

Worksheet on the LM curve

1. Deriving the LM curve
 - a. Draw two sets of axes side by side. On the left, the money market diagram, which measures the interest rate i on the vertical axis and real money balances M/P on the horizontal. On the set of axes on the right, measure the interest rate i on the vertical axis (using the same scale as in the money market diagram), and real income Y on the horizontal scale.
 - b. In the money market diagram, draw a vertical curve that represents the supply of real money balances, M/P .
 - c. Write down the real money demand function. Explain why it has a negative slope when i is measured on the vertical axis. Explain how an increase in Y would shift the money demand curve.
 - d. The position of the money demand curve, and hence the equilibrium interest rate, depends on whether income is high or low. Suppose income is currently low. Indicate Y_{LO} on the horizontal axis of the axes on the right side. In the money market diagram, draw the money demand curve that corresponds with Y_{LO} . The intersection of this money demand curve with your money supply curve determines the interest rate, which you should find on both vertical axes and label i_1 .
 - e. On the axes on the right side, find the point with coordinates (Y_{LO}, i_1) and label it "A."
 - f. Instead, suppose income were equal to Y_{HI} . Note that $Y_{HI} > Y_{LO}$. Draw the money demand curve corresponding to this higher value of income, find the interest rate that clears the money market and label it i_2 on both vertical axes, then find the point on the axes to the right with the coordinates (Y_{HI}, i_2) and label it "B."
 - g. Draw a line through points A and B. Congratulations, you have just derived the LM curve. Now, tell me whether the LM curve's slope is positive, negative, horizontal, or vertical, and briefly explain the intuition for its slope.
2. Points off the LM curve.

The LM curve shows all combinations of Y and i that result in money market equilibrium. At every point on the LM curve, $M/P = L(i)Y$. At every point off the LM curve, M/P is not equal to $L(i)Y$.

 - a. Draw an LM curve on an LM diagram. Pick a point above the LM curve. Tell me whether M/P is greater than or less than $L(i)Y$ at that point. Explain the intuition.
 - b. On the same diagram, identify a point below your LM curve. Tell me whether M/P is greater than or less than $L(i)Y$ at this point. Explain the intuition.
3. Shifting the LM curve
 - a. Draw two diagrams side by side, as in problem 1. On the left, draw the money market diagram, and show the initial equilibrium there as point A. On the right, draw an LM curve. Find point A on your LM curve, which has the same interest rate as point A in your money market diagram.
 - b. Suppose the Federal Reserve increases the money supply. Show the effects in the money market diagram under the assumption that Y remains at its initial value. In the LM diagram, assume that Y remains at its initial value, and show me the new interest rate. Draw a new LM curve through the initial value of Y and the new value of i . Congratulations, you have just shown how a change in M causes the LM curve to shift. Now, briefly explain the intuition.
 - c. Draw another set of diagrams such as in 2a. Now, suppose there's an exogenous increase in money demand: at each value of the interest rate, people demand more money than before (and, correspondingly, fewer bonds than before). This could occur, for example, if people become more concerned about the riskiness of holding bonds and making loans. Use the money market diagram to determine what must happen to the interest rate to restore money market equilibrium at the initial value of Y . Then, use your result to determine what happens to the LM curve. Explain the intuition.
 - d. Draw one more set of diagrams like in 2a. Suppose the price level exogenously increases. Determine the impact in both diagrams. If the LM curve shifts, explain the intuition for the shift.