

    D) decrease the unemployment rate in the short run but not in the medium run.

5) Suppose prices and wages are perfectly flexible (i.e., any changes in worker expectations are immediately incorporated into the wage and price setting mechanisms). Then

   A) the AS curve is vertical.

   B) monetary policy is neutral in the short run.

   C) fiscal policy has no short-run output impact.

   D) all of the above

6) The NAIRU is the rate of unemployment at which

   A) inflation is necessarily constant over time.

   B) prices are necessarily constant over time.

   C) the rate of change of inflation is necessarily constant over time.

   D) all of the above.

7) Consider the levels AS-AD framework (Ch. 7). If investment is more responsive to changes in the interest rate, then the short run impact of expansionary monetary policy is

   A) greater for prices and output.

   B) greater for prices but lower for output.

   C) greater for output but lower for prices.

   D) lower for prices and output.

8) Globalization could encourage a reduction in the natural rate of unemployment for all of the following reasons except:

   A) creating stricter world-wide labor regulations to protect worker rights.

   B) decreasing worker bargaining power through the threat of outsourcing production.

   C) decreasing the mark-up firms can charge over costs.

   D) promoting higher product market competition between domestic and foreign firms.

9) In terms of the Phillips Curve, wage indexation results in

    A) a weaker/flatter relationship between unemployment and changes in inflation.

    B) no effect on the relationship between unemployment and changes in inflation.

    C) a stronger/steeper relationship between unemployment and changes in inflation.

    D) an ambiguous effect that depends on the mark-up of firms.

10) Output declines in both the short-run and medium-run for which of the following government actions:

    A) a deficit expansion.

    B) a deficit reduction.

    C) imposition of more stringent anti-trust laws.

    D) **relaxation of anti-trust laws**.

11) Which of the following does not affect the medium-run output level?

    A) Legislation relating to unemployment insurance.

    B) Price expectations in the economy.

    C) The sensitivity of efficiency wage premiums to unemployment levels.

    D) International competition in the goods market.

12) Suppose that Macronesia starts at the natural level of output. Then the Macronesian central bank increases the nominal money supply. In the medium run (when output has returned to the natural level), the real money supply is

    A) smaller than it was initially.

    B) the same as it was initially.

    C) larger than it was initially.

    D) indeterminate based on the information given.

13) If the markup changes, the natural level of output

   A) changes immediately.

   B) changes only when prices have adjusted to be equal to expected prices.

   C) changes only if fiscal policy also changes.

   D) does not change.

14) Suppose again that Macronesia starts at the natural level of output. After an increase in the markup, in the medium run, interest rates will

   A) decrease

   B) stay the same.

   C) increase.

   D) indeterminate based on the information given.

15) Deviations in output from normal levels have

   A) a smaller effect on employment in the US than in Japan because the US labor force is less skilled than the Japanese labor force.

   B) a smaller effect on employment in the US than in Japan because jobs traditionally last longer in the US.

   C) a bigger effect on employment in the US than in Japan because the Japanese labor force is older than the US labor force.

   D) a bigger effect on employment in the US than in Japan because there are fewer restrictions on firms' adjustment of employment in the US.

Long Question 1 (40 points):

Consider an economy characterized by the following relationships:

Goods Market: $Y=C(Y-T)+I(Y,i)+G$ Financial Markets: $M/P=Y*L(i)$

Wage Setting: $W=P^e*F(u,z)$ Price Setting: $P=(1+m)*W$

Production Technology: $Y=N$ Constant Size of Labor Force: L

All variables and functions are defined as they were in lectures and the textbook.

Develop an Aggregate Supply (AS) relationship that relates the price level in the economy to the expected price level, the level of firm competition (m), labor market conditions (z), and the output level in the economy. Solve for the output level as a function of unemployment and express your AS equation in terms of Y (and not u). In no more than three sentences, explain why the AS curve captures the notion that "high economic activity puts upwards pressure on prices". In particular, describe the channels through which an increase in output leads to an increase in the price level. **(10 points)**

Using the Wage Setting, Price Setting, and Production Technology relationships, along with the size of the labor force, the AS curve can be derived as

$P=P^e*(1+m)*F(1-Y/L,z)$.

