1. **IS/MP/IA in the Open Economy**
    a) MP shifts downward & AD shifts right. $Y\uparrow$, $r\downarrow$, $\pi\uparrow$, $C\uparrow$, $I\uparrow$, $CF\uparrow$, $ depreciates.
    b) If the Fed lowered interest rates by the same amount in a closed economy, then the effect on output would be smaller. In the open economy, when the Fed lowers interest rates, this boost BOTH investment (I) AND net exports (CF). In the closed economy, the decrease in interest rates affects only investment. In the open economy, we have an additional channel through which monetary policy affects spending.
    c) IS shifts leftward & AD shifts leftward. The corresponding decrease inflation causes the MP curve to shift down. $Y\downarrow$, $r\downarrow$, $\pi\downarrow$, $C\downarrow$, $I\uparrow$, $CF\uparrow$, $ depreciates.
    d) Notice that in the closed economy, the tax increase reduces interest rates which boost investment – partially offsetting the negative effects on output (Y). Here, in the open economy, the decrease in interest rates boosts BOTH investment and net exports, further offsetting the effects on output.
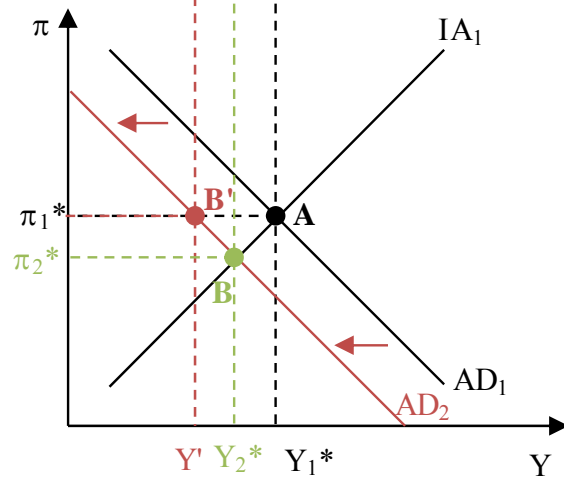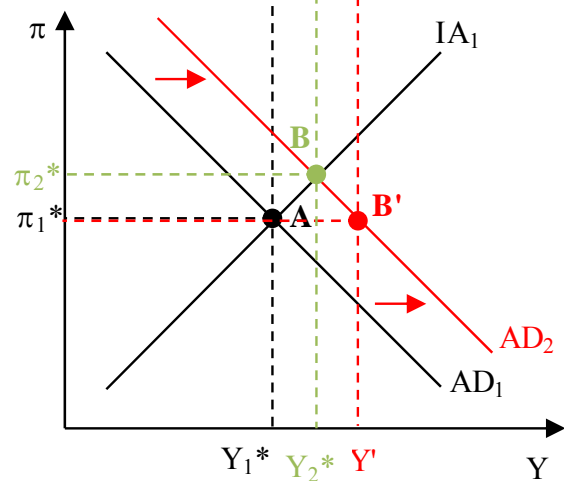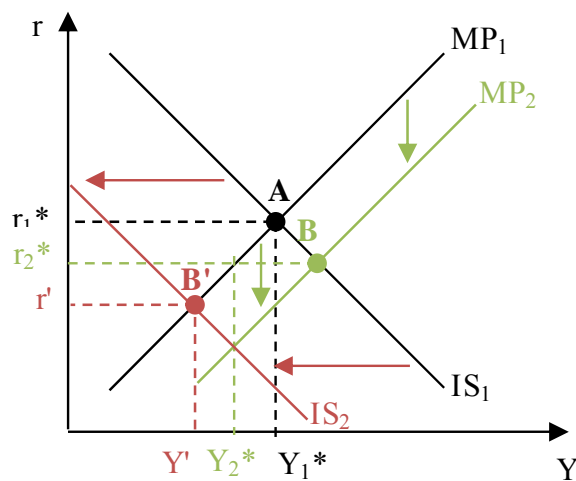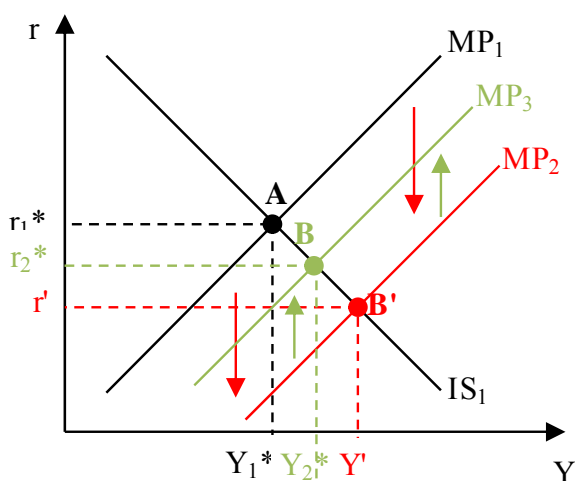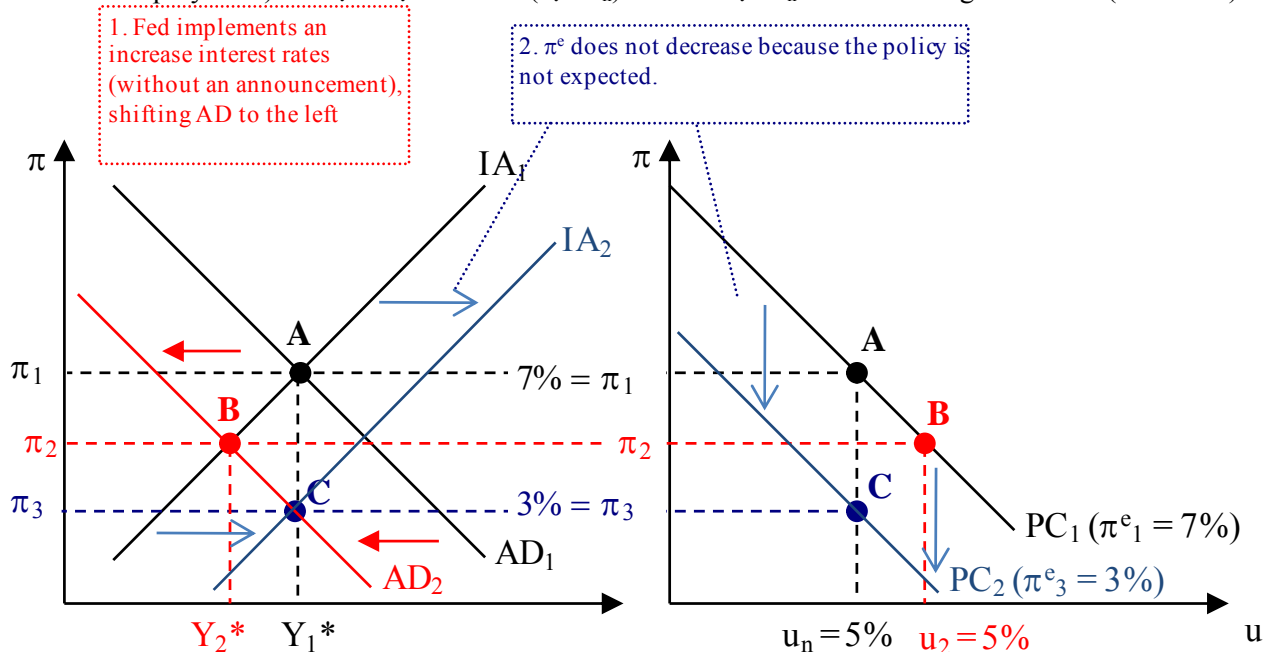

