

ECOS2002 - Tutorial 2 Solution

The Goods Market

1. Keynesian Cross

Consider the simple model of the good markets:

$$\begin{aligned}Z &= C + I + G \\C &= c_0 + c_1(Y - T) \\I &= \bar{I} \\G &= \bar{G} \\T &= \bar{T}\end{aligned}$$

Assignment Project Exam Help

(a) What is the difference between c_0 and c_1 ?

Answer:

- c_0 : **Autonomous consumption**: Reflects changes in consumption for a given level of disposable income.
- c_1 : **Marginal propensity to consume**: Gives the effect an additional dollar of disposable income has on consumption.

(b) Derive the equilibrium condition in the goods market:

Answer:

$$Z = c_0 + c_1(Y - \bar{T}) + \bar{I} + \bar{G}$$

In equilibrium, supply equals demand ($Y = Z$):

$$\begin{aligned}Y &= c_0 + c_1(Y - \bar{T}) + \bar{I} + \bar{G} \\(1 - c_1)Y &= c_0 - c_1\bar{T} + \bar{I} + \bar{G} \\Y &= \frac{1}{1 - c_1}[c_0 - c_1\bar{T} + \bar{I} + \bar{G}]\end{aligned}$$

(c) Identify and explain the multiplier

Answer:

$$\text{Multiplier} : \frac{1}{1-c_1}$$

Intuition: One person's spending is another person's income. Assume that $c_1 = 0.6$, i.e., if income increases by \$1, 60 cents are used for consumption. Consumption is nothing less than another person's income (think of a shop owner). The shop owner now makes 60 cents more income, and since we assume everyone in our economy behaves the same, she will spend $0.6 \times 0.60 = \$0.36$ cents of it in another store. The new shop owner now spends $0.6 \times 0.36 = \$0.216$ and so on...

In total the multiplier will lead to an increase of $\frac{1}{1-0.6} = 2.5$ dollars of total income after an initial increase of \$1.

2. Assume the behavioural equation for taxes changes to:

$$T = t_0 + t_1 Y$$

- (a) Explain the behavioural equation for taxation in words

Answer: The equation represents automatic stabilizers by explicitly depending on the level of income. This dependence means that T will automatically change when income changes. An example for the tax equation is an income tax. As income rises, the total tax burden of the economy rises. This automatically stabilizes the business cycle.

- (b) Derive the new equilibrium condition. Will the multiplier change?

Answer:

$$Z = c_0 + c_1[Y - (t_0 + t_1 Y)] + \bar{I} + \bar{G}$$

In equilibrium, supply equals demand ($Y = Z$):

$$\begin{aligned} Y &= c_0 + c_1(Y - t_0 - t_1 Y) + \bar{I} + \bar{G} \\ (1 - c_1(1 - t_1))Y &= c_0 - c_1 t_0 + \bar{I} + \bar{G} \\ Y &= \frac{1}{1 - c_1(1 - t_1)}[c_0 - c_1 t_0 + \bar{I} + \bar{G}] \end{aligned}$$

The multiplier with automatic stabilizers is smaller:

$$\frac{1}{1-c_1} > \frac{1}{1-c_1(1-t_1)}$$

[You can also show this graphically by adjusting the slope in the income expenditure model. The slope of the demand curve is now $c_1(1 - t_1)$ rather than c_1 so the curve becomes flatter in the Keynesian Cross model.]

3. **Paradox of Thrift** Consider the simple model of the good markets:

$$\begin{aligned} Z &= C + I + G \\ C &= c_0 + c_1(Y - T) \\ I &= \bar{I} \\ G &= \bar{G} \\ T &= \bar{T} \end{aligned}$$

Saving in the simple model of the goods market is defined as $S = Y - C - G$. Using the goods market equilibrium and the definition of saving, find the predicted change in equilibrium aggregate savings if consumers decided to save more ($c_0 \downarrow$). Explain why the effect of an aggregate increase in savings is called a paradox using your answer.

Answer: This change will have two competing effects:

$$\begin{aligned} S &= (Y - C - G) \\ S &= (Y - c_0 - c_1(Y - T) - G) \\ S \downarrow &\Rightarrow c_0 \downarrow \end{aligned}$$

Assignment Project Exam Help

<https://powcoder.com>

When $-c_0$ is lower (less negative), consumers are saving more at any level of income. However, their income Y is also lower (income is a function of c_0) which decreases saving. The net effect of those two ambiguous effects is zero.

Add WeChat powcoder

The Paradox of Thrift: If everyone increases saving at the same time, the equilibrium effect is no additional saving in the economy. One person spending is another's income, so in this model income falls and results in no additional saving. The paradox is thus that increasing saving leads to no additional aggregate savings in equilibrium.

4. **Discussion** Consider the following statement:

Changes in government purchases have a more powerful effect on the economy than equal-sized changes in taxes or transfers.

Do you agree? Explain!

Answer: A few things could be discussed here:

- Mathematically:

The expenditure multiplier describes the increase in real GDP after an increase in government spending G .

$$\Delta \bar{G} = \frac{1}{1 - c_1}$$

The tax multiplier describes the increase in real GDP after a decrease in taxation T .

$$\Delta \bar{T} = \frac{c_1}{1 - c_1}$$

Since $0 < c_1 < 1$, the tax multiplier is smaller than the government spending multiplier.

- Intuitively:

Both an increase in government spending and a reduction in taxes are expansionary fiscal policy and are meant to stimulate the economy. The idea is that when the government reduces taxes, private spending will increase. However, government spending is a direct injection into the economy whereas households will save a portion of their additional income if given a choice. So, a tax reduction leads to additional spending but also additional saving making the tax multiplier smaller.

- So why Do Economists Still Disagree over Government Spending Multipliers?

- A few points could be discussed her, for instance:
 - Government debt has to be paid back eventually. Potentially by increasing taxes in the future. (We will talk about this point later in class).
 - The multiplier is hard to measure
 - Government spending are a broad term, maybe not every spending activity is equally effective in increasing aggregate demand (social expenditure vs. military expenditure)
 - Tax incentives are popular with politicians, particularly before elections.