An increase in output requires a higher employment level, or a reduction in the unemployment rate. The lower unemployment rate puts upward pressure on wages (in both the Wage Bargaining and Efficiency Wage models). This higher cost level for firms (for a given mark-up) leads to a higher prices.

Below you are given three policy changes. For each, you are to describe the short-run and medium-run dynamics of the economy. To get full credit, you must provide:

- In the top-left graph, a clear accounting of the shifting AS and/or AD curves. Use the bottom-left graph to show how the underlying IS and LM curves are moving.

- In each graph, the drawn curves represent the initial equilibrium. Label short-run movements these equilibriums with a "1", and medium-run movements with a "2". Include the following axis or curve labels (Y^n is the natural rate of output):

    - Initial Equilibrium: AS_0, AD_0, IS_0, LM_0, P_0, P^e_0, Y_0, Y^n_0, i_0

    - Short-Run Equilibrium: AS_1, AD_1, IS_1, LM_1, P_1, P^e_1, Y_1, Y^n_1, i_1

    - Medium-Run Equilibrium: AS_2, AD_2, IS_2, LM_2, P_2, P^e_2, Y_2, Y^n_2, i_2

- If appropriate, use the IS-LM graph to show how this model's short-run response is different from the fixed-price model studied in the first section of this course.

- In the right graph, a time-path analysis of output, real money balances, prices, and interest rates (as in Problem Set 3). T_0 is the time of the policy change, and T_2 when the new medium-run equilibrium is reached.

- A one-sentence discussion of whether investment in the economy has increased or decreased following the policy change (and why). You do **NOT** need to describe the dynamics of investment, just whether investment is higher or lower (and why) in the new medium-run equilibrium vis-à-vis the initial equilibrium.

The government cuts defense spending. (10 points)

