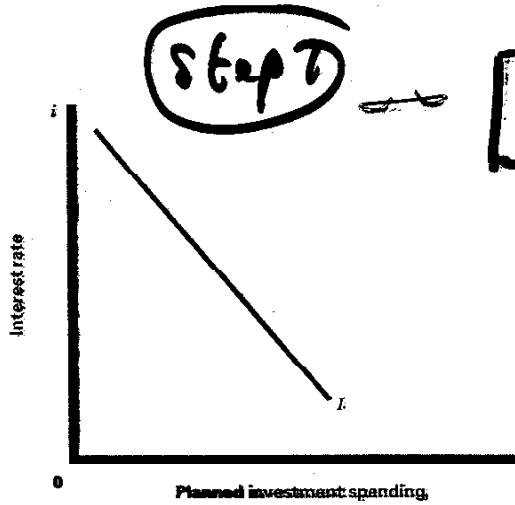


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10.3.1

new term



Step 1

$$I = \bar{I} - b \cdot i$$

$$i = \frac{\bar{I}}{b} - \frac{I}{b}$$

FIGURE 10-4

THE INVESTMENT SCHEDULE. The investment schedule shows the planned level of investment spending at each rate of interest. Because higher interest rates reduce the profitability of additions to the capital stock, higher interest rates imply lower planned rates of investment spending. Changes in autonomous investment shift the investment schedule.



The Interest Rate and Aggregate Demand / The IS Curve

We now modify the aggregate demand function of Chapter 3 to reflect the new planned investment spending schedule. Aggregate demand still consists of the demand for consumption, investment, and government spending on goods and services, only now investment spending depends on the interest rate. We have

