

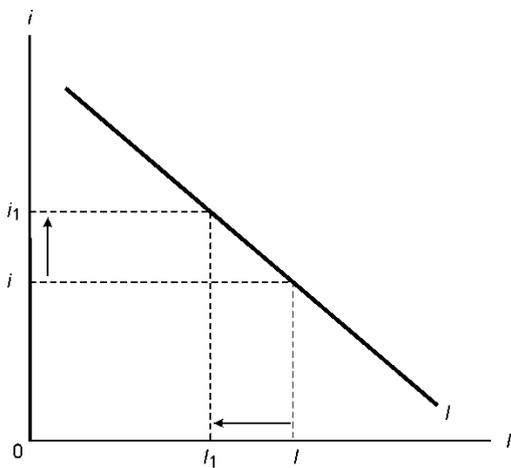
DERIVING THE IS CURVE

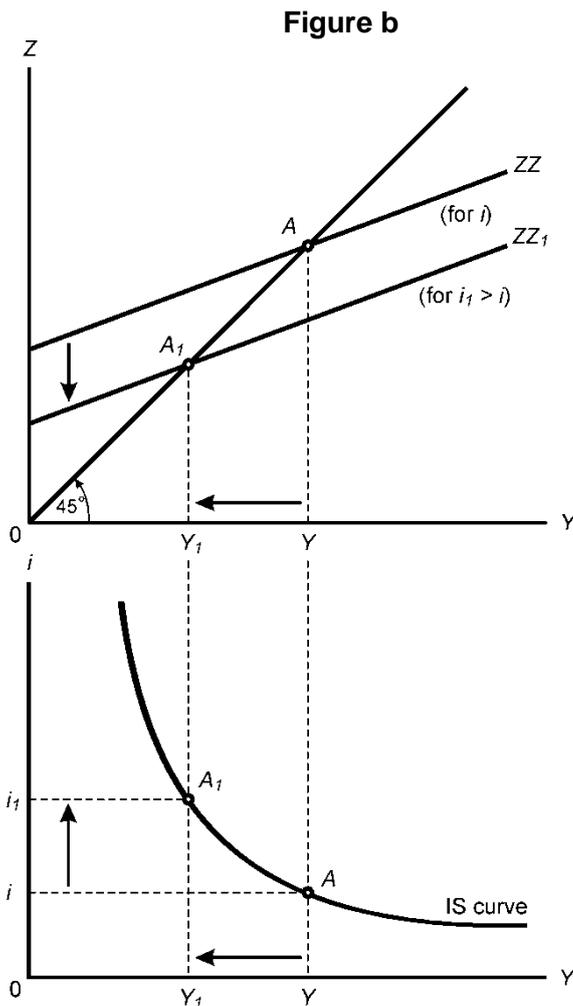
The IS curve gives us a picture of what happens in the goods market when the interest rate changes. To understand the IS curve you need to know the events that lie behind it, which you will grasp when you derive it. In the following example, the IS curve is derived by assuming that there is an increase in the interest rate.

The IS curve is derived, by assuming that the interest rate increases, with the aid of the following three figures:

- Figure a represents the investment function.
- Figure b represents the goods market, where $I = I(Y, i)$.
- Figure c depicts the IS curve.
- Note that the starting point for the derivation of the IS curve is a change in the interest rate.

Figure a





In figure a, the interest rate (i) is measured on the vertical axis and investment spending (I) on the horizontal axis.

In figure b, the demand for goods (Z) is measured on the vertical axis and the level of output and income (Y) on the horizontal axis.

In figure c, the interest rate (i) is measured on the vertical axis and the level of output and income (Y) on the horizontal axis.

Note that the level of income is measured on the horizontal axis for both the goods market (fig b) and the IS curve (fig c).

To plot the first point A:

- Step 1:** Assuming that the interest rate is i , the corresponding level of investment spending, according to the given investment schedule in figure a, is I .
- Step 2:** Given an interest rate of i with a level of investment spending I , the corresponding demand for goods in figure a is ZZ . Given this demand for goods, goods market equilibrium is reached at point A , where $Z = Y$.

- Step 3:* At this goods market equilibrium position A in figure b, the corresponding equilibrium level of output and income is Y.
- Step 4:* By extending this equilibrium level of income Y with a dotted line to figure c, we can plot our first point on our IS curve.
- Step 5:* The first point on our IS curve in figure c is plotted at the intersection of the dotted Y line with the dotted i line.
- Step 6:* The first point on our IS curve is also indicated as point A, because it corresponds to point A in figure b, thus indicating a goods market equilibrium position. At this point, the goods market is in equilibrium at an interest rate of i and an income level of Y.

Plotting the second point A₁:

- Step 7:* To derive the second point, we assume that there is an increase in the interest rate from i to i_1 . According to our investment schedule, the level of investment decreases to I_1 in figure a.
- Step 8:* In the goods market (fig b), the decline in investment spending decreases the demand for goods. The demand for goods curve shifts downwards to ZZ_1 . The shift in the demand for goods is equal to the decrease in investment (which is the result of an increase in the interest rate). At the initial level of equilibrium income Y, supply exceeds demand, and there is an adjustment to a lower level of output and income. The decline in output and income is a multiple of the decrease in investment spending owing to the multiplier effect.
- Step 9:* Goods market equilibrium is ultimately reached at point A_1 in figure b.
- Step 10:* At this new goods market equilibrium at point A_1 , the corresponding level of equilibrium income is Y_1 . The decrease in the equilibrium level of income from Y to Y_1 is equal to the multiplier times the change in investment.
- Step 11:* By extending this equilibrium level of income Y_1 in figure b with a dotted line to figure c, we can now plot our second point on our IS curve.
- Step 12:* The second point on our IS curve in figure c is plotted at the intersection of the dotted Y_1 line with the dotted i_1 line.
- Step 13:* The second point on our IS curve is also labeled as point A_1 because it corresponds to point A_1 in figure b, which indicates a goods market equilibrium position Y_1 at an interest rate of i_1 .

By repeating the same exercise for different interest rates, a series of goods market equilibrium points can be plotted in figure c, which ultimately gives us the IS curve.

We will take a short cut and draw a downward-sloping curve through points A and A_1 in figure c, and label it IS.

This then is our IS curve showing combinations of interest rates and income levels where the goods market is in equilibrium, given that all autonomous variables remain unchanged. This means that when the IS curve was derived, we assumed that variables such as government spending, taxation and consumer and investor confidence remained unchanged.

Note that the I in IS stands for investment and the S for savings.