Topics to be covered…

• Effects of temporary and permanent changes in monetary and fiscal policies.
• Adjustment of the current account over time.

Temporary Changes in Monetary Policy

• Monetary policy: policy in which the central bank influences the supply of monetary assets.
  • Monetary policy is assumed to affect asset markets first.
• Fiscal policy: policy in which governments (fiscal authorities) influence the amount of government purchases and taxes.
  • Fiscal policy is assumed to affect aggregate demand and output first.
• Temporary policy changes are expected to be reversed in the near future and thus do not affect expectations about exchange rates in the long run.

Temporary Changes in Fiscal Policy

• An increase in government purchases or a decrease in taxes increases aggregate demand and output in the short run.
  • The DD curve shifts right.
  • Higher output increases demand of real monetary assets,
  • thereby increasing interest rates,
  • causing the domestic currency to appreciate (a fall in $S$).

Effects of a Temporary Increase in the Money Supply

An increase in the quantity of monetary assets supplied lowers interest rates in the short run, causing the domestic currency to depreciate (a rise in $S$).

The AA shifts up (right).
Domestic products relative to foreign products are cheaper so that aggregate demand and output increase until a new short run equilibrium is achieved.

Temporary Changes in Monetary Policy

• An increase in the quantity of monetary assets supplied lowers interest rates in the short run, causing the domestic currency to depreciate (a rise in $S$).
  • The AA shifts up (right).
  • Domestic products relative to foreign products are cheaper so that aggregate demand and output increase until a new short run equilibrium is achieved.

Temporary Changes in Fiscal Policy

• An increase in government purchases or a decrease in taxes increases aggregate demand and output in the short run.
  • The DD curve shifts right.
  • Higher output increases demand of real monetary assets,
  • thereby increasing interest rates,
  • causing the domestic currency to appreciate (a fall in $S$).
Effects of a Temporary Fiscal Expansion

Recent Temporary Stimulus Packages

Table 2: Fiscal Stimulus Packages Announced for 2008-09 on or January 17, 2009

<table>
<thead>
<tr>
<th>Country</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>2.9%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Euro area</td>
<td>4.5%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Japan</td>
<td>9.2%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Fiscal Expansions (percent GDP, change with respect to pre-crisis year 2007)

<table>
<thead>
<tr>
<th>Country</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>-1.8%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Australia</td>
<td>-0.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Brazil</td>
<td>-0.8%</td>
<td>0.1%</td>
</tr>
<tr>
<td>China</td>
<td>-0.8%</td>
<td>0.1%</td>
</tr>
<tr>
<td>France</td>
<td>-0.8%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Germany</td>
<td>-0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>India</td>
<td>-0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>-0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Korea</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Russia</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>South Korea</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>United States</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Growth Effects of Fiscal Stimulus (deviation from baseline in percentage points)

WEO Global Growth Projections (with and without estimated G-20 Fiscal Stimulus)

WEO Global Growth Projections (with and without estimated G-20 Fiscal Stimulus)
Policies to Maintain Full Employment

- Resources used in the production process can either be over-employed or underemployed.
- When resources are used effectively and sustainably, economists say that production is at its potential or natural level.
  - When resources are not used effectively, resources are underemployed: high unemployment, few hours worked, idle equipment, lower than normal production of goods and services.
  - When resources are not used sustainably, labor is over-employed: low unemployment, many overtime hours, over-utilized equipment, higher than normal production of goods and services.

Maintaining Full Employment After a Temporary Fall in World Demand for Domestic Products

Temporary fiscal policy could reverse the fall in aggregate demand and output.

Temporary fall in world demand for domestic products reduces output below its normal level.

Temporary monetary expansion could depreciate the domestic currency.

Policies to Maintain Full Employment After a Money Demand Increase

Temporary monetary policy could increase money supply to match money demand.

Increase in money demand raises interest rates and appreciates the domestic currency.

Temporary fiscal policy could increase aggregate demand and output.

Policies to Maintain Full Employment (cont.)

- Policies to maintain full employment may seem easy in theory, but are hard in practice.
  1. We have assumed that prices and expectations do not change, but people may anticipate the effects of policy changes and modify their behavior.
     - Workers may require higher wages if they expect overtime and easy employment, and producers may raise prices if they expect high wages and strong demand due to monetary and fiscal policies.
     - Fiscal and monetary policies may therefore create price changes and inflation thereby preventing high output and employment: inflationary bias.
Policies to Maintain Full Employment (cont.)

2. Economic data are difficult to measure and to understand.
   • Policy makers can not interpret data about asset markets and aggregate demand with certainty, and sometimes they make mistakes.
3. Changes in policies take time to be implemented and to affect the economy.
   • Because they are slow, policies may affect the economy after the effects of an economic change have dissipated.
4. Policies are sometimes influenced by political or bureaucratic interests.

