

Principles of Macroeconomics

Topic 3 Part 4

Aggregate Expenditure and Equilibrium Output (CH 8)

Aggregate Expenditure and Aggregate Output

Three Versions of AE:

1. $AE = C + I$
2. $AE = C + I + G$
3. $AE = C + I + G + (X - M)$

We will now study the second and third versions altogether. In this version, we introduce the public sector and foreign sector into our economy.

Aggregate Expenditure and Aggregate Output

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

Recall that

- G is Government Spending.
- X is Export.
- M is Import.

We need to look at each of these new components.

The Government and Fiscal Policy

- In macroeconomics, the policy instruments are fiscal policy and monetary policy.
- **fiscal policy** The government's spending and taxing policies.
 - The Keynesian Cross focuses on Fiscal Policy.
- **monetary policy** The behavior of the Federal Reserve concerning the nation's money supply.
 - We will study this after the mid term.

Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d)

- **Government Spending** (G) is determined by the decision of the cabinet, which is a subjective judgment.
- Therefore, we assume that the government spending is “exogenous” or is given.
- That is, $G = \text{some constant}$, e.g. $G = 100$.
- To finance its spending, the government has to tax people.

Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d)

- **net “lump-sum” taxes (T)** Taxes paid by firms and households to the government minus transfer payments made to households by the government.
- **disposable, or after-tax, income (Y_d)** Total income minus net taxes: $Y - T$.

disposable income $\equiv$ total income – net taxes

$$Y_d \equiv Y - T$$

Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d)

Adding Taxes to the Consumption Function

- To modify our aggregate consumption function to incorporate disposable income:

$$C = a + bY_d$$

Or:

$$C = a + b(Y - T)$$

- The consumption function now depends on **Disposable Income** instead of before-tax income.

Government Purchases (G), Net Taxes (T), and Disposable Income (Y_d)

- When the revenue of the government is equal to its expenditure, that is $T = G$,
 - the government is said to run a “**balanced budget**”.
- For $T < G$ or alternatively $G - T > 0$,
 - the government runs a “**budget deficit**”.
- For $T > G$ or alternatively, $T - G > 0$,
 - the government runs a “**budget surplus**”.

Some Remarks

- When calculating GDP, transfer payment will not be included in GDP because there is NO new production.
- This is the same in this Keynesian Cross Model. Transfer payment is not included in G.
- Here, transfer payment is considered “negative taxes”.
- T denotes **“net taxes = taxes – transfer payment”**.

Export (X) and Import (M)

- **Export (X)** depends on the demand from other countries, and hence is not determined by the domestic economy.
- Thus, we assume that export is “exogenous” or is given.
- That is, $X = \text{some constant}$, e.g. $X = 100$.

Export (X) and Import (M)

- **Import (M)**, however, depends on the domestic economy.
- As people becomes richer, they import more.
- Thus, we assume that import is “endogenous” and depends on Y . That is, $M = M_0 + M_1(Y)$, where
 - M_0 is the autonomous import OR import when $Y = 0$.
 - M_1 is the marginal propensity to import (MPM) and $0 < \text{MPM} < 1$.

Export (X) and Import (M)

- When Import is equal to Export, $M = X$, the country has a “**trade balance**”.
- When Import is less than Export, $M < X$, the country has a “**trade surplus**”.
- When Import is more than Export, $M > X$, the country has a “**trade deficit**”.

The Determination of Equilibrium Output

Equilibrium Condition: $Y = AE$

(we produce what is demanded)

Demand: $AE = C + I + G + X - M$

To find the equilibrium Y^* , we solve

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

The Determination of Equilibrium Output

Example Find the equilibrium output Y^* .

$$C = 300 + 0.75(Y_d) \quad I = 50$$

$$G = 50 \quad T = 50 \quad X = 50 \quad M = 100 + 0.25Y$$

The Determination of Equilibrium Output

Example Find the equilibrium output Y^* with higher G .

$$C = 300 + 0.75(Y_d) \quad I = 50$$

$$G = 100 \quad T = 50 \quad X = 50 \quad M = 100 + 0.25Y$$

The Determination of Equilibrium Output

Example Find the equilibrium output Y^* with higher T .

$$C = 300 + 0.75(Y_d) \quad I = 50$$

$$G = 50 \quad T = 100 \quad X = 50 \quad M = 100 + 0.25Y$$

The Multipliers

- **multiplier** The ratio of the change in the equilibrium level of output to a change in some exogenous variable.
- Multiplier = $\Delta Y / \Delta \text{Exogenous Variable}$
- Exogenous Variables: Autonomous Investment, Autonomous Consumption, Tax, Government Spending, Export, Import, and so on.

Deriving the Multipliers

- Recall that $\text{Multiplier} = \Delta Y / \Delta \text{Exogenous Variable}$.
- Let's derive
 - the “investment multiplier” or $\Delta Y / \Delta I$
 - the “government multiplier” or $\Delta Y / \Delta G$
 - the “tax multiplier” or $\Delta Y / \Delta T$.
- At the equilibrium, we have $Y = AE = C + I + G + X - M$.
- Once again, **we leave I, G, T, and X as “variables”** since we need to find the derivatives of Y w.r.t. these variables

Deriving the Multipliers

- We have $Y = AE = C + I + G + X - M$.
 - $C = C_0 + C_1(Y - T)$ $M = M_0 + M_1(Y)$

The Multipliers

Interpretation