The IS-LM Model

• One of the most pragmatic and widely used models
• Highly criticized from a theoretical point of view
• Gives useful insights for short term decisions on fiscal and monetary policy as well as exchange rates and Balance of Payments
The IS-LM Curve

There is only one set of Income (Y) and Interest Rate (i) that results in an equilibrium of both markets.
The IS curve in a closed economy

IS stands for Investment = Savings
Assume that Income is either consumed (C), Saved (S) or paid as taxes (T):
\[ Y = C + S + T \]
And that Aggregate demand equals Income:
\[ Y = C + G + I \]
(for a large, closed economy)
Then:
\[ I = S + (T - G) \]
The IS curve shows all the points where Investment and savings (private and government) are in equilibrium.
The LM Curve

• Assume that every person can either hold cash or invest in interest bearing securities.

• Then the demand for money (L) is a function of income (Y) and interest rates (i).

• The Supply of money (M) is set by the Central Bank and is considered to be constant, as well as the level of prices (P).
Changes in the curves

Shifts of the IS or LM curves can be done through movements other than $i$ and $Y$. For example through fiscal or monetary policy or changes in the consumption level.
IS-LM in an Open Economy

Two factors are added, Capital Mobility (M-X) and Exchange Rates.

$I = S$ holds:

$$S = \{(1-t)Y-C\} + \{tY-G\} + (M-X) = I$$

Savings equal Consumer Savings, Government Savings and external savings. A positive current account means that nationals are saving abroad, a current account deficit means that foreigners are saving in the economy.
The effect of exchange rate is dependent on size of economy

Example: Depreciation of exchange rate

Large, open economy:
- Products of the country become cheaper
- Increasing demand for goods, output increases
- IS curve shifts out (supply of money stays constant)
- Y and i increase

Small, open economy:
- Initially the same effects
- Due to a higher i compared to the rest of the world capital inflow increases
- Currency appreciates and i shifts back, moving the IS curve down
Large Open Economy

- Expansionary fiscal policy => IS out => Y up and i up (1)
- Expansionary monetary policy => LM out => Y up and i down (2)
- Depreciation/devaluation => IS out => Y up and i up (1)
Interest Rate in Small Open Economy

Interest rates must equal world rate \((i_f)\) + country risk \((\alpha)\)
Small Open Economy with Flexible ER

- **Expansionary Monetary Policy:** Very Effective
  LM out $\Rightarrow$ Y up and i down (1) $\Rightarrow$ $i < (i+ \alpha)$ $\Rightarrow$ money outflow $\Rightarrow$ depreciation $\Rightarrow$ X up and M down $\Rightarrow$ IS out $\Rightarrow$ Y up and i up (2)
Small Open Economy with Flexible ER

- Expansionary fiscal policy: **Not effective**
  IS out => Y up and i up (1) => i > (i + α) => money inflow => ER appreciates => X down and M up => trade deficit => IS in (2)
Small Open Economy with Fixed ER

- Expansionary monetary policy: Not effective

LM out $\Rightarrow$ Y up and i down (1) $\Rightarrow$ $i < (i + \alpha)$ $\Rightarrow$ reserve outflow (BOP deficit) $\Rightarrow$ Money Supply down $\Rightarrow$ LM in (2)
Small Open Economy with Fixed ER

- Expansionary fiscal policy: very effective
  IS out => Y up and i up (1) => i > (i + α) => reserve inflow (BOP surplus) => Money Supply up => LM out (2)
Closed Economy with any ER

• Expansionary fiscal policy => IS out => Y up and i up (1)
• Expansionary monetary policy => LM out => Y up and i down (2)
• Depreciation/devaluation => IS out => Y up and i up (1)

Similar to large open economy!
Changes in country risk ($\alpha$)

Small open economy with flexible ER:

$\alpha$ up so $(i + \alpha)$ up (1) $\Rightarrow$ $i < (i + \alpha)$ $\Rightarrow$ money outflow $\Rightarrow$ ER depreciates $\Rightarrow$ $X$ up and $M$ down $\Rightarrow$ trade surplus $\Rightarrow$ IS out (2)
Changes in country risk ($\alpha$)

Small open economy with fixed ER:
$\alpha$ up so $(i+ \alpha)$ up (1) $\Rightarrow$ $i < (i+ \alpha)$ $\Rightarrow$ reserve outflow (BOP deficit) $\Rightarrow$ Money supply down $\Rightarrow$ LM in

![Graph showing IS and LM curves with points (1) and (2)]
## Summary

<table>
<thead>
<tr>
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