Step 2

$$AD \equiv C + I + G$$

$$= c\bar{T}R + c(1 - t)Y + \bar{I} - bi + \bar{G} \quad (3)$$

$$= \bar{A} + cY - bi$$

new term

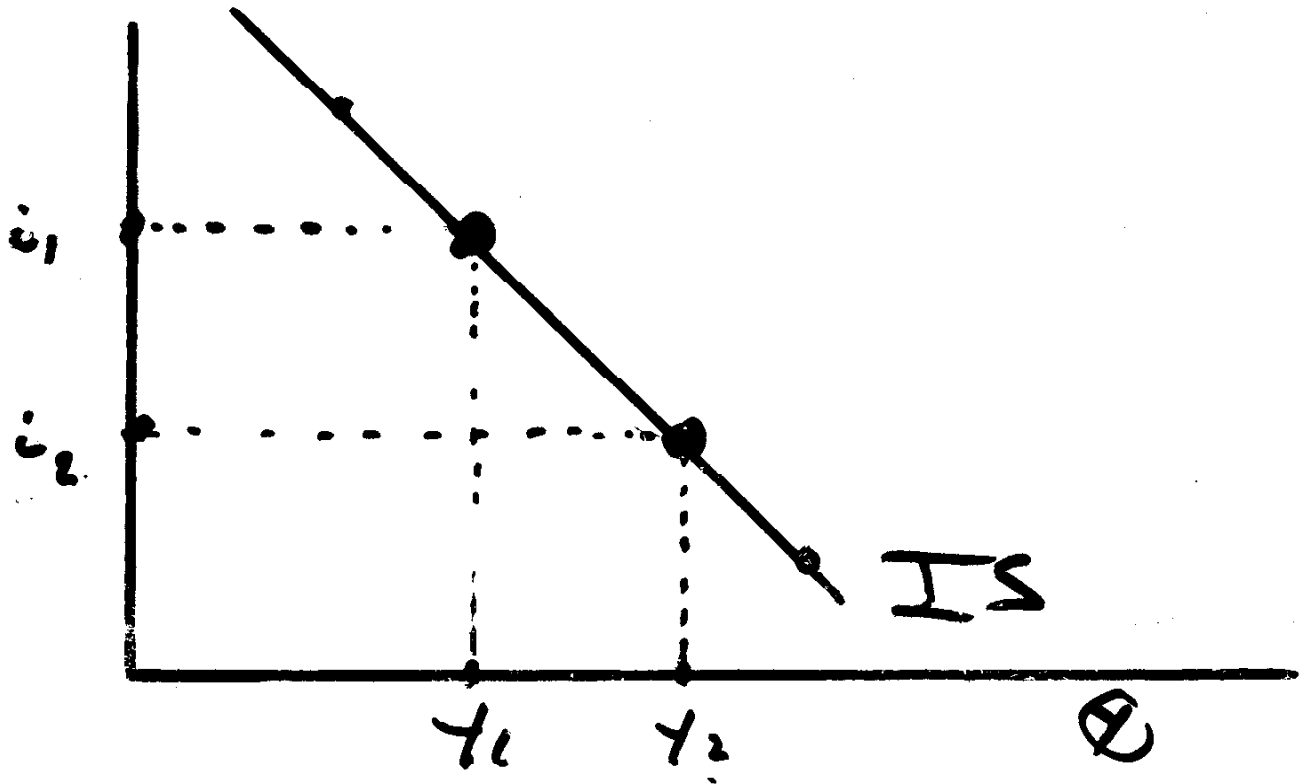
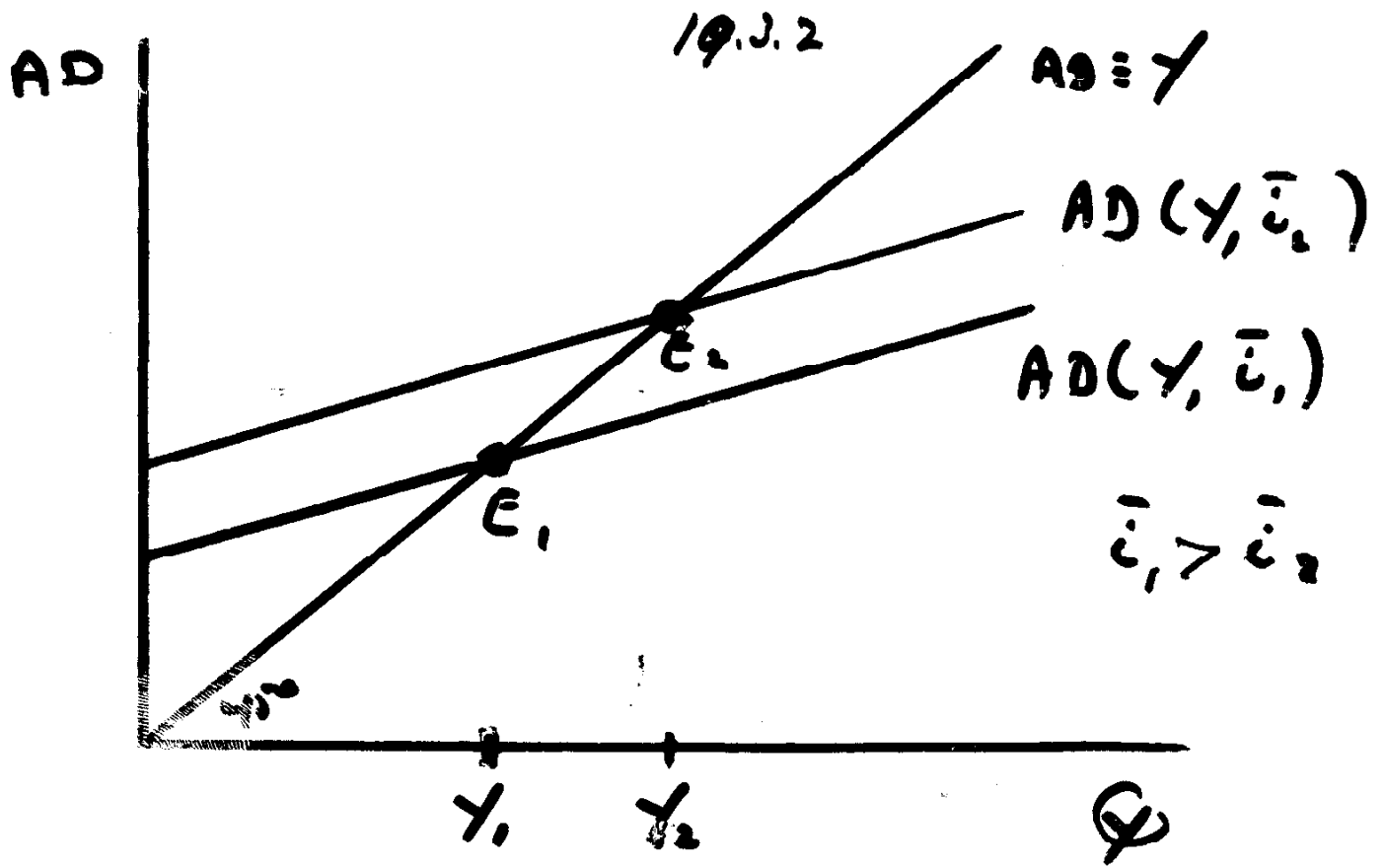
where

