(II) THE MUNDELL-FLEMING MODEL

LECTURE 3:
THE MODEL WITH A FIXED EXCHANGE RATE

Keynesian Model of the trade balance $TB$ & income $Y$.

- Key assumption: $P$ fixed $\Rightarrow Y \neq \bar{Y}$.

Mundell-Fleming model

Key additional assumption:
international capital flows $KA$ respond to interest rates $i$.

Questions:

Effect of monetary expansion.

Effect of fiscal expansion or other increase in demand $\Delta \bar{A}$.
Recall the Keynesian model of the trade balance

\[ TB \text{ is a function of the exchange rate & income:} \]
\[ TB = \bar{X}(E) - mY. \]

We now embody \( E \) effects (whether via exports or imports) in \( \bar{X}; \)

and we assume the Marshall-Lerner condition holds: \( \frac{d\bar{X}}{dE} > 0. \)
Determination of income

Aggregate output = Aggregate Demand + net foreign demand:

\[ Y = A(i, Y) + TB(E, Y) \]

where \( \frac{dA}{di} < 0 \) and \( \frac{dA}{dY} > 0 \).

More specifically, let \( A(i, Y) = \bar{A} - b(i) + cY \),
where the function \(-b(\ )\) captures the negative effect of the interest rate \( i \) on investment spending, consumer durables, etc.

Combining equations,

\[ Y = A(i, Y) + TB(E, Y) = \bar{A} - b(i) + cY + \bar{X}(E) - mY. \]

Now solve to get the IS curve:

\[ Y = \frac{\bar{A} - b(i) + \bar{X}(E)}{s+m} \]

where \( s \equiv 1-c \) is the marginal propensity to save.
IS curve: An inverse relationship between $i$ and $Y$ consistent with supply = demand in the goods market.

\[
\text{IS: } Y = \frac{\bar{A} - b(i) + \bar{X}}{s+m}
\]

An increase in spending, $\bar{A}$, e.g., a fiscal expansion, shifts IS to the right by the multiplier $1/(s+m)$.

An decrease in $i$, (monetary expansion) stimulates $\bar{A}$ & so $Y$. 
The LM curve: Money supply = money demand.

\[
\frac{\overline{M1}}{\overline{P}} = L(i, Y) \quad \text{where } \frac{dL}{di} < 0, \quad \frac{dL}{dY} > 0.
\]

A monetary expansion \((M1 \uparrow)\) shifts the LM curve to the right.

- Do central banks actually set the money supply?
  - Their policy was to set M1 in the 1980s, the heyday of monetarism.
  - Also the monetary base made a comeback after 2008: Quantitative Easing.
The Mundell-Fleming equations with a fixed exchange rate

\[ IS: \quad Y = \frac{\bar{A} - b(i) + \bar{X}}{s+m} \]

\[ LM: \quad \frac{\bar{M}_1}{\bar{P}} = L(i, Y) \]
Monetary expansion in the Mundell-Fleming model: $M1 \uparrow$

**IS:** $Y = \frac{\bar{A} - b(i) + \bar{X}}{s + m}$

**LM:** $\frac{M1}{P} = L(i, Y)$

Or think of the central bank setting $i$ directly.

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Spending expansion in the Mundell-Fleming model: $\bar{A} \uparrow$

**IS:** \[ Y = \frac{\bar{A} - bi + \bar{X}}{s+m} \]

**LM:** \[ \frac{M1}{P} = L(i, Y) \]

Or the central bank may follow a Taylor Rule: setting $i$ systematically in response to $Y$ & inflation.
The Mundell-Fleming model introduces capital flows

\[ BP \equiv TB + KA \]

\[ TB = \bar{X} - mY \]

\[ BP=0: \quad \bar{X} - mY + \bar{KA} + \kappa (i-i^*) = 0 \]

New addition: capital flows respond to interest rate differential

\[ KA = \bar{KA} + \kappa (i-i^*) \]

where \( \kappa \equiv \frac{d(KA)}{d(i-i^*)} \), capital mobility.

We want to graph \( BP = 0 \).

Solve for interest differential:

\[ (i-i^*) = \left( \frac{1}{\kappa} \right) [ -\bar{KA} - \bar{X} ] + \left( \frac{m}{\kappa} \right) Y. \]
\[ BP = 0: \quad (i-i^*) = \left( \frac{1}{\kappa} \right) \left[ (-KA - (\bar{X} - \bar{M})) \right] + \left( \frac{m}{\kappa} \right) Y. \]

The slope is \((m/\kappa)\).

\[ \kappa = 0 \]
\[ \kappa > 0 \]
\[ \kappa \gg 0 \]

Capital mobility gives some slope to the \(BP=0\) line.

A rise in income and the trade deficit is consistent with \(BP=0\) ...

*if* higher interest rates attract a big enough capital inflow.
Application: Why did many developing countries find themselves with BoP surpluses during 2003-08 & 2010-13?

- Strong economic performance (especially Asia) -- IS shifts right.
- Easy monetary policy in US and other major industrialized countries (low $i^*$) -- BP shifts down.
- Boom in mineral & agricultural commodities (esp. Africa & Latin America) -- BP shifts right.
Causes of BoP Surpluses in Developing Countries

I. “Pull” Factors (internal causes)

1. Monetary stabilization => LM shifts up
2. Removal of capital controls => $\kappa$ rises
3. Spending boom => IS shifts out/up

II. “Push” Factors (external causes)

1. Low interest rates in rich countries => $i^*$ down => BP shifts out/down
2. Boom in export markets =>

\[ \text{Diagram}: \quad IS \quad \text{LM} \]

$BP_{surplus}$ $BP=0$
END OF LECTURE 3:
THE MUNDELL-FLEMING MODEL
WITH A FIXED EXCHANGE RATE