SKM (Variable: Y)

Setup: $AS = Y$.
$AD = C + I + G$. } Definitional Identities.

$\Rightarrow C = \bar{c} + c' \cdot Y$, $\bar{c} > 0$, $0 < c' < 1$
$I = \bar{I}$ / $\bar{I} + iY$, $i > 0$.
$G = \bar{G}$ } Behavioral Equations.

Introducing Taxes (T)

↳ Lump sum Tax : $T = \bar{T}$
↳ Proportional Tax : $T = t \cdot Y$, $0 < t < 1$ (*).
↳ Partly lump sum, partly prop: $T = \bar{T} + t \cdot Y$, $\bar{T} > 0$, $0 < t < 1$

Post-tax consumption fn: $C = \bar{C} + c'(Y - T)$

Equillibrium: $Y = AD$.

$Y = C + I + G$.

$Y = \bar{C} + c'(Y - T) + \bar{I} + \bar{G}$

$Y = \bar{c} + c'(Y - t \cdot Y) + \bar{I} + \bar{G}$

$Y = \bar{c} + c'(1 - t) \cdot Y + \bar{I} + \bar{G}$

$[1 - c'(1-t)]\, Y = (\bar{c} + \bar{I} + \bar{G}) = \bar{A}$.

$$Y^* = \frac{\bar{A}}{1 - c'(1-t)}$$ .... Equi ouput in SKM.

Counter-Recessionary Macroeconomic policies:-

↳ Policies aimed at increasing GDP ($Y\uparrow$)

(i) Govt Expenditure Multiplier ($G\uparrow$)

How does increase in G impact Y. Compute dY

dG ✓

Equi: $Y = AD$

$Y = C + I + G$

$Y = \bar{C} + c'(Y - T) + \bar{I} + \bar{G}$

$Y = \bar{C} + c'(1-t)\cdot Y + \bar{I} + \bar{G}$ ...

Diff: $dY = 0 + c'(1-t)\cdot dY + 0 + dG$

$[1 - c'(1-t)]\cdot dY = dG$

$$\frac{dY}{dG} = \frac{1}{(1 - \underbrace{c'}_{>0}(\underbrace{1-t}_{>0}))} > 1$$ ... Govt exp. multiplier.

$(1-c'(1-t)) \rightarrow$ Frac

$\Rightarrow \frac{dY}{dG} > 1$ or $dY > dG \longrightarrow$ Multiplier Effect

(ii) Rate Cut Multiplier. ($t\downarrow$) ($dt < 0$)

Compute: $\frac{dY}{dt}$.

At equi: $Y = \bar{C} + c'(1-t)\cdot Y + \bar{I} + \bar{G}$

$[1 - c'(1-t)]\cdot Y = \bar{C} + \bar{I} + \bar{G}$

Diff: $[1 - c'(1-t)]\cdot dY + Y[-c'(-dt)] = 0$.

$$\frac{dY}{dt} = \frac{-c'Y}{1 - c'(1-t)} < 0$$ .... Rate cut multiplier

$$dY = \frac{-c'Y \underbrace{dt}_{<0}}{1 - c'(1-t)} > 0.$$

$$\left|\frac{dY}{dt}\right| = \frac{c'\cdot Y}{1 - c'(1-t)} > 1 \text{ if } \underbrace{c'\cdot Y}_{\text{need not be a fraction}} > \underbrace{[1 - c'(1-t)]}_{\text{fraction}}.$$

(iii) Balanced budget multiplier: ($G\uparrow$ $T\uparrow$ $\rightarrow dG = dT$)

(iii) Balanced budget multiplier: $(G\uparrow, T\uparrow \Rightarrow dG = dT)$

$$T = t \cdot Y$$

$$dT = t \cdot dY + Y \cdot dt = dG > 0$$

Find the impact on output for $\boxed{dG = dT > 0}$.

$$Y = C + I + G = \bar{C} + c'(Y - T) + \bar{I} + \bar{G}$$

Diff: $dY = c'(dY - dT) + dG$

$$(1-c')\, dY = -c' \cdot dT + dG$$

$$(1-c') \cdot dY = -c' \cdot dG + dG \quad [\because dG = dT]$$

$$\cancel{(1-c')} \cdot dY = \cancel{(1-c')} \cdot dG$$

$$\frac{dY}{dG} = 1 > 0 \quad \text{.... Balanced budget multiplier.}$$

$$dY = dG \text{ ....}$$

$\therefore$ Govt exp multiplier: $\frac{dY}{dG} = \frac{1}{1-c'(1-t)}$ > Rate cut multiplier $\left|\frac{dY}{dt}\right| = \frac{c' \cdot Y}{1-c'(1-t)}$ > BB multiplier $\frac{dY}{dG} = 1$.

$\therefore$ Govt exp multiplier > BB Multiplier,

HW.

Q. Find the BB Multiplier for the following scenarios:-

Case I: $I = I(Y) = \bar{I} + i \cdot Y,\ i > 0$

$$AD = C + I + G$$

$$C = \bar{C} + c' \cdot (Y - T), \quad T = \bar{T}$$

$$G = \bar{G}$$

Case II: Open Economy SKM.

$$AD = C + I + G + X - M$$

$$C = \bar{C} + c'(Y - T), \quad T = \bar{T}$$

$$I = \bar{I}, \quad G = \bar{G}$$

$$X = \bar{X}, \quad M = \bar{M} + m \cdot Y, \quad m > 0$$