$$\bar{A} \equiv c\bar{T}R + \bar{I} + \bar{G} \quad (4)$$

Step 3
make a graph

From equation (3) we see that an increase in the interest rate reduces aggregate demand for a given level of income because a higher interest rate reduces investment spending. Note that the term \bar{A} , which is the part of aggregate demand unaffected by either the level of income or the interest rate, does include part of investment spending, namely, \bar{I} . As noted earlier, \bar{I} is the *autonomous* component of investment spending, which is independent of the interest rate (and income).

At any given level of the interest rate, we can still proceed as in Chapter 3 to



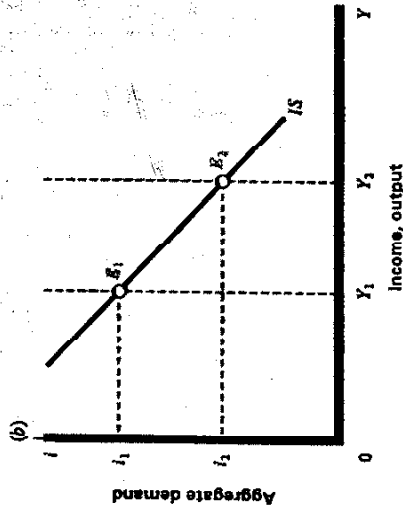
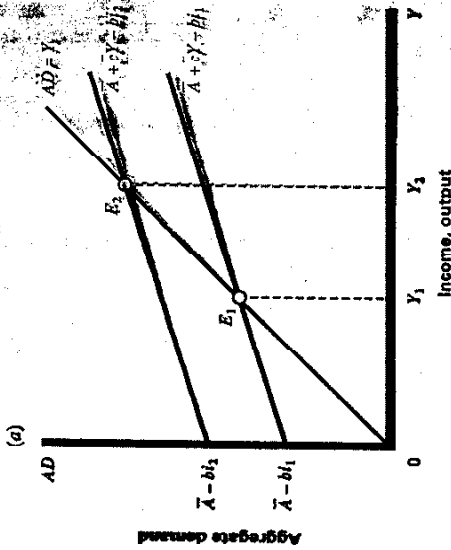


FIGURE 10-4

DERIVATION OF THE IS CURVE. At an interest rate i_1 , equilibrium in the goods market is at point E_1 in the upper panel with an income level Y_1 . In the lower panel this is recorded as point E_1 , also. A fall in the interest rate to i_2 raises aggregate demand, increasing the level of spending at each income level. The new equilibrium income level is Y_2 . In the lower panel, point E_2 records the new equilibrium in the goods market corresponding to an interest rate i_2 .

Figure 10-4 shows that the IS curve is negatively sloped, reflecting the increase in aggregate demand associated with a reduction in the interest rate. We can also derive the IS curve by using the goods market equilibrium condition, that income equals planned spending, or

$$Y = AD = \bar{A} + cY - bi \quad (5)$$

which can be simplified to

$$Y = \alpha_G(\bar{A} - bi) \quad \alpha_G = \frac{1}{1 - c} \quad (6)$$

where α_G is the multiplier of Chapter 3. Equation (6) should be compared with (1) at the beginning of this chapter. Note from equation (6) that a higher interest rate implies a lower level of equilibrium income for a given \bar{A} , as Figure 4-4 shows.

