Government and Fiscal Policy Part 2

The Balanced-Budget Multiplier *(1 of 2)*

- Balanced Budget: **G = T** which implies ΔG = ΔT.
- **balanced-budget multiplier** The ratio of change in the equilibrium level of output to a change in government spending where the change in government spending is balanced by the change in net taxes.
- **The balanced-budget multiplier is equal to 1.**
- **ΔY from ΔG and the equal ΔT is exactly the same size as the initial ΔG or ΔT.**

Example – 1

Suppose that ΔG = ΔT = 50 (i.e. balanced budget).

The result will ALWAYS be that ΔY = ΔG = ΔT.

In this case, we will have ΔY = 50.

This is because

$$\frac{\Delta Y}{\Delta G} + \frac{\Delta Y}{\Delta T} = 1$$

$$\frac{1}{MPS} + (-\frac{MPC}{MPS}) = 1$$

Example – 2

Question

Suppose the Govt wants to increase equilibrium output from 80 to 100 units.

If the Govt were to adopt balanced budget, how much G and T should the Govt raise?

Answer

The Govt should raise G **AND** T by 20. As a result, Y will increase by 20 units because the multiplier is 1.

TABLE 9.3 Finding Equilibrium after a Balanced-Budget Increase in *G* and *T* of 200 Each*

(1) Output (Income) Y	(2) Net Taxes T	(3) Disposable Income $Y_d \equiv Y - T$	(4) Consumption Spending $C = 100 + .75\ Y_d$	(5) Planned Investment Spending I	(6) Government Purchases G	(7) Planned Aggregate Expenditure C + I + G	(8) Unplanned Inventory Change Y − (C + I + G)	(9) Adjustment to Dis-equilibrium
500	300	200	250	100	300	650	−150	Output ↑
700	300	400	400	100	300	800	−100	Output ↑
900	300	600	550	100	300	950	-50	Output ↑
1,100	300	800	700	100	300	1,100	0	Equilibrium ↑
1,300	300	1,000	850	100	300	1,250	+50	Output ↑
1,500	300	1,200	1,000	100	300	1,400	+100	Output ↑

* Both *G* and *T* have increased from 100 in Table 24.1 to 300 here.

TABLE 9.4 Summary of Fiscal Policy Multipliers

	Policy Stimulus	Multiplier	Final Impact on Equilibrium Y
Government spending multiplier	Increase or decrease in the level of government purchases: ΔG	$\frac{1}{MPS}$	$\Delta G \times \frac{1}{MPS}$
Tax multiplier	Increase or decrease in the level of net taxes: ΔT	$\frac{-MPC}{MPS}$	$\Delta T \times \frac{-MPC}{MPS}$
Balanced-budget multiplier	Simultaneous balanced-budget increase or decrease in the level of government purchases and net taxes: $\Delta G = \Delta T$	1	ΔG

The Balanced-Budget Multiplier *(2 of 2)*

A Warning

- Although we have added government, the story told about the multiplier is still incomplete and oversimplified.
- We have been treating net taxes (*T*) as a lump-sum, fixed amount, whereas in practice, taxes depend on income.

An IMPORTANT Remark – 1

- When calculating GDP, transfer payment will not be included in the calculation. This is because there is NO new production.

- This is the same in the DAE. Transfer payment is not included in G.

An IMPORTANT Remark – 2

- G counts only government purchases of output (such as roads, schools, and missiles).
- In the DAE, transfer payment is considered “negative taxes”.
- T denotes net taxes = taxes – transfer payment.

Short Summary – 1

- We have two approaches to find the equilibrium in the Keynesian Cross.
  - Y = DAE (or Y = AE) Approach
  - Saving/Investment Approach

- Y = DAE is also called "income = expenditure".
- "Saving/Investment" is also called **"leakage = injection"** approach.