AS-AD

P

Y

Time-Path

Y

M/P

P

i

T_0 T_2 Time

IS-LM

i

Y
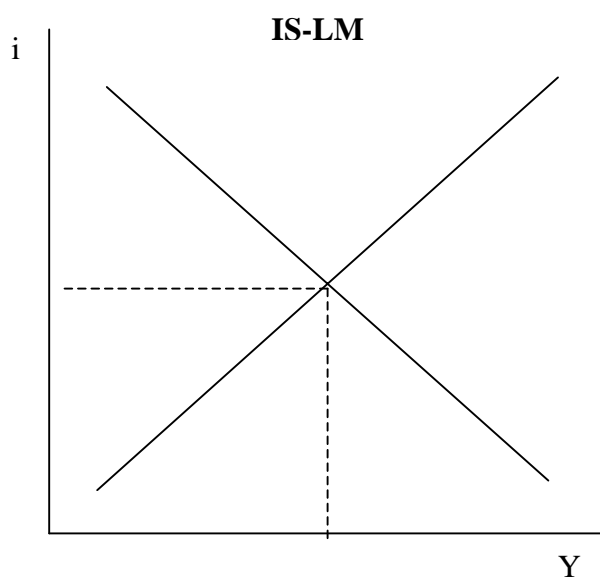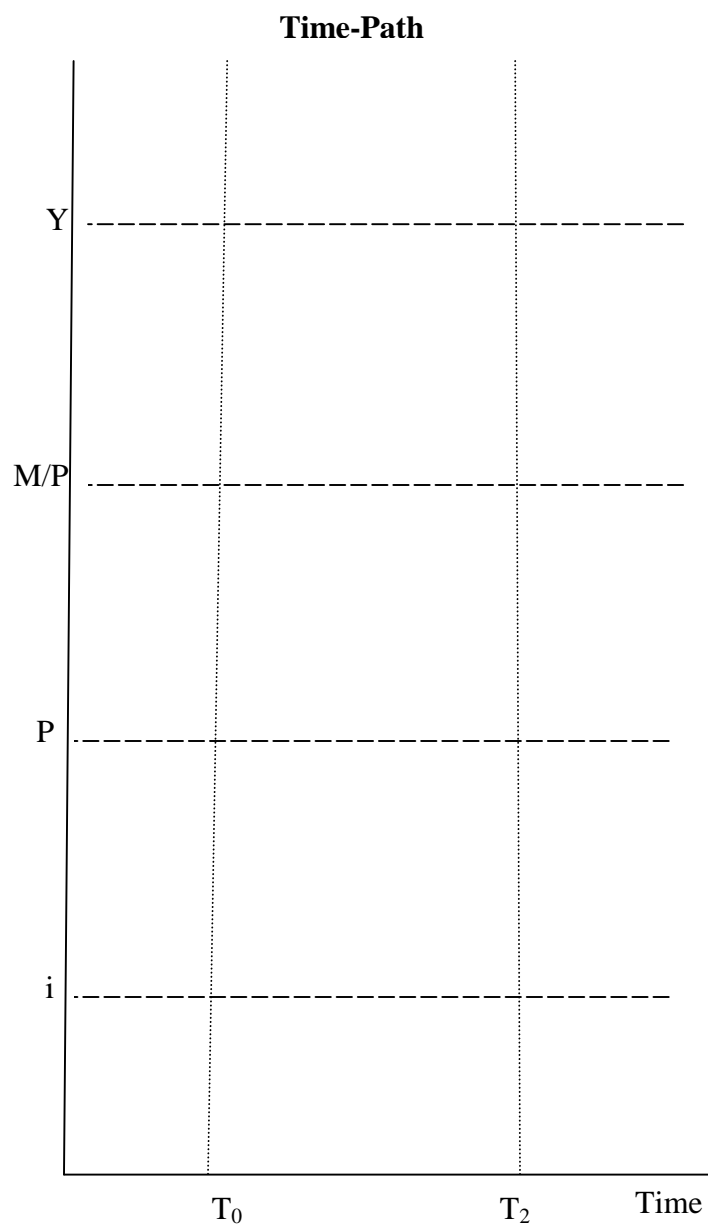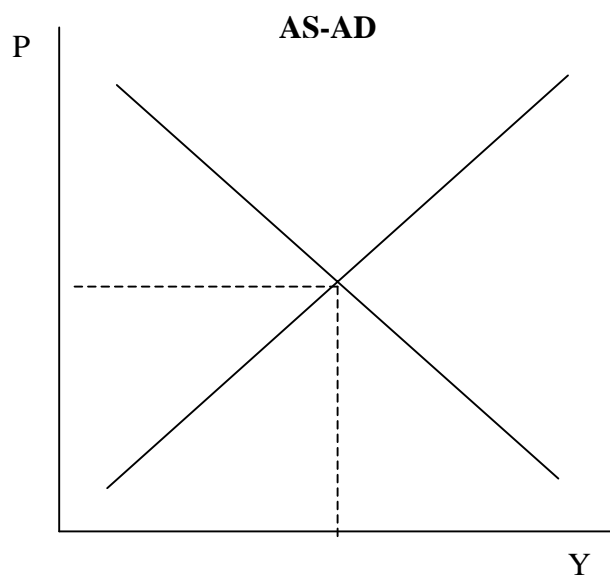
How does the new medium-run investment level compare to the initial level?

The government decreases the money supply. (10 points)

