Topics for Today

1.) Summary

2.) Goods Market Equilibrium
   - DD Curve

3.) The Marshall-Lerner Condition

4.) Asset Market Equilibrium
   - AA Curve

5.) General Equilibrium in the Short-Run
Summary So Far

Goal: Develop a Model to Explain:
\[(E, Y, R, P)\]
As functions of:
- Govt. Policy (Monetary & Fiscal)
- Foreign Variables \((Y^*, R^*)\)

1.) FX MKt. Equil.
\[R = R^* + \frac{E^e - E}{E} \]
\[E \text{ given } R, E^e\]

2.) Money MKt. Equil.
\[\frac{M}{P} = L(Y, R) \]
\[R \text{ given } P, Y\]

3.) Purchasing Power Parity
\[E = \frac{P}{P^*} = \frac{M}{M^*} \cdot \frac{L(Y^*, R^*)}{L(Y, R)} \]
\[P \text{ and } E^e \text{ given } Y\]

What About \(Y\) ?!
The DD-AA Model

Goal: Derive 2 relationships between E and Y that jointly determine overall macroeconomic equilibrium in open-economies, with all endogenous variables allowed to adjust (Y, R, E, and P in the LR).

DD-Curve: Combinations of E and Y consistent with goods mkt. equil.
Aggregate Demand = Aggregate Supply

AA-Curve: Combinations of E and Y consistent with asset mkt. equil.
(both fx and money mkt.)
Aggregate Demand

\[ D(Y-T, \frac{EP^*}{p}) = C(Y-T) + I + G + CA(Y-T, \frac{EP^*}{p}) \]

Note, for simplicity \( I, G, T, P^* \) are assumed exogenous.

Also, \( P \) is assumed fixed in the short run.

1.) How does disposable income, \( Y^d = Y-T \), affect \( D \)?

- \( Y^d \uparrow \Rightarrow C \uparrow \) (positive "marginal propensity to consume"

- \( Y^d \uparrow \Rightarrow CA \downarrow \) (imports \( \uparrow \))

However, since imports are only part of overall consumption, we know \( C \uparrow \) more than \( CA \downarrow \), so overall \( Y^d \uparrow \Rightarrow D \uparrow \)
2.) How does $E$ affect $D$?

$$\text{CA} = X(g) - q \cdot M(g)$$

Net Exports measured in terms of domestic goods

Note, $q \uparrow \Rightarrow x \uparrow$

$q \uparrow \Rightarrow M \downarrow$

Dilemma: what happens to $q \cdot M(g)$ when $q$ changes?

It depends on whether $M$ falls more than $q$ rises, i.e., it depends on the sensitivity (or elasticity) of imports and exports with respect to changes in the real ex. rate.
Marshall-Lerner Condition

\[ CA = x(q) - q \cdot M(q) \]

\[ \frac{dCA}{dq} = \frac{dx}{dq} - M - q \frac{dM}{dq} \]

\[ = \frac{\Delta}{q} \left( \frac{\partial x}{\partial q} \right) - M - M \left( \frac{\partial M}{\partial q} \right) \]

Note:
\[ \eta^* = - \frac{\partial x}{\partial q} = \text{elasticity of foreign import demand} \]
\[ \eta = - \frac{\partial M}{\partial q} = \text{elasticity of domestic import demand} \]

Also, if trade is initially balanced, \( \frac{x}{q} = M \) so that we have:

\[ \frac{dCA}{dq} = M \left( \eta^* + \eta - 1 \right) \]

Marshall-Lerner Condition

If \( \eta^* + \eta > 1 \) then ex. rate depreciation "improves" the Current Account
Goods Market Equil:

\[ Y = D(Y, E) \]

Demand

\[ D = Y \]

\[ D(Y, E) \]

Excess Demand

Excess Supply

Aggregate Supply

Aggregate Demand
Note: DD is flatter when cA is more sensitive to ex. rate changes.
Shifts in the DD Curve

1. Expansionary Fiscal Policy \((G^\uparrow, T^\downarrow)\)

\[G_2 > G_1\]
Increase in the Domestic Price Level (P↑)

General Rule: Disturbances that increase Aggregate Demand shift DD to the right.
Disturbances that decrease Aggregate Demand shift DD to the left.
AA - Curve

\[ R + \frac{E_e - E}{E} \]

\[ Y_2 > Y_1 \]

AA steeper when x is more sensitive to Y and less sensitive to R.
Shifts in the AA-Curve

1. Expansionary Monetary Policy (MT)

Expansionary Monetary Policy Shifts AA up
2. An increase in the Domestic Price Level ($P_t$)

An increase in the Price Level shifts $AA$ down.
An expected depreciation shifts AA up
(E₁, Y₁) is the only exchange rate output combination consistent with equilibrium in both the goods market and the asset markets.