The construction of the IS curve is quite straightforward and may even be deceptively simple. We can gain further understanding of the economics of the IS curve by asking and answering the following questions:

- What determines the slope of the IS curve?
- What determines the position of the IS curve, given its slope, and what causes the curve to shift?
- What happens when the interest rate and income are at levels such that we are not on the IS curve?

$$Y = \bar{A} + cY - bi$$

$$(1-c)Y = \bar{A} - bi$$

$$bi = \bar{A} - (1-c)Y$$

$$i = \frac{\bar{A}}{b} - \frac{(1-c)}{b}Y$$

IS CURVE

10.3.2

19.3.4

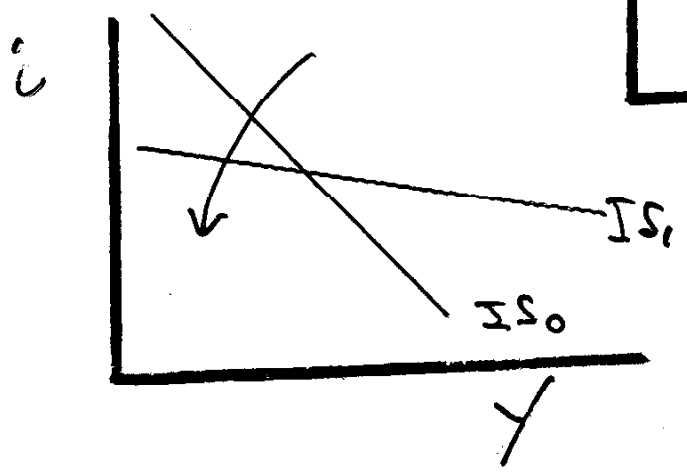
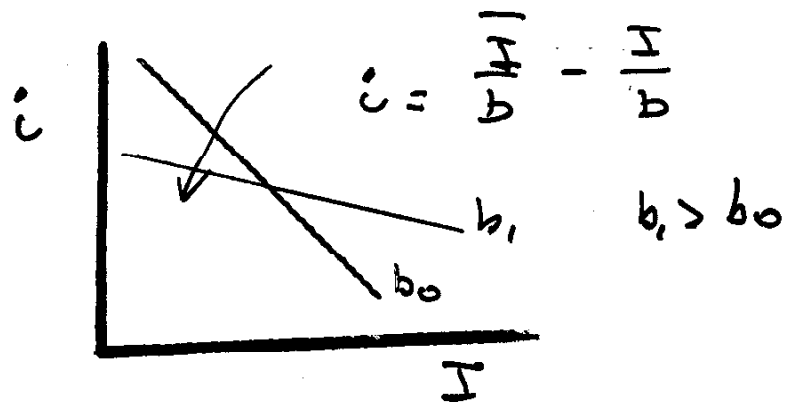
$$\dot{i} = \frac{\bar{A}}{b} - \frac{(1-c)}{b} \cdot Y$$

IS curve

Parameters \bar{A}, b, c

- $\Delta \bar{A}$: an increase in autonomous spending
 - a parallel outward shift of the IS curve
- $\Delta c > 0$: an increase in the marginal propensity to consume
 - a flatter IS curve