Permanent Changes in Monetary Policy

• A permanent increase in the quantity of monetary assets supplied
  • lowers interest rates in the short run and makes people expect future depreciation of the domestic currency, increasing the expected rate of return on foreign currency deposits.
  • The domestic currency depreciates more than (S rises more than) the case when expectations are constant.
  • The AA curve shifts up (right) more than the case when expectations are held constant.

Effects of Permanent Changes in Monetary Policy in the Long Run

• With employment and hours above their normal levels, there is a tendency for wages to rise over time.
• With strong demand of goods and services and with increasing wages, producers have an incentive to raise prices over time.
• Both higher wages and higher output prices are reflected in a higher level of average prices.
• What are the effects of rising prices?

Permanent Changes in Monetary and Fiscal Policy

• "Permanent" policy changes are those that are assumed to modify people’s expectations about exchange rates in the long run.

Short-Run Effects of a Permanent Increase in the Money Supply

A permanent increase in the money supply decreases interest rates and causes people to expect a future depreciation, leading to a large actual depreciation.

Long-Run Adjustment to a Permanent Increase in the Money Supply

In the long run, output returns to its normal level, and we also see overshooting E1 < E3 < E2.

Higher prices make domestic products more expensive relative to foreign goods, reducing in aggregate demand.

Higher prices reduce real money supply, increasing interest rates, leading to a domestic currency appreciation.
Effects of Permanent Changes in Fiscal Policy

• A permanent increase in government purchases or reduction in taxes
  • increases aggregate demand
  • makes people expect the domestic currency to appreciate in the short run due to increased aggregate demand, thereby reducing the expected rate of return on foreign currency deposits and making the domestic currency appreciate.
  • The first effect increases aggregate demand of domestic products, the second effect decreases aggregate demand of domestic products (by making them more expensive).

Effects of Permanent Changes in Fiscal Policy (cont.)

• If the change in fiscal policy is expected to be permanent, the first and second effects exactly offset each other, so that output remains at its potential or natural (or long run) level.
• We say that an increase in government purchases completely crowds out net exports, due to the effect of the appreciated domestic currency.

U.S. Federal Outlays as a Percentage of GDP

• Average over the past half century: 20.2%
• In 2007, the year before the crisis: 20%
• In 2009, from the Obama budget: 27.2%
• Average 2010-19, in Obama budget: 22.6%
• In 2019, last year of Obama budget: 22.6%

IMF Estimates of Crowding Out Effects

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage Decrease in Government Spending</th>
<th>Baseline Estimate of Government Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>-0.1</td>
<td>-0.1</td>
</tr>
<tr>
<td>Europe</td>
<td>-0.1</td>
<td>-0.1</td>
</tr>
<tr>
<td>US</td>
<td>-0.1</td>
<td>-0.1</td>
</tr>
</tbody>
</table>


U.S. Top Tax Rates

Top Tax Rates, 1900 to present

100  80  60  40  20  0  80  60  40  20  0

Gain

Rate
Effects of a Permanent Fiscal Expansion

An increase in government purchases raises aggregate demand.

Temporary fiscal expansion outcome

When the increase of government purchases is permanent, the domestic currency is expected to appreciate, and does appreciate.

Macroeconomic Policies and the Current Account

- To determine the effect of monetary and fiscal policies on the current account,
  - derive the XX curve to represent the combinations of output and exchange rates at which the current account is at its desired level.
  - As income from production increases, imports increase and the current account decreases when other factors remain constant.
  - To keep the current account at its desired level, the domestic currency must depreciate as income from production increases: the XX curve should slope upward.

How Macroeconomic Policies Affect the Current Account

- As domestic income and production increase, the domestic currency must depreciate to entice foreigners to increase their demand of domestic products in order to keep the current account (only one component of aggregate demand) at its desired level—on the XX curve.
- As domestic income and production increase, the domestic currency must depreciate more rapidly to entice foreigners to increase their demand of domestic products in order to keep aggregate demand (by domestic residents and foreigners) equal to production—on the DD curve.

Macroeconomic Policies and the Current Account (cont.)

- Policies affect the current account through their influence on the value of the domestic currency.
  - An increase in the quantity of monetary assets supplied depreciates the domestic currency and often increases the current account in the short run.
  - An increase in government purchases or decrease in taxes appreciates the domestic currency and often decreases the current account in the short run.
How Macroeconomic Policies Affect the Current Account

An increase in the money supply shifts up the AA curve and depreciates the domestic currency, increasing the current account above XX.

A temporary fiscal expansion shifts the DD and appreciates the domestic currency, decreasing the CA below XX.

Because the AA curve also shifts, a permanent fiscal expansion decreases the CA more.

Value Effect, Volume Effect and the J-curve

- If the volume of imports and exports is fixed in the short run, a depreciation of the domestic currency
  - will not affect the volume of imports or exports,
  - but will increase the value/price of imports in domestic currency and decrease the current account: \( CA = EX - IM \).
  - The value of exports in domestic currency does not change.
  - The current account could immediately decrease after a currency depreciation, then increase gradually as the volume effect begins to dominate the value effect.