Short Summary – 2

The Equilibrium Condition of the Y = DAE:

- Closed Econ w/o Govt: $Y = AE = C + I$
- Closed Econ w/ Govt $Y = AE = C + I + G$
- Open Econ w/ Govt $Y = AE$

$= C + I + G + (X – M)$

Short Summary – 3

The Equilibrium Condition of the Saving/Investment Approach:

- Closed Econ w/o Govt: S = I
- Closed Econ w/ Govt S + T = I + G
- Open Econ w/ Govt S + T + M = I + G + X
- The left-hand side is called “leakages”.
- The right-hand side is called “injections”.

Short Summary – 4

Saving Function (used in S/I Approach)

- If there is no Govt, Y = C + S.

  That is, income is divided into C and S.

- If there is Govt, Yd = C + S.

  We can rewrite Y – T = C + S or Y = C + S + T.

  That is, income is divided into C, S, and T.

  You spend, save, and pay taxes.

OPEN Economy with Govt – 1

- We now introduce Import (M) and Export (X) into the DAE.
- The Equilibrium Condition becomes

$$Y = DAE = C + I + G + (X - M)$$

OPEN Economy with Govt – 2

- We assume that X is given and constant.

  That is, $X = x$ (some number x).

- We assume that M depends on Y.

  That is, $M = k + j(Y)$

where k is the import when $Y = 0$

j is the marginal propensity to import

(MPM) and $0 < J < 1$.

OPEN Economy with Govt – 3

Example Find the equilibrium.

$C = 300 + 0.75(Yd)$

$I = 50$

$G = 50$

$T = 50$

$X = 50$

$M = 100 + 0.25Y$

Y = DAE Approach – 1

We start with the equilibrium condition:

$Y = AE = C + I + G + (X - M)$

$Y = 300 + 0.75(Y - T) + I + G + X - (100 + 0.25Y)$

$Y = 300 + 0.75(Y - 50) + 150 - (100 + 0.25Y)$

$Y - 0.75Y + 0.25Y = 450 - 0.75(50) - 100$

$0.5Y = 350 - 37.5 = 312.5$

$Y^* = 625$

Y = DAE Approach – 2

- Drawing the Keynesian Cross

$AE = C + I + G + (X - M)$

$AE = 300 + 0.75(Y - 50) + 150 - (100 + 0.25Y)$

$AE = 312.5 + 0.5Y$

Intercept = 312.5

Slope = 0.5 = MPC – MPM

<u>*The slope is NOT equal to MPC anymore.***</u>**

Finding the Multipliers – 1

Y = C + I + G + (X – M)

Let C = a + b(Y – T) and M = k + j(Y)

Y = a + b(Y) – b(T) + I + G + X – (k + j(Y))

Y = a + b(Y) – b(T) + I + G + X – k – j(Y)

Y – b(Y) + j(Y) = a – b(T) + I + G + X – k

(1 – b + j)Y = a – b(T) + I + G + X – k

$$Y = \frac{1}{1 - b + j}(a - b(T) + I + G + X - k)$$

Finding the Multipliers – 2

- $Y = \frac{1}{1-b+j}(a - b(T) + I + G + X - k)$
- $\frac{\Delta Y}{\Delta I} = \frac{1}{1-b+j}$
- $\frac{\Delta Y}{\Delta G} = \frac{1}{1-b+j}$
- $\frac{\Delta Y}{\Delta T} = \frac{-b}{1-b+j}$
- $\frac{\Delta Y}{\Delta T} + \frac{\Delta Y}{\Delta G} = \frac{1-b}{1-b+j}$

b = MPC
j = MPM
b – j = slope of AE

Saving/Investment Approach – 1

We start with the equilibrium condition:

$$S + T + M = I + G + X \qquad (*)$$

Now, we need to find S.

Note that $Y = C + S + T$ (from Page 13)

$S = Y - C - T$; we substitute this back to (*)

$$Y - C - T + T + M = I + G + X$$

$$Y - C + M = 150$$

Saving/Investment Approach – 2

$Y – C + M = 150$

From $C = 300 + 0.75(Y – T)$ and $M = 100 + 0.25Y$,

we have

$Y – 300 – 0.75(Y – 50) + 100 + 0.25Y = 150$

$Y – 0.75Y + 0.25Y = 150 + 300 – 100 – 0.75(50)$

$0.5Y = 312.5$

$Y^* = 625$