$$\bullet \Delta b > 0$$



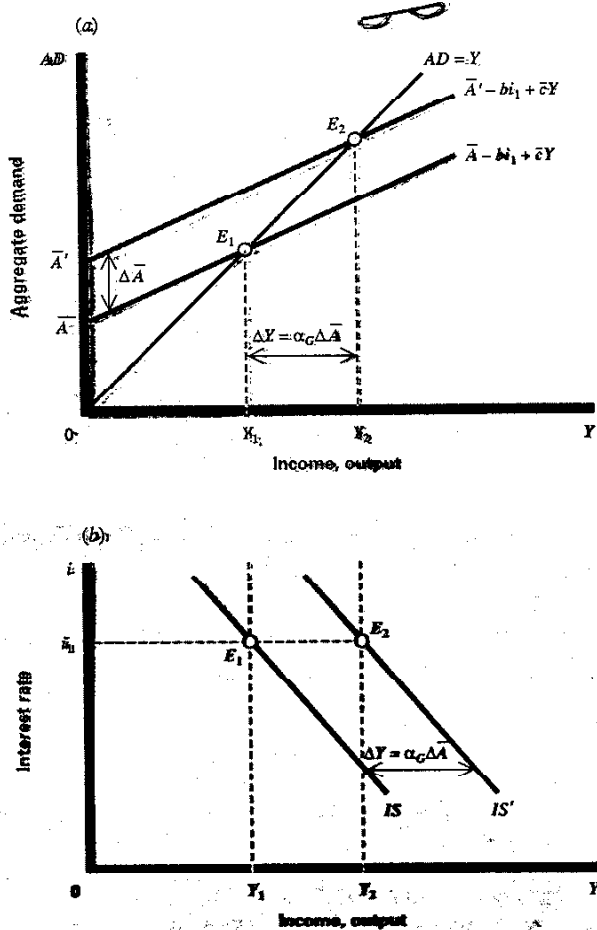


FIGURE 19-6
A SHIFT IN THE IS CURVE CAUSED BY A CHANGE IN AUTONOMOUS SPENDING. An increase in aggregate demand due to higher autonomous spending shifts the aggregate demand curve in part (a) up, raising the equilibrium level of output at interest rate i . The IS schedule in part (b) shifts. At each level of the interest rate, equilibrium income is now higher. The horizontal shift of the IS schedule is equal to the multiplier times the increase in autonomous spending.

$$i = \frac{\bar{A}}{b} - \frac{(1-c)}{b} \cdot Y$$

$$\Delta \bar{A}$$

The Slope of the IS Curve

We have already noted that the IS curve is negatively sloped because a higher level of the interest rate reduces investment spending, thereby reducing aggregate demand

10.3.6

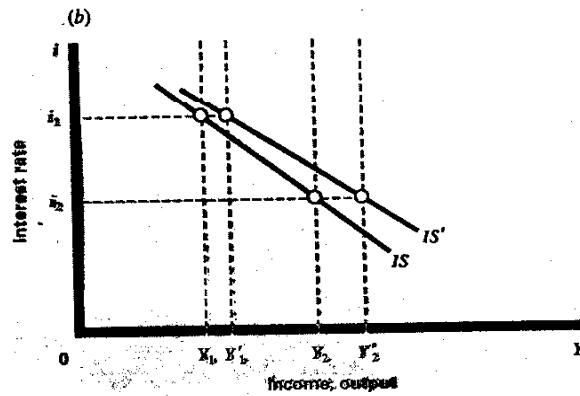
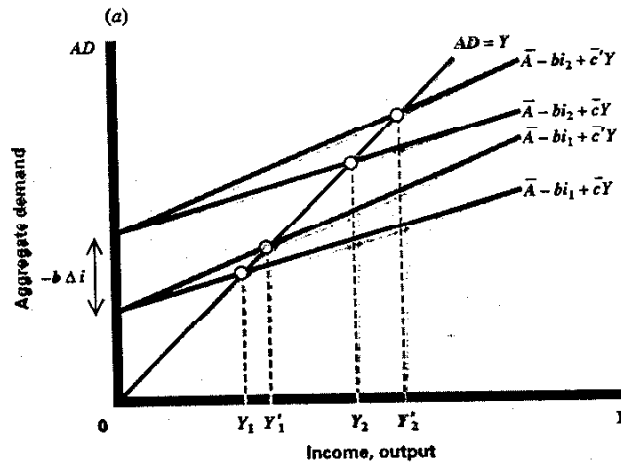


