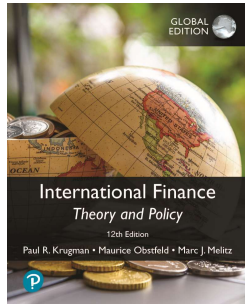


International Finance



Chapter 6

Output and the Exchange Rate in the Short Run

Learning Objectives (1 of 2)

6.1 Explain the role of the real exchange rate in determining the aggregate demand for a country's output.

6.2 See how an open economy's short-run equilibrium can be analyzed as the intersection of an asset market equilibrium schedule (*AA*) and an output market equilibrium schedule (*DD*).

6.3 Understand how monetary and fiscal policies affect the exchange rate and national output in the short run.

Learning Objectives (2 of 2)

6.4 Describe and interpret the long-run effects of permanent macroeconomic policy changes.

6.5 Explain the relationship among macroeconomic policies, the current account balance, and the exchange rate.

Preview

- Determinants of aggregate demand in the short run
- A short-run model of output markets
- A short-run model of asset markets
- A short-run model for both output markets and asset markets
- Effects of temporary and permanent changes in monetary and fiscal policies
- Adjustment of the current account over time
- **IS-LM** model

Introduction

- Long-run models are useful when all prices of inputs and outputs have time to adjust.
- In the short run, some prices of inputs and outputs may not have time to adjust, due to labor contracts, costs of adjustment, or imperfect information about willingness of customers to pay at different prices.
- This chapter builds on the short-run and long-run models of exchange rates to explain how output is related to exchange rates in the short run.
 - It shows how macroeconomic policies can affect production, employment, and the current account.

Determinants of Aggregate Demand (1 of 3)

- **Aggregate demand** is the aggregate amount of goods and services that individuals and institutions are willing to buy:
 1. consumption expenditure
 2. investment expenditure
 3. government purchases
 4. net expenditure by foreigners: the current account

Determinants of Aggregate Demand (2 of 3)

- Determinants of consumption expenditure include:
 - **Disposable income:** income from production (Y) minus taxes (T).
 - More disposable income means more consumption expenditure, but consumption typically increases less than the amount that disposable income increases.
 - Real interest rates may influence the amount of saving and spending on consumption goods, but we assume that they are relatively unimportant here.
 - Wealth may also influence consumption expenditure, but we assume that it is relatively unimportant here.

Determinants of Aggregate Demand (3 of 3)

- Determinants of the current account include:
 - **Real exchange rate:** prices of foreign products relative to the prices of domestic products, both measured in domestic currency: $\frac{WP^*}{P}$
 - As the prices of foreign products rise relative to those of domestic products, expenditure on domestic products rises, and expenditure on foreign products falls.
 - **Disposable income:** more disposable income means more expenditure on foreign products (imports).

Table 6.1 Factors Determining the Current Account

Change	Effect on Current Account, CA
Real exchange rate, $\frac{EP^*}{P} \uparrow$	CA \uparrow
Real exchange rate, $\frac{EP^*}{P} \downarrow$	CA \downarrow
Disposable income, $Y^d \uparrow$	CA \downarrow
Disposable income, $Y^d \downarrow$	CA \uparrow

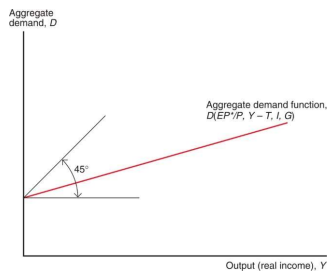
How Real Exchange Rate Changes Affect the Current Account (1 of 2)

- The current account measures the value of exports relative to the value of imports: $CA \approx EX - IM$.
 - When the real exchange rate $\frac{EP^*}{P}$ rises, the prices of foreign products rise relative to the prices of domestic products.
 - The **volume** of exports that are bought by foreigners rises.
 - The **volume** of imports that are bought by domestic residents falls.
 - The **value** of imports in terms of domestic products rises: the value/price of imports rises, since foreign products are more valuable/expensive.