- In the DD-AA model, the pass through rate is 100%:
  - import prices in domestic currency exactly match a depreciation of the domestic currency.
- In reality, pass through may be less than 100% due to price discrimination in different countries.
  - Firms that set prices may decide not to match changes in the exchange rate with changes in prices of foreign products denominated in domestic currency.

- If prices of foreign products in domestic currency do not change much because of a pass through rate less than 100%, then the
  - value of imports will not rise much after a domestic currency depreciation, and the current account will not fall much, making the J-curve effect smaller.
  - volume of imports and exports will not adjust much over time since domestic currency prices do not change much.
  - Pass through of less than 100% dampens the effect of depreciation or appreciation on the current account.

IS-LM Model

- In the DD-AA model, we assumed that investment expenditure is determined by exogenous business decisions.
- In reality, the amount of investment expenditure depends on the interest rate.
  - Investment projects use saved or borrowed funds, and the relevant interest rate represents the (real) cost of spending or borrowing those funds.
  - A higher interest rate means less investment expenditure.
- The IS-LM model predicts that investment expenditure is inversely related to the relevant interest rate.
The IS-LM model also allows for consumption expenditure and expenditure on imports to depend on the interest rate. A higher interest rate makes saving more attractive and consumption expenditure (on domestic and foreign products) less attractive. However, the effect of the interest rate is much larger on investment expenditure than it is on consumption expenditure and imports.

The IS-LM model expresses aggregate demand as:

\[ D = C(Y - T, R - \pi e) + I(R - \pi e) + G + CA(Ee/P, Y - T, R - \pi e) \]

\[ \text{Investment as a function of the real interest rate} \]
\[ \text{Current account as a function of the real exchange rate, disposable income and the real interest rate} \]

\[ \text{Consumption as a function of disposable income and the real interest rate} \]
\[ \text{Government purchases are exogenous} \]

In equilibrium, aggregate output = aggregate demand:

\[ Y = D(EeP/P(1+R-R^*), Y - T, R - \pi e, G) \]

Lower interest rates increase investment demand (and consumption and import demand), leading to higher aggregate demand and higher aggregate output in equilibrium. The IS curve slopes down.

Instead of relating exchange rates and output, the IS-LM relates interest rates and output. In equilibrium, aggregate output = aggregate demand:

\[ Y = D(EeP/P, Y - T, R - \pi e, G) \]

\[ \text{This equation describes the IS curve: combinations of interest rates and output such that aggregate demand equals aggregate output, given values of exogenous variables} E^e, P^*, P, R^*, T, \pi^e, \text{and } G. \]

Higher income is predicted to cause higher demand of real monetary assets and higher interest rates in the money market. The IS curve slopes down.

In equilibrium, the quantity of real monetary assets supplied matches the quantity of real monetary assets demanded: \[ M/P = L(R, Y) \]

\[ \text{This equation describes the LM curve: combinations of interest rates and output such that the money market is in equilibrium, given values of exogenous values } P \text{ and } M^e. \]

Higher income is predicted to cause higher demand of real monetary assets and higher interest rates in the money market. The LM curve slopes up.

In equilibrium, the quantity of real monetary assets supplied matches the quantity of real monetary assets demanded: \[ M/P = L(R, Y) \]

\[ \text{This equation describes the LM curve: combinations of interest rates and output such that the money market is in equilibrium, given values of exogenous values } P \text{ and } M^e. \]

Higher income is predicted to cause higher demand of real monetary assets and higher interest rates in the money market. The LM curve slopes up.

In equilibrium, interest parity holds:

\[ R = R^* + (Ee - E)/E \]
\[ E(1+R) = ER^* + Ee \]
\[ E(1+R-R^*) = Ee \]
\[ E = Ee/(1+R-R^*) \]

\[ \text{Higher income is predicted to cause higher demand of real monetary assets and higher interest rates in the money market. The LM curve slopes up.} \]
Effects of Temporary Changes in the Money Supply (cont.)

Expected return on foreign currency deposits

Temporary increase in money supply

Interest rate, $R$

LM

Expected return on foreign currency deposits

Effects of Permanent Changes in the Money Supply in the Short Run

Expected return on foreign currency deposits

Permanent increase in money supply

Exchange rate, $E$

LM

Expected return on foreign currency deposits

Effects of Temporary Changes in Fiscal Policy

Expected return on foreign currency deposits

Temporary fiscal expansion

Exchange rate, $E$

LM

Expected return on foreign currency deposits

Effects of Permanent Changes in Fiscal Policy

Expected return on foreign currency deposits

Permanent fiscal expansion

Exchange rate, $E$

LM

Expected return on foreign currency deposits