Aggregate Demand Equals National Product

Describing the real sector of the economy, the IS curve represents the condition that aggregate demand equals national product.

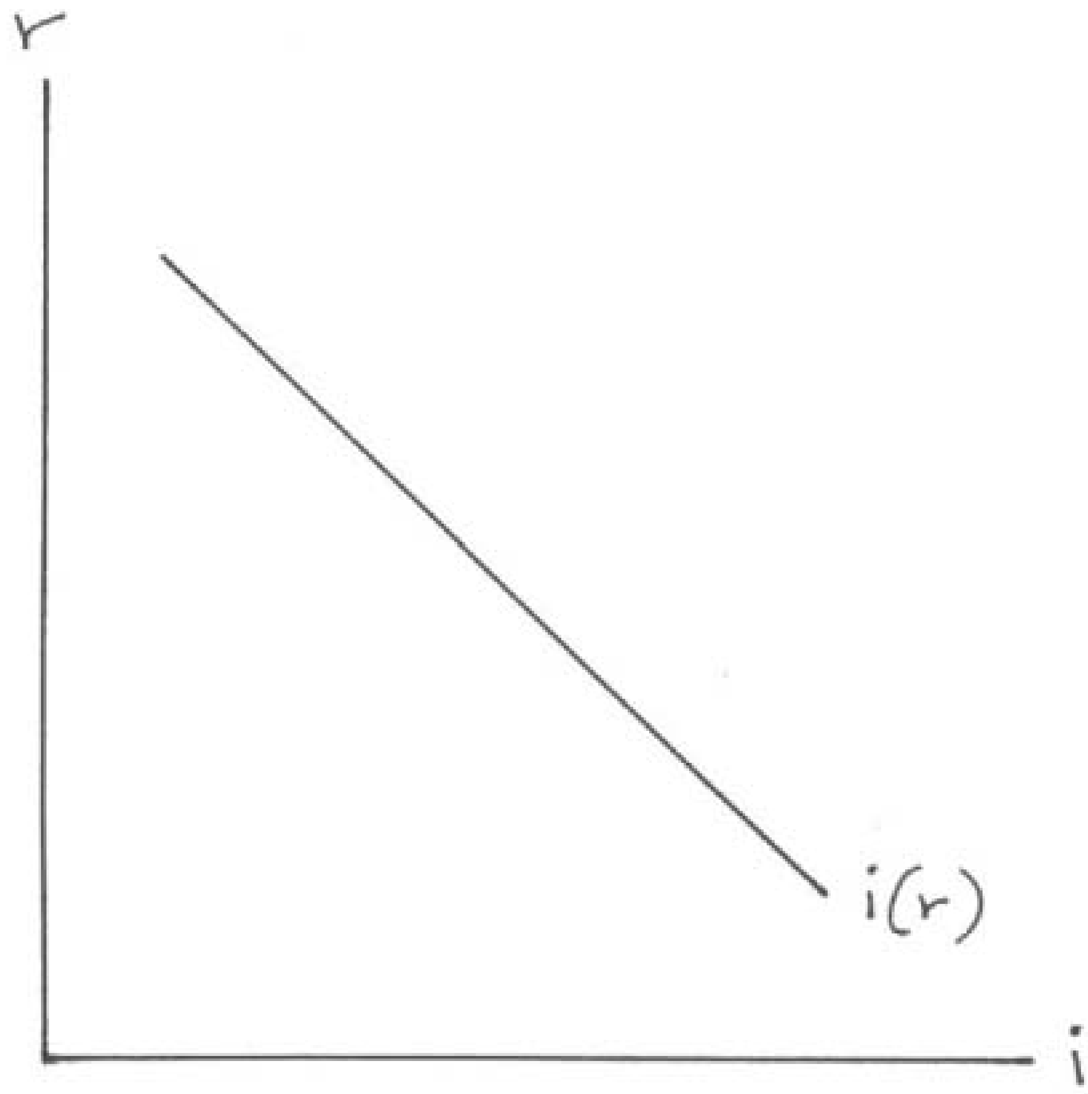
Whereas in the Keynesian cross model aggregate demand depended only on national income, now it depends as well on the interest rate.

Investment Demand

The interest rate is the cost of capital to the firm.

We model real investment demand as a decreasing function $i(r)$ of the real interest rate r (figure 1). As the cost of capital rises, the investment demand falls.

Figure 1: Investment Demand



Aggregate Demand Equals National Product

That aggregate demand equals national product means that consumption demand $c(y)$ plus investment demand $i(r)$ plus government expenditure on goods and services g equals national product y:

$$c(y) + i(r) + g = y. \tag{1}$$

Desired Investment Equals Desired Saving

The name "IS curve" derives from the property that it represents that desired investment equals desired saving.