How Real Exchange Rate Changes Affect the Current Account (2 of 2)

- If the volumes of imports and exports do not change much, the **value effect** may dominate the **volume effect** when the real exchange rate changes.
 - For example, contract obligations to buy fixed amounts of products may cause the volume effect to be small.
- However, evidence indicates that for most countries the volume effect dominates the value effect after 1 year or less.
- Let's assume for now that a real depreciation leads to an increase in the current account: the volume effect dominates the value effect.

Figure 6.1
Aggregate Demand as a Function of Output



Aggregate demand is a function of the real exchange rate $\frac{EP^*}{P}$, disposable income $(Y - T)$, investment demand (I) , and government spending (G) . If all other factors remain unchanged, a rise in output (real income), Y , increases aggregate demand. Because the increase in aggregate demand is less than the increase in output, the slope of the aggregate demand function is less than 1 (as indicated by its position within the 45-degree angle).

Determinants of Aggregate Demand (1 of 4)

- Determinants of the current account include:
 - **Real exchange rate:** an increase in the real exchange rate increases the current account.
 - **Disposable income:** an increase in the disposable income decreases the current account.

Determinants of Aggregate Demand (2 of 4)

- For simplicity, we assume that exogenous political factors determine government purchases G and the level of taxes T .
- For simplicity, we currently assume that investment expenditure I is determined by exogenous business decisions.
 - A more complicated model shows that investment depends on the cost of spending or borrowing to finance investment: the interest rate.

Determinants of Aggregate Demand (3 of 4)

- Aggregate demand is therefore expressed as:

$$D = C(Y - T) + I + G + CA\left(\frac{EP^*}{P}, Y - T\right)$$

- where $C(Y - T)$ is consumption expenditure as a function of disposable income,
 - $I + G$ is investment expenditure and government purchases (both exogenous), and
 - $CA\left(\frac{EP^*}{P}, Y - T\right)$ is the current account as a function of the real exchange rate and disposable income.
- Or more simply: $D = D\left(\frac{EP^*}{P}, Y - T, I, G\right)$

Determinants of Aggregate Demand (4 of 4)

- Determinants of aggregate demand include:
 - **Real exchange rate:** an increase in the real exchange rate increases the current account, and therefore increases aggregate demand of domestic products.
 - **Disposable income:** an increase in the disposable income increases consumption expenditure, but decreases the current account.
 - Since consumption expenditure is usually greater than expenditure on foreign products, the first effect dominates the second effect.
 - As income increases for a given level of taxes, aggregate consumption expenditure and aggregate demand increase by less than income.

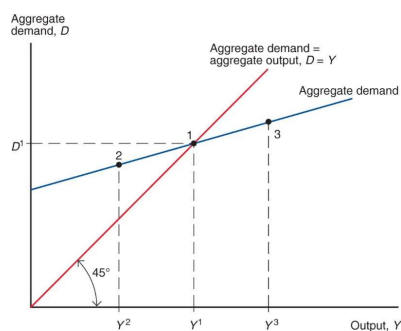
Short-Run Equilibrium for Aggregate Demand and Output

- Equilibrium is achieved when the value of output and income from production Y equals the value of aggregate demand D

$$Y = D\left(\frac{EP^*}{P}, Y - T, I, G\right)$$

- where aggregate demand is a function of the real exchange rate, disposable income, investment expenditure, and government purchases.

Figure 6.2 The Determination of Output in the Short Run

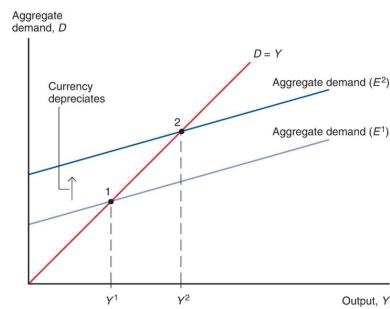


In the short run, output settles at Y^1 (point 1), where aggregate demand, D^1 , equals aggregate output, Y^1 .

