The Algebra of Demand Side Equilibrium

CHAPTER 12

Appendix
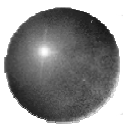
Demand-Side Equilibrium

To balance government budget, if both G and NT increase by $1, we get the following equality

$$Y^* = \frac{(a-b(NT+\$1)+I+G+\$1+X-M)}{1-b}$$

The difference between Y* and Y (the income level before changes in G or NT) is

Demand-Side Equilibrium

$$Y^* - Y = \frac{\$1(-b) + \$1}{1 - b}$$

Which can be simplified to

$$Y^* - Y = \frac{\$1(1 - b)}{1 - b} = \$1$$

Aggregate output increases by \$1 ➜ balanced budget multiplier equals 1

Demand-Side Equilibrium

✦ **Let**

  ▣ **ΔG: change in government purchases**

  ▣ **ΔNT: change in net taxes,**

  ▣ **the resulting change in aggregate output demanded ΔY is**

$$\Delta Y = \frac{(\Delta G - b\Delta NT)}{1 - b}$$

Proportional Income Tax

◈ **Consider a proportional income tax rate** *t*,   **0<=t<=1**

  ▣ Also called the *flat-rate tax*

◈ **Disposable income=**

$$Y - tY = (1 - t)Y$$

Proportional Income Tax

Plugged into the consumption function:

$$C = a + b(1-t)Y \Rightarrow$$

$$Y = a + b(1-t)Y + I + G + (X-M)$$

which yield

$$Y = \frac{a + I + G + (X-M)}{1 - b(1-t)}$$

Proportional Income Tax

- The spending multiplier with a proportional income tax equals

$$\frac{1}{1-b(1-t)}$$

- The higher the proportional tax rate, other things constant, the smaller the multiplier
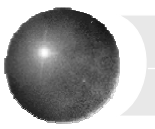
Variable Net Exports

- Variable net exports flatten the aggregate expenditure line,
  - Net exports decrease as real income increases
- Real GDP demanded with a proportional income tax and variable net exports is

$$Y = a + b(1-t)Y + I + G + X - m(1-t)Y$$

- Where $m(1-t)$ shows that imports are an increasing function of disposable income

◆ **This reduces to** $Y = \dfrac{(a+I+G+X)}{1-b+m+t(b-m)}$

◆ **The higher the proportional tax rate** t,   **or**

◆ **The higher the marginal propensity to import** m,

  the smaller the spending multiplier

             Remark: b>=m

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