

The IS Curve
ECON 4673
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Answers

1. *Why is inventory investment counted as part of gross domestic product if the goods are not yet sold to the final end user?*

Gross domestic product is a measure of production. Thus, produced goods that remain unsold to the final end user are included in gross domestic product via inventory investment. Those goods then remain in inventories until they are sold to the final end user.

2. *If households and firms begin to believe the economy will enter in a recession in the near future, will this change in expectations cause a recession or have an impact on output?*

Changes in expectations can very well lead to a recession. If the change in expectations is strong enough, this change could significantly reduce autonomous consumption and autonomous planned investment to the point where equilibrium output decreases and the economy goes into a recession.

3. *Why does an increase in the real interest rate lead to a decrease in net exports?*

When the real interest rate rises, the demand for domestic assets increases, which leads to an appreciation of the domestic currency. That change causes imported goods to become cheaper domestically and exported goods to become more expensive overseas. Those changes cause exports to decline and imports to rise which results in a fall in net exports. Thus, an increase in the real interest rate leads to a decline in net exports.

4. *In each of the cases, determine how equilibrium output changes and whether the IS curve shifts to the right or left, moves up or down along the curve, or does change at all.*

- a. *The real interest rate rises.*

The rise in the real interest rate pushes down equilibrium output. That change is represented by an upward movement along the IS curve.

- b. *Financial frictions increase.*

The rise in financial frictions leads to decline in equilibrium output at any given interest rate, which shifts the IS curve to the left.

- c. *Autonomous consumption decreases.*

The decrease in autonomous consumption causes equilibrium output to fall at any given interest rate, which shifts the IS curve to the left.

d. *Taxes decrease.*

A reduction in taxes increases equilibrium output at any given interest rate, which shifts the IS curve to the right.

e. *The sensitivity of net exports to changes in the real interest rate decreases.*

A decline in the sensitivity of net exports to changes in the real interest rate pushes up net exports. That change leads to an increase in equilibrium output at any given interest rate, which shifts the IS curve to the right.

f. *The government provides tax incentives for firms to increase their amount of research and development.*

The tax incentives raise autonomous planned investment. That change pushes up equilibrium output at any given interest rate, which shifts the IS curve to the right.

5. *Assume that autonomous consumption is \$1,625 billion and disposable income is \$11,500 billion. Calculate the level of consumption if an increase of \$1,000 in disposable income leads to an increase of \$750 in consumption expenditure.*

If an increase of \$1,000 in disposable income raises consumption by \$750, then $MPC = 750/1,000 = 0.75$. Thus, the consumption function indicates

$$C = 1,625 + 0.75 \times 11,500$$
$$C = \$10,250 \text{ billion}$$

6. *Consider an economy described by the following data: $\bar{C} = \$3.25$ trillion, $\bar{I} = \$1.3$ trillion, $\bar{G} = \$3.5$ trillion, $\bar{T} = \$3.0$ trillion, $\bar{NX} = -\$1.0$ trillion, $MPC = 0.75$, $d = 30$, $x = 10$, and $\bar{f} = 0.01$.*

a. *Derive expressions for the consumption function, the investment function, and the net export function.*

$$C = 3.25 + 0.75 \times (Y - 3) = 1 + 0.75 \times Y$$
$$I = 1.3 - 30 \times (r + 0.01) = 1 - 30 \times r$$
$$NX = -1 - 10 \times r$$

b. *Derive an expression for the IS curve.*

The IS curve can be found by setting $Y = C + I + \bar{G} + NX$:

$$Y = 1 + 0.75 \times Y + 1 - 30 \times r + 3.5 - 1 - 10 \times r$$
$$0.25 \times Y = 4.5 - 40 \times r$$
$$Y = 18 - 160 \times r$$

c. *If the real interest rate is $r = 0.02$, what is equilibrium output? If $r = 0.05$, what is equilibrium output?*

If $r = 0.02$, then equilibrium output is $Y = 18 - 160 \times 0.02 = \14.8 trillion.

If $r = 0.05$, then equilibrium output is $Y = 18 - 160 \times 0.05 = \10 trillion.