AS-AD

Time-Path

IS-LM
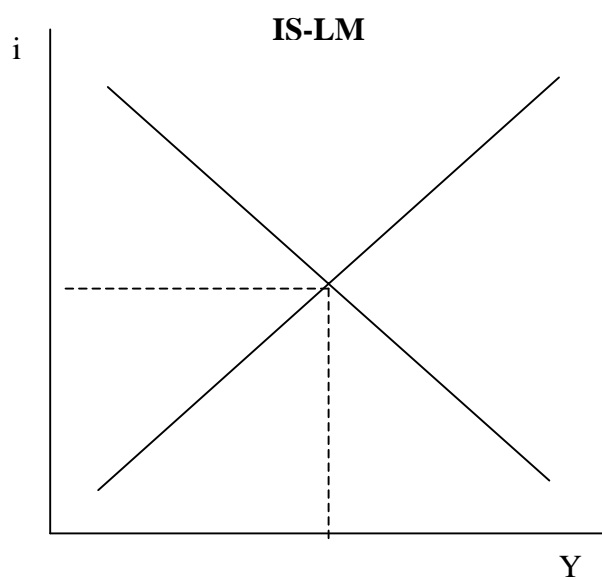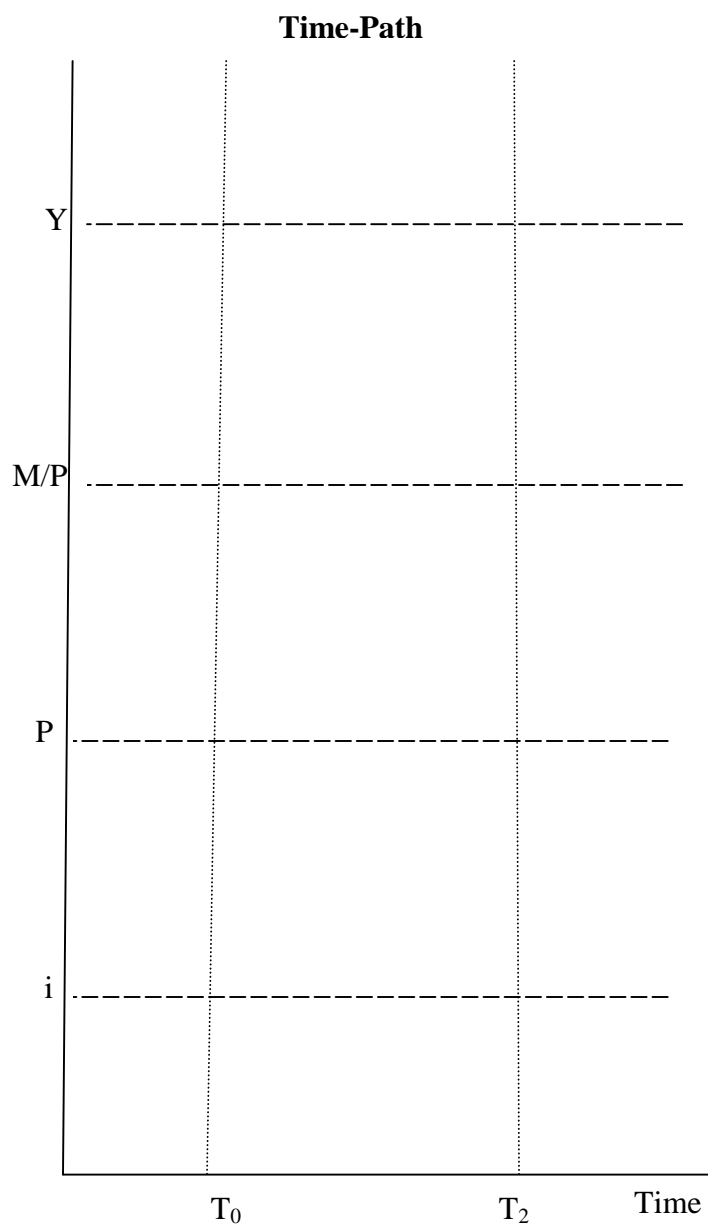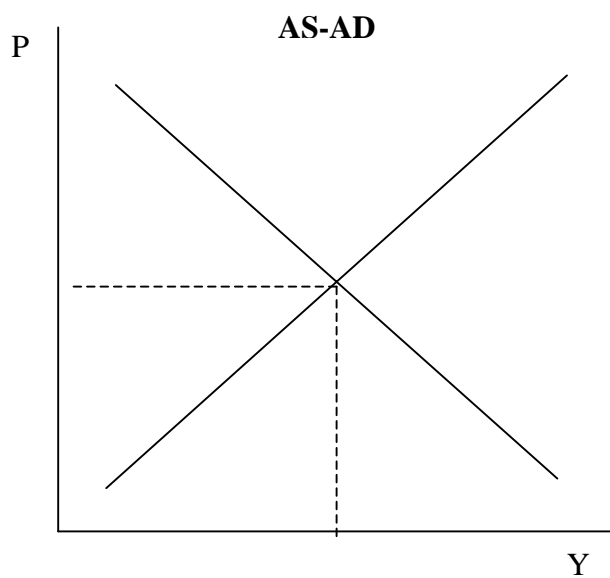
How does the new medium-run investment level compare to the initial level?