Short-Run Equilibrium and the Exchange Rate: *DD* Schedule (1 of 2)

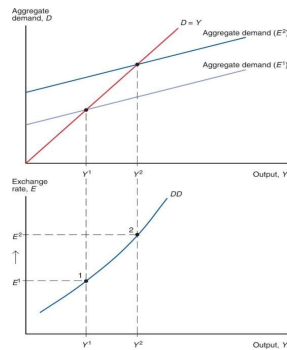
- How does the exchange rate affect the short-run equilibrium of aggregate demand and output?
- With fixed domestic and foreign levels of average prices, a rise in the nominal exchange rate makes foreign goods and services more expensive relative to domestic goods and services.
- A rise in the nominal exchange rate (a domestic currency depreciation) increases aggregate demand of domestic products.
- In equilibrium, production will increase to match the higher aggregate demand.

Figure 6.3
Output Effect
of a Currency
Depreciation
with Fixed
Output Prices



A rise in the exchange rate from E^1 to E^2 (a currency depreciation) raises aggregate demand to **Aggregate demand (E^2)** and output to Y^2 , all else equal.

Figure 6.4
Deriving
the *DD* Schedule



The *DD* schedule (shown in the lower panel) slopes upward because a rise in the exchange rate from E^1 to E^2 all else equal, causes output to rise from Y^1 to Y^2 .

Short-Run Equilibrium and the Exchange Rate: *DD* Schedule (2 of 2)

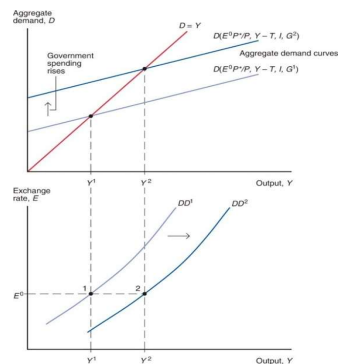
DD schedule

- shows combinations of output and the exchange rate at which the output market is in short-run equilibrium (such that aggregate demand = aggregate output).
- slopes upward because a rise in the exchange rate causes aggregate demand and aggregate output to rise.

Shifting the *DD* Curve (1 of 3)

- Changes in the exchange rate cause movements along a *DD* curve. Other changes cause it to shift:
1. **Changes in G :** more government purchases cause higher aggregate demand and output in equilibrium. Output increases for every exchange rate: the *DD* curve shifts right.
 2. **Changes in T :** lower taxes generally increase consumption expenditure, increasing aggregate demand and output in equilibrium for every exchange rate: the *DD* curve shifts right.

Figure 6.5
Government
Demand and the
Position of the
DD Schedule



A rise in government demand from G^1 to G^2 raises output at every level of the exchange rate. The change therefore shifts *DD* to the right.

Shifting the *DD* Curve (2 of 3)

3. **Changes in *I*:** higher investment expenditure shifts the *DD* curve right.
4. **Changes in *P*:** higher domestic prices make domestic output more expensive compared to foreign output and reduce net export demand, shifting the *DD* curve left.
5. **Changes in *P**:** higher foreign prices make domestic output less expensive compared to foreign output and increase net export demand, shifting the *DD* curve right.

Shifting the *DD* Curve (3 of 3)

6. **Changes in *C*:** willingness to consume more and save less shifts the *DD* curve right.
7. **Changes in demand of domestic goods relative to foreign goods:** willingness to consume more domestic goods relative to foreign goods shifts the *DD* curve right.

Short-Run Equilibrium in Asset Markets (1 of 2)

- Consider two sets of asset markets:

1. Foreign exchange markets

- interest parity represents equilibrium: $R = R^* + \frac{(E^e - E)}{E}$

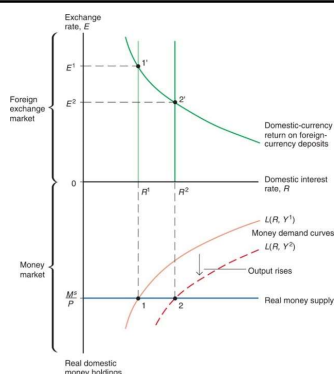
2. Money market

- Equilibrium occurs when the quantity of real monetary assets supplied matches the quantity of real monetary

assets demanded: $\frac{M^d}{P} = L(R, Y)$

- A rise in income from production causes the demand of real monetary assets to increase.

Figure 6.6
Output and the
Exchange Rate
in Asset Market
Equilibrium



For the asset (foreign exchange and money) markets to remain in equilibrium, a rise in output must be accompanied by an appreciation of the currency, all else equal.