1a)

1c)

2. **Phillips Curve**
    a) In the long run, expected inflation must equal actual inflation (otherwise, producers would adjust their prices to reflect the difference). Recall, this is the mechanism through which the economy moves from short run to long run in the IS/MP/IA model. We can see from the Phillips curve above, that this

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implies the current level of unemployment is equal to the natural rate (e.g., the rate that corresponds to full employment). If $\pi_t = \pi^e_t$ then $- 0.5(u_t - u_n) = 0$ and $u_t = u_n = 5\%$. See diagram below (to the left)

1. Fed implements an increase interest rates (without an announcement), shifting AD to the left

2. π^e does not decrease because the policy is not expected.

b) See diagram above to the right. The long run equilibrium is defined as the level of output where $Y = Y^P$.
c) Since the policy change is unexpected, the Fed will implement an increase in interest rates that is not expected, therefore expected inflation remains unchanged. Therefore, aggregate demand shifts to the left, output declines, inflation falls, and the unemployment rate increases. This is illustrated as a movement along the Phillips Curve because expected inflation is unchanged.
d) At point B, output is below full employment. Eventually, expected inflation will decrease, shifting the IA line to the right, until the gap between actual and full employment output is closed. Notice, this decrease in expected inflation is illustrated as a downward shift in the Phillips curve (the intercept decreases), until the economy returns to the natural rate of unemployment.
e) It implies that the speed of adjustment will be rapid. In other words, if expected inflation changes in the short run, the economy moves directly from point A to point C.

3. **Theories of Business Cycles**
   For answers, review the reading. You should be able to identify the answers based on the article.