The government strengthens anti-trust legislation (firms must decrease their mark-up over costs). (10 points)

AS-AD

P

Y

IS-LM

i

Y

Time-Path

Y

M/P

P

i

T$_0$ T$_2$ Time
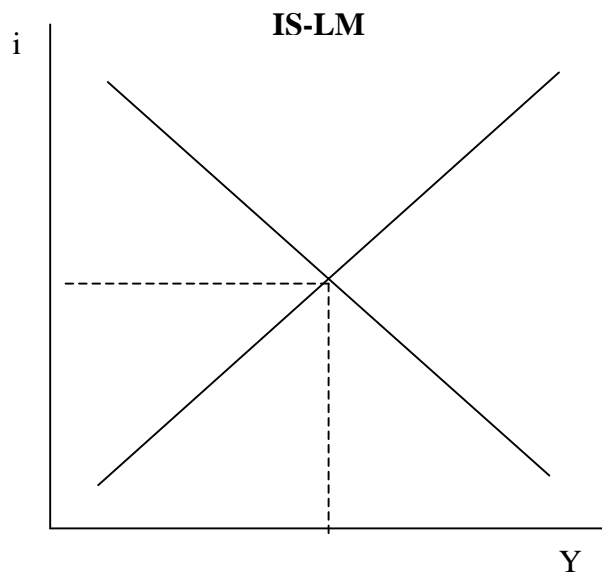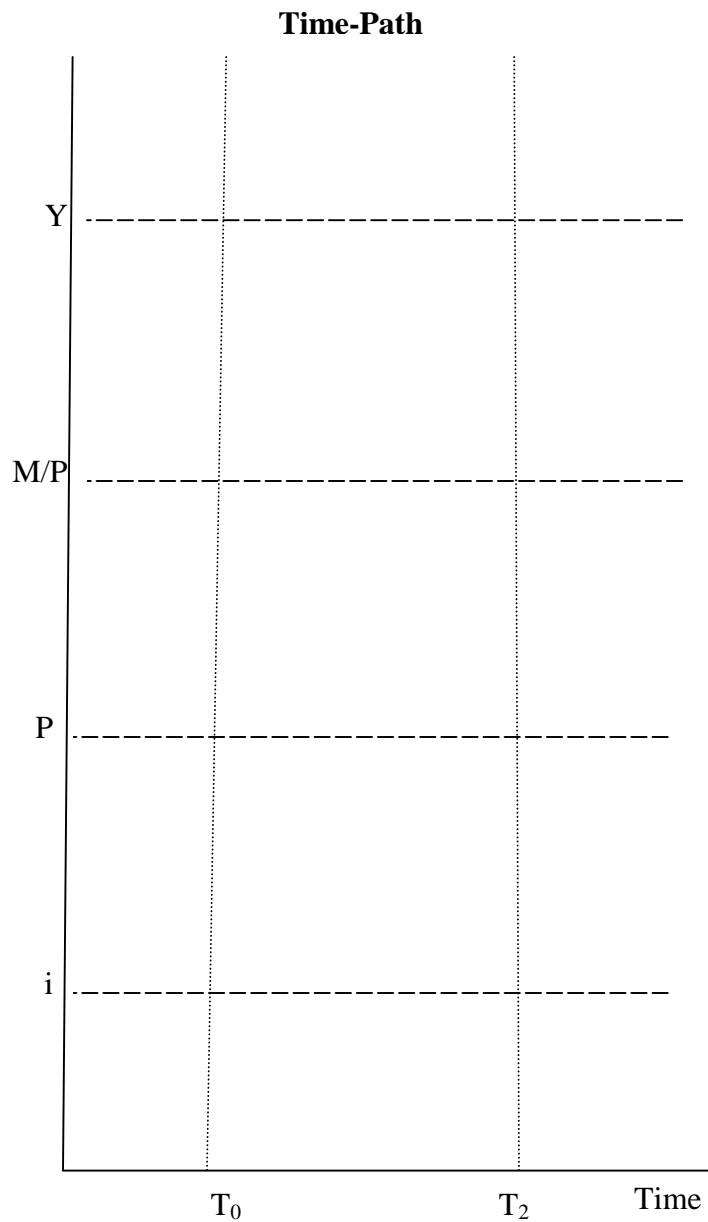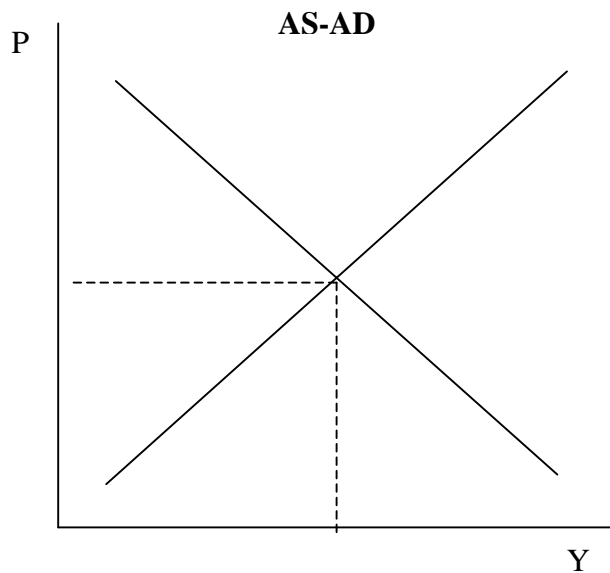
How does the new medium-run investment level compare to the initial level?