FIGURE 10.3

EFFECTS OF THE MULTIPLIER ON THE STEEPNESS OF THE IS CURVE. The diagram shows that corresponding to a higher marginal propensity to spend, and hence a steeper aggregate demand schedule, there is a flatter IS schedule.

$$i = \frac{\bar{A}}{b} - \frac{(1-c)}{b} \cdot Y$$

Slope of IS Curve = $\frac{\Delta i}{\Delta Y} = -\frac{(1-c)}{b}$

10.3.7

$b > 0$

$$I = \bar{I} - b \cdot i$$

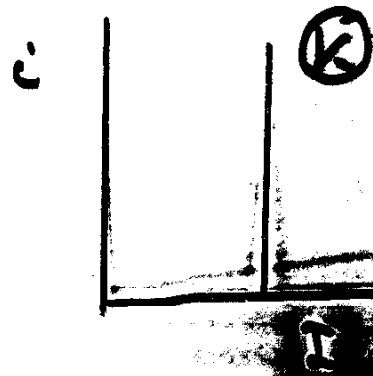
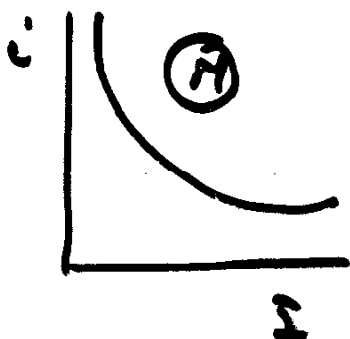
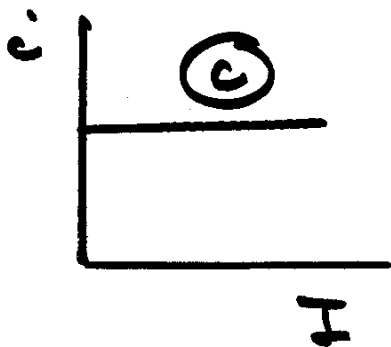
$$\frac{\Delta I}{\Delta i} \cdot \frac{i}{I} = e_{I,i}$$

$e_{I,i}$ = investment - interest rate elasticity

• Classical $e_{I,i} \rightarrow -\infty$

• Monetarist $e_{I,i} \rightarrow -1$

• Keynes $e_{I,i} \rightarrow 0$



Positions off the IS Curve

10.3.8

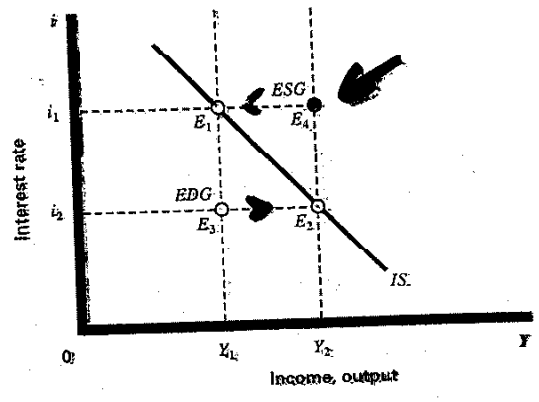


FIGURE 10-7
 EXCESS SUPPLY (ESG) AND DEMAND (EDG) IN THE GOODS MARKET.
 Points above and to the right of the IS schedule correspond to an excess supply of goods, and points below and to the left to an excess demand for goods. At a point such as E_4 , interest rates are higher than at E_2 on the IS curve. At the higher interest rates, investment spending is too low, and thus output exceeds planned spending and there is an excess supply of goods.

- Assume we are at point E_1 ; then $AD = AS$
 - assume that for given output Y_1 , we lower i_1 . That stimulates investment.
 Therefore $AD > AS$ at E_3 . $\Delta Y > 0$
- Assume we are at point E_2 ; then $AD = AS$
 - assume that for given output Y_2 we increase i_2 . That decreases investment.
 Therefore at E_4 $AD < AS$. $\Delta Y < 0$

IS curve

10.3.9

$$i = \frac{\bar{A}}{b} - \frac{(1-c)}{b} \cdot Y$$

$$\bar{A} > 0$$

$$b > 0$$

$$0 < c < 1$$

• intercept

$$\frac{\bar{A}}{b}$$

: causes of changes therein

• Slope

$$-\left(\frac{1-c}{b}\right)$$

: causes of changes therein

Solutions techniques

- descriptive
- graphical
- calculus

Solution technique 10.10.10

• calculus

• tak. derivative

$$i = \frac{\bar{A}}{b} - \frac{(1-c)}{b} \cdot Y$$

$$\Delta i / \Delta Y = -\left(\frac{1-c}{b}\right)$$

Question: What happens to the slope of the IS curve if the MPC increases?