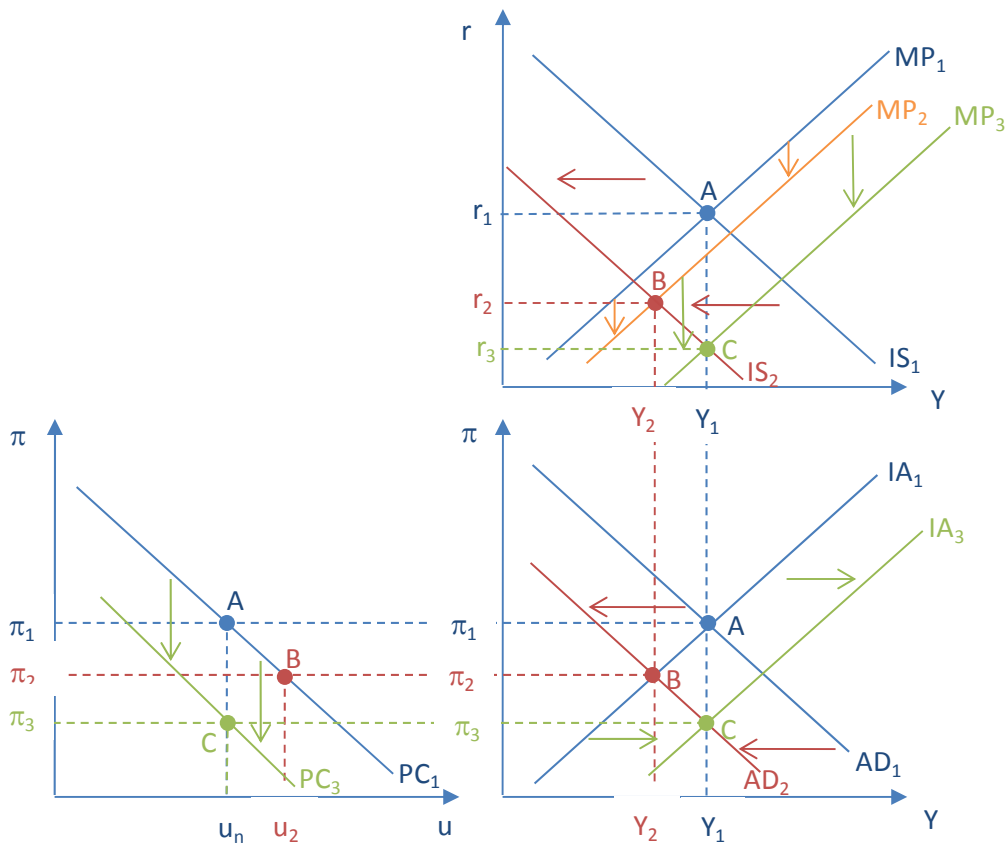4. **Comprehensive Macroeconomic Model**

   a) The Federal Reserve decreases the money supply.
   SR (A-B): $Y\downarrow$, $r\uparrow$, $\pi\downarrow$, $C\downarrow$, $I\downarrow$, $CF\downarrow$, $ appreciates.
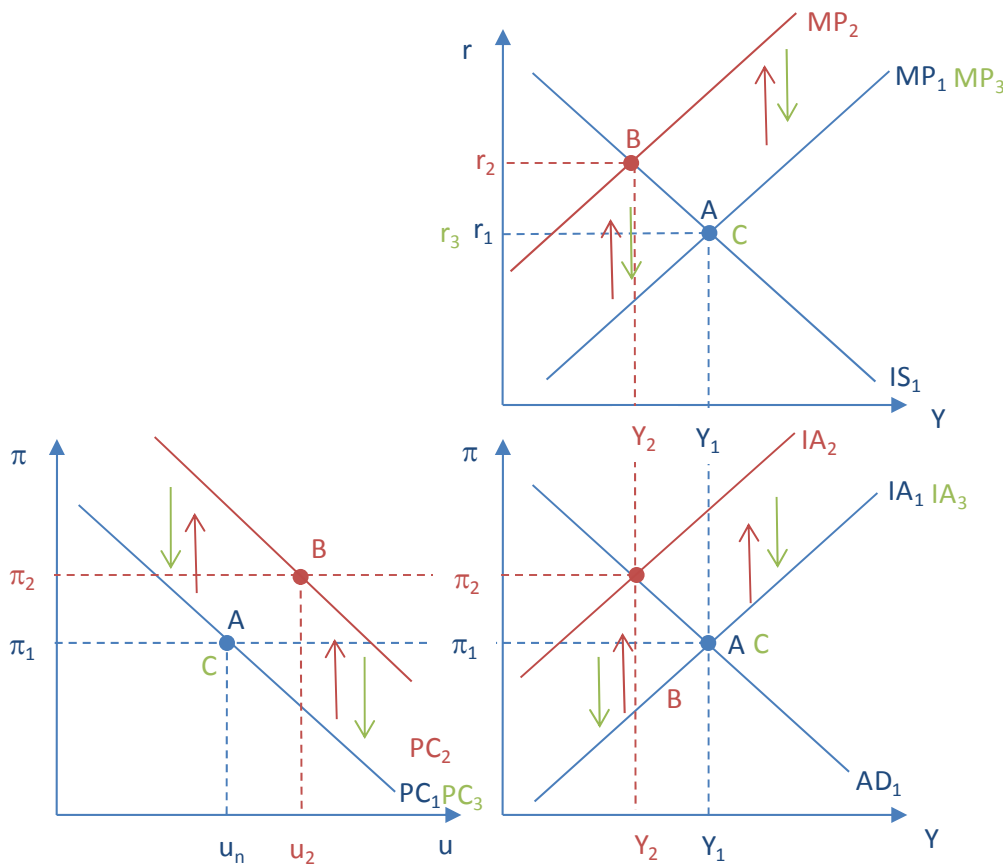   LR(A-C): No change, except $\pi\downarrow$.
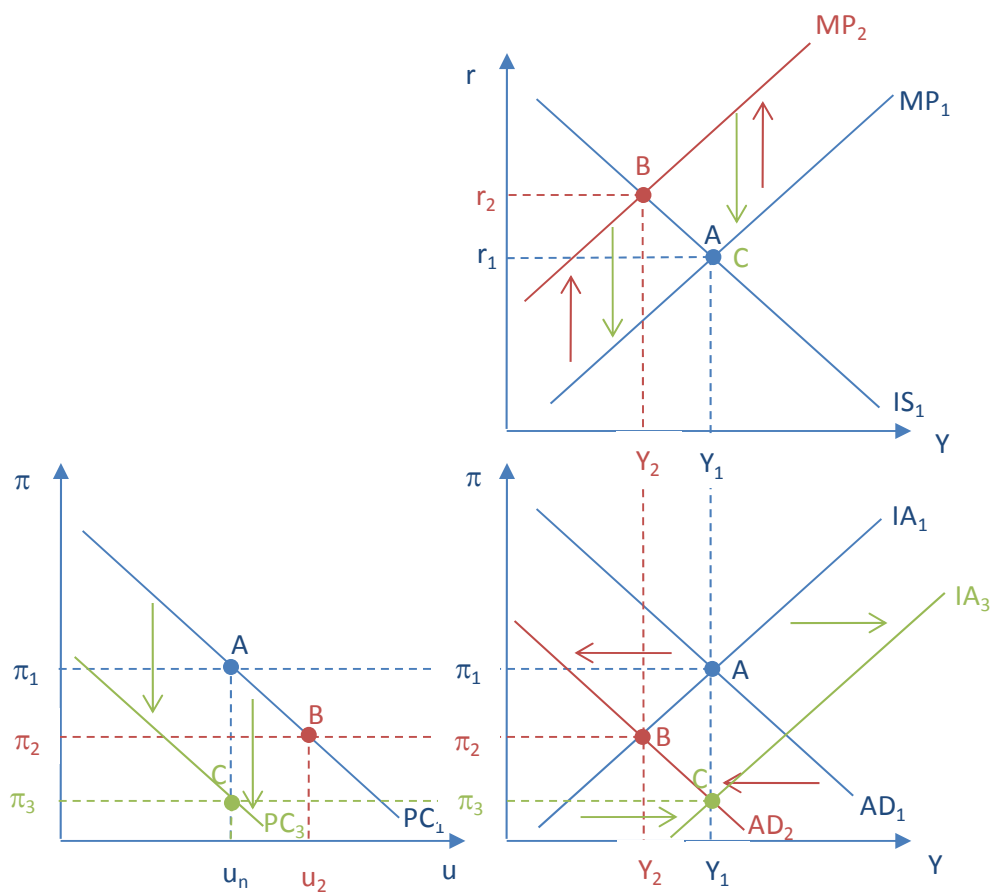
b) Consumer confidence decreases.