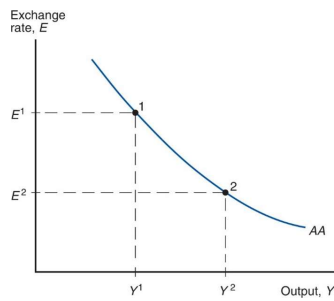
Short-Run Equilibrium in Asset Markets (2 of 2)

- When income and production increase,
 - demand of real monetary assets increases,
 - leading to an increase in domestic interest rates,
 - leading to an appreciation of the domestic currency.
- Recall that an appreciation of the domestic currency is represented by a fall in E .
- When income and production decrease, the domestic currency depreciates and E rises.

Short-Run Equilibrium in Asset Markets: AA Curve

- The inverse relationship between output and exchange rates needed to keep the foreign exchange markets and the money market in equilibrium is summarized as the AA curve.

Figure 6.7
The AA
Schedule



The asset market equilibrium schedule (AA) slopes downward because a rise in output from Y^1 to Y^2 , all else equal, causes a rise in the home interest rate and a domestic currency appreciation from E^1 to E^2 .

Shifting the AA Curve (1 of 3)

- Changes in M^s :** an increase in the money supply reduces interest rates in the short run, causing the domestic currency to depreciate (a rise in E) for every Y : the AA curve shifts up (right).
- Changes in P :** An increase in the level of average domestic prices decreases the supply of real monetary assets, increasing interest rates, causing the domestic currency to appreciate (a fall in E): the AA curve shifts down (left).

Shifting the AA Curve (2 of 3)

- Changes in E^e :** if market participants expect the domestic currency to depreciate in the future, foreign currency deposits become more attractive, causing the domestic currency to depreciate (a rise in E): the AA curve shifts up (right).
- Changes in R^* :** An increase in the foreign interest rates makes foreign currency deposits more attractive, leading to a depreciation of the domestic currency (a rise in E): the AA curve shifts up (right).

Shifting the AA Curve (3 of 3)

5. **Changes in the demand of real monetary assets:** if domestic residents are willing to hold a lower amount of real money assets and more non-monetary assets, interest rates on nonmonetary assets would fall, leading to a depreciation of the domestic currency (a rise in E): the AA curve shifts up (right).

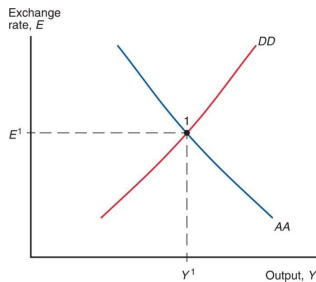
Putting the Pieces Together: the DD and AA Curves (1 of 2)

- A short-run equilibrium means a **nominal exchange rate** and level of **output** such that
 1. equilibrium in the output markets holds: aggregate demand equals aggregate output.
 2. equilibrium in the foreign exchange markets holds: interest parity holds.
 3. equilibrium in the money market holds: the quantity of real monetary assets supplied equals the quantity of real monetary assets demanded.

Putting the Pieces Together: the DD and AA Curves (2 of 2)

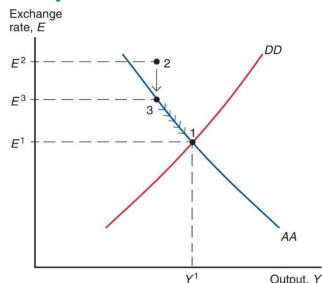
- A short-run equilibrium occurs at the intersection of the D and AA curves:
 - output markets are in equilibrium on the DD curve
 - asset markets are in equilibrium on the AA curve

Figure 6.8 Short-Run Equilibrium: The Intersection of DD and AA



The short-run equilibrium of the economy occurs at point 1, where the output market (whose equilibrium points are summarized by the DD curve) and the asset market (whose equilibrium points are summarized by the AA curve) simultaneously clear.

Figure 6.9 How the Economy Reaches Its Short-Run Equilibrium



Because asset markets adjust very quickly, the exchange rate jumps immediately from point 2 to point 3 on AA . The economy then moves to point 1 along AA as output rises to meet aggregate demand.