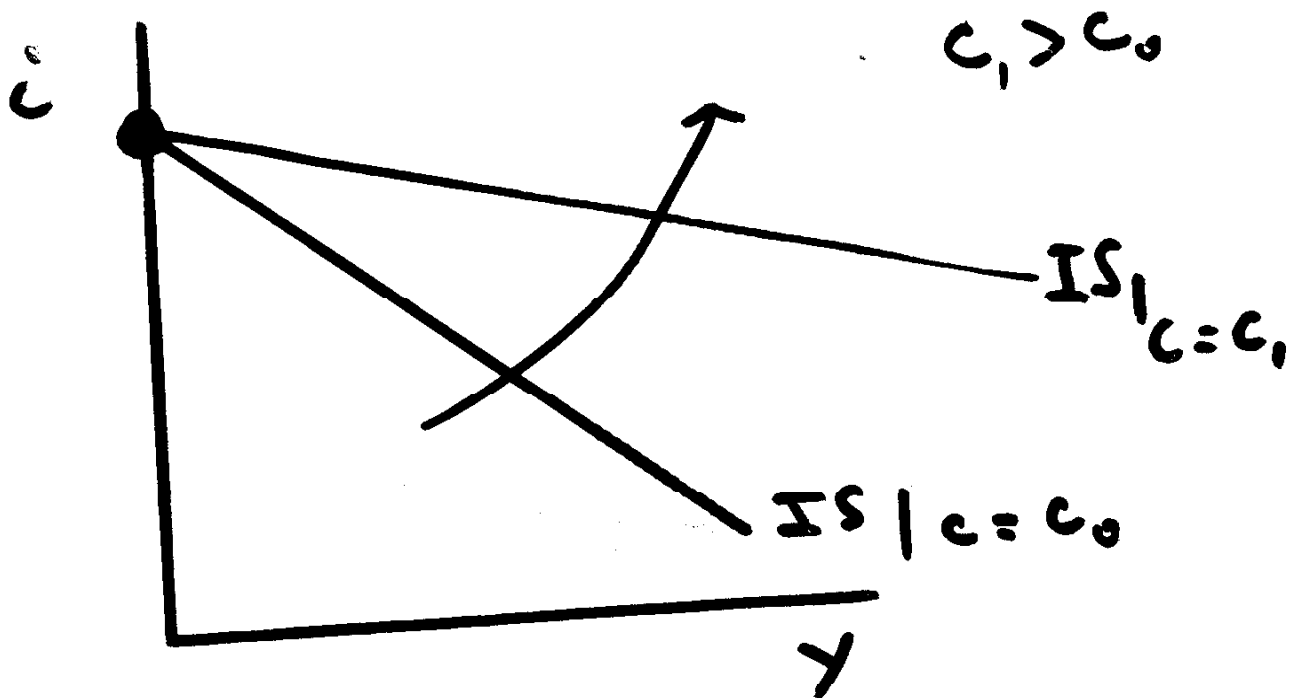
Answer:

$$\Delta \frac{\Delta i}{\Delta Y} / \Delta c = \frac{\Delta \left[-\frac{(1-c)}{b} \right]}{\Delta c} = \frac{1}{b} > 0$$

10.1.11

$$\Delta \frac{\Delta i / \Delta y}{\Delta c} = \frac{1}{b} > 0$$

if $\Delta c > 0$ then the slope of the IS curve becomes larger



"An increase in MPC makes the IS curve flatter"

fig 4-5