Let t denote taxes. Rearranging (1) gives

$$i(r) = [y - t - c(y)] + (t - g).$$

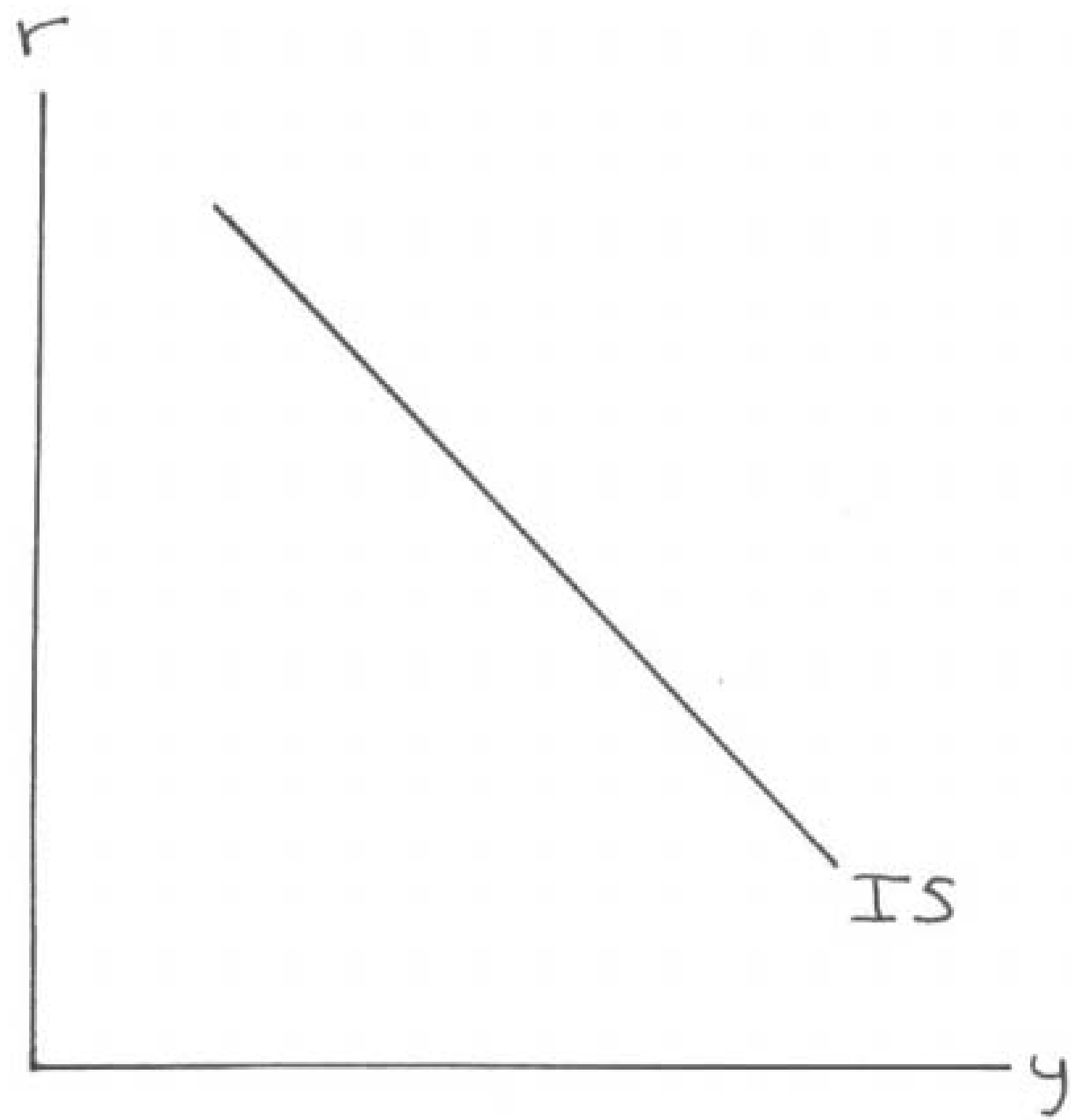
The left-hand side is desired investment. The right-hand side is desired saving: $y - t - c(y)$ is household saving (disposable income $y - t$ less consumption demand), and the government surplus $t - g$ is government saving.

IS Curve

Think of the national income and product y and the interest rate r as defining the state of the economy. Given these two variables, one can determine the aggregate demand.

In figure 2, the IS curve shows the combinations of y and r such that aggregate demand equals national product.

Figure 2: IS Curve



Downward-Sloping IS Curve

The IS curve is downward sloping. When the interest rate falls, investment demand increases, and this increase causes a multiplier effect on consumption, so national income and product rises.

Flat or Steep?

If investment demand is highly sensitive to the interest rate, then a reduction in the interest rate causes a big increase in national income and product. Hence the IS curve is flat.