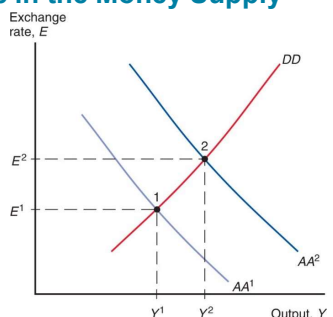
Temporary Changes in Monetary and Fiscal Policy

- **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 Monetary Policy

- An increase in the quantity of monetary assets supplied lowers interest rates in the short run, causing the domestic currency to depreciate (E rises).
 - 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.

Figure 6.10 Effects of a Temporary Increase in the Money Supply

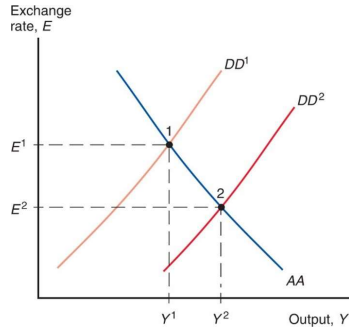


By shifting AA^1 upward, a temporary increase in the money supply causes a currency depreciation and a rise in output.

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 the demand for real monetary assets,
 - thereby increasing interest rates,
 - causing the domestic currency to appreciate (E falls).

Figure 6.11 Effects of a Temporary Fiscal Expansion

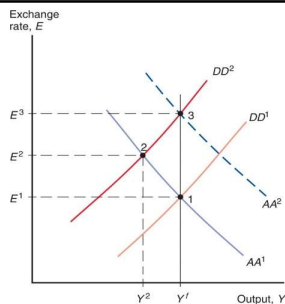


By shifting DD^1 to the right, a temporary fiscal expansion causes a currency appreciation and a rise in output.

Policies to Maintain Full Employment (1 of 3)

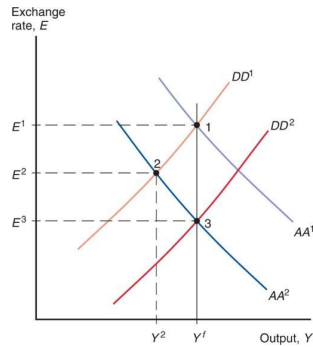
- Resources used in the production process can either be over-employed or underemployed.
- When resources are used effectively and sustainably, economists say that production is at its potential or natural level.
 - When resources are not used effectively, resources are underemployed: high unemployment, 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.

Figure 6.12 Maintaining Full Employment after a Temporary Fall in World Demand for Domestic Products



A temporary fall in world demand shifts DD^1 to DD^2 , reducing output from Y^1 to Y^2 and causing the currency to depreciate from E^1 to E^2 (point 2). Temporary fiscal expansion can restore full employment (point 1) by shifting the DD schedule back to its original position. Temporary monetary expansion can restore full employment (point 3) by shifting AA^1 to AA^2 . The two policies differ in their exchange rate effects: The fiscal policy restores the currency to its previous value (E^1), whereas the monetary policy causes the currency to depreciate further, to E^3 .

Figure 6.13
Policies to
Maintain
Full
Employment
After a
Money
Demand
Increase



After a temporary money demand increase (shown by the shift from AA^1 to AA^2), either an increase in the money supply or temporary fiscal expansion can be used to maintain full employment. The two policies have different exchange rate effects: The monetary policy restores the exchange rate back to E^1 , whereas the fiscal policy leads to greater appreciation (E^3).

Policies to Maintain Full Employment (2 of 3)

- 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 (3 of 3)

- 2. Economic data are difficult to measure and to understand.
 - Policy makers cannot 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.

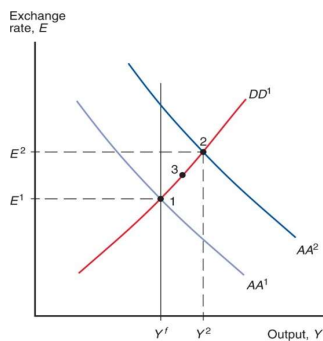
Permanent Changes in Monetary and Fiscal Policy

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

Permanent Changes in Monetary Policy

- A permanent increase in the quantity of monetary assets supplied has several effects:
 - It 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 (E rises) more than is the case when expectations are constant (Econ Chapter 14/Finance Chapter 3 results).
 - The AA curve shifts up (right) more than is the case when expectations are held constant.