Long question 2:

You are the central banker of Macronesia, a country suffering from high inflation. It is your job to get inflation down from 20% to 6% in one year. Output growth is at its normal rate of 4% and unemployment is at its natural rate of 8%. Money growth and inflation are both stable.

Fortunately, you have some simple macroeconomic equations that hold in Macronesia. You know that:

1) $u_t - u_{t-1} = -0.5(g_{yt} - \bar{g}_y)$ ($\bar{g}_y = 4\%$)

2) $\pi_t - \pi_t^e = -2(u_t - u_n)$

3) $g_{yt} = g_{mt} - \pi_t$

With these simple relations, it is your job to solve the problem of Macronesian inflation. For parts A), B), and C), assume that $\pi_t^e = \pi_{t-1}$.

A) Start by finding what money growth must have been initially in Macronesia. (3 points)

$\bar{g}_m = \bar{g}_y + \pi_0 = 4\% + 20\% = 24\%$. (Subscript zero stands for year 0)

B) What will money growth have to eventually become for inflation to be stable at 6%? (3 points)

$\bar{g}_m = \bar{g}_y + \pi_0 = 4\% + 6\% = 10\%$. (Subscript four stands for year 4 – after disinflation)

C) You have to decrease inflation by 14 percentage points between year 0 and year 1. Use your trusty equations to find the path of the macroeconomic variables in Macronesia. Fill in the table and show your work.

You can use your answer from part A) to fill in nominal money growth in year 0 and your answer from part B) to fill in nominal money growth in year 3. (10 points)

	Before	**Disinflation**	**After**	
	Year 0	Year 1	Year 2	Year 3
Inflation (%)	20	6	6	6
Unemployment (%)	8	**15**	8	8
Output growth (%)	4	**-10**	18	4
Nominal money growth (%)	24	**-4**	24	10

D) In the environment specified in A)-C) how would pursuing a more gradual disinflation (one that took longer than a year) affect the sacrifice ratio? (4 points)

There would be no effect. The sacrifice ratio is independent of the speed of disinflation in the model of A)-C).

E) Let's assume you're still the central banker many years later when inflation has again become uncomfortably high. You announce that you again plan to undertake a disinflationary policy. Remembering how well you handled the first disinflation, the people of Macronesia believe that you will carry out your plans. Will these expectations of decreasing inflation make it more or less costly for you to actually cut inflation (compared to the first disinflation)? In one or two sentences, use equation (2) to explain your answer. (5 points)

This will make it easier to cut inflation. This is because π_t^e adjusts more quickly than adaptive expectations ($\pi_t^e = \pi_{t-1}$). In fact, if π_t^e adjusted all the way to 6%, we could theoretically have the disinflation we want with no cost of higher unemployment.

F) Assume now that some fraction λ of wage contracts are indexed to inflation (they automatically adjust to changes in inflation). Equation (2) then becomes

$\pi_t - \pi_t^e = \dfrac{-2}{1-\lambda}(u_t - u_n)$. When more wage contracts are indexed (higher λ), will the economy have to suffer a higher cost to bring inflation down? Explain in one or two sentences. (5 points)

The economy will have to suffer a lower cost to bring inflation down. The disinflationary effects of high unemployment can get built into wages immediately when wages are indexed, rather than having to wait until the next contract negotiation.