If the marginal propensity to consume is high, then a given change in investment demand causes a big increase in national income and product. Hence the IS curve is flat.

Keynesian Cross

In the Keynesian cross model, investment demand is exogenous. If investment demand is independent of the interest rate, then the IS curve is vertical. Aggregate demand sets the national income and product, regardless of the interest rate.

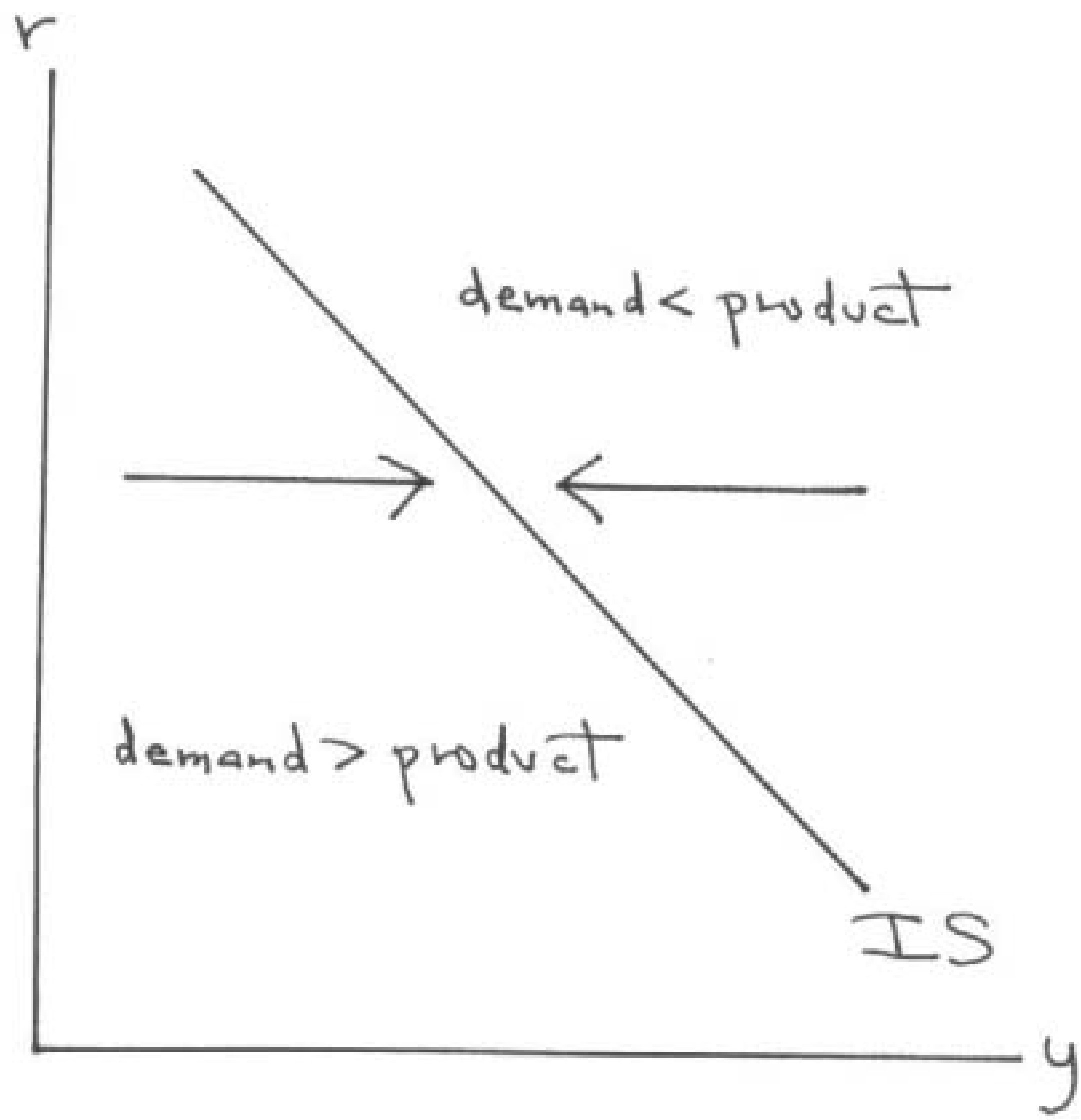
Adjustment to the IS Curve

National product adjusts to put the economy on the IS curve in the short run (figure 3).

To the left of the IS curve, aggregate demand exceeds the product, so firms expand production to meet demand.

To the right, aggregate demand is less than the national product. Firms reduce production, since they will not produce what they cannot sell.

Figure 3: Adjustment to the IS Curve



Multiplier Effect

A change in autonomous demand shifts the IS curve right or left. The horizontal shift is the change in autonomous demand times the multiplier $1/(1-mpc)$.