SR (A-B): $Y\downarrow$, $r\downarrow$, $\pi\downarrow$, $C\downarrow$, $I\uparrow$, $CF\uparrow$, $ depreciates.

LR(A-C): No change in Y, $C\downarrow$ (drop in consumer confidence), $r\downarrow$, $\pi\downarrow$, $I\uparrow$, $CF\uparrow$, $ depreciates.

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c) The government decreases taxes.
   Reverse of part b).

d) Oil prices increase.
   SR (A-B): $Y\downarrow$, $r\uparrow$, $\pi\uparrow$, $C\downarrow$, $I\downarrow$, $CF\downarrow$, $ appreciates.
   LR(A-C): No change in any variables.

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e) In general, rational expectations would mean the adjustment from Point B to Point C would be more rapid. The adjustment from short run to long run operates through the adjustment of inflation expectations. If people are rational, they revise their expectations quickly, shifting the IA and PC lines more quickly.

5. **Sources of Business Cycles**
   Consider data on the following recessions. Based on the data, identify one potential source of the recession (in terms of the exogenous shocks from the IS/MP/IA model). Use IS/MP/IA analysis to support your answer. During all of these recessions, output declines.
   a) 2001: Interest rates decrease and inflation declines. IS curve shifts to the left, causing AD to shift to the left.
   b) 1981-82: Interest rates increase and inflation decreases. MP shifts up, causing AD to shift to the left.
   c) 1974-75: Interest rates rise and inflation increases. IA shifts up (corresponding to an upward shift in MP).