Figure 6.14
Short-Run
Effects of a
Permanent
Increase in
the Money
Supply

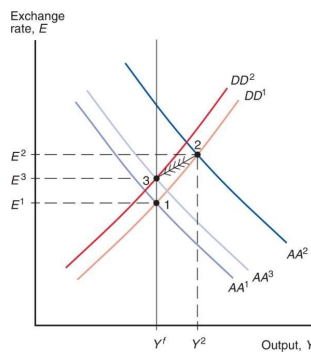


A permanent increase in the money supply, which shifts AA^1 to AA^2 and moves the economy from point 1 to point 2, has stronger effects on the exchange rate and output than an equal temporary increase, which moves the economy only to point 3.

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 for 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?

Figure 6.15
Long-Run
Adjustment to a
Permanent
Increase in the
Money
Supply



After a permanent money supply increase, a steadily increasing price level shifts the DD and AA schedules to the left until a new long-run equilibrium (point 3) is reached.

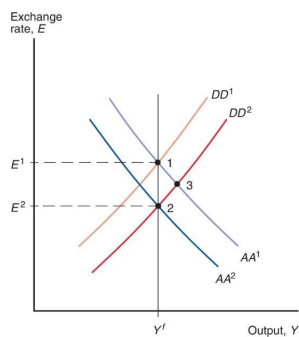
Effects of Permanent Changes in Fiscal Policy (1 of 2)

- 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 (2 of 2)

- 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.

Figure 6.16
Effects of a
Permanent
Fiscal
Expansion



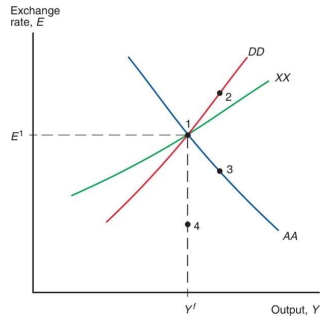
Because a permanent fiscal expansion changes exchange rate expectations, it shifts AA^1 leftward as it shifts DD^1 to the right. The effect on output (point 2) is nil if the economy starts in long-run equilibrium. A comparable **temporary** fiscal expansion, in contrast, would leave the economy at point 3.

Macroeconomic Policies and the Current Account (1 of 4)

- 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.

Figure 6.17 How Macroeconomic Policies Affect the Current Account

at point 2, $CA > X$



Along the curve XX , the current account is constant at the level $CA = X$. Monetary expansion moves the economy to point 2 and thus raises the current account balance. Temporary fiscal expansion moves the economy to point 3, while permanent fiscal expansion moves it to point 4; in either case, the current account balance falls.

Macroeconomic Policies and the Current Account (2 of 4)

- The XX curve slopes upward but is flatter than the DD curve.
 - DD represents equilibrium values of aggregate demand and domestic output.
 - As domestic income and production increase, domestic saving increases, which means that aggregate demand (willingness to spend) **by domestic residents** does not rise as rapidly as income and production.

Macroeconomic Policies and the Current Account (3 of 4)

- 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 (4 of 4)

- 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.

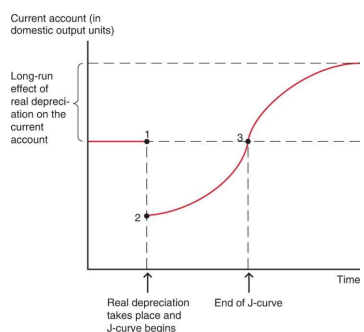
Value Effect, Volume Effect, and the J-Curve (1 of 3)

- 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:

$$CA \approx EX - IM.$$

- 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.

Figure 6.18 The J-Curve



The J-curve describes the time lag with which a real currency depreciation improves the current account.

Value Effect, Volume Effect, and the J-Curve (2 of 3)

- **Pass-through** from the exchange rate to import prices measures the percentage by which import prices change when the value of the domestic currency changes by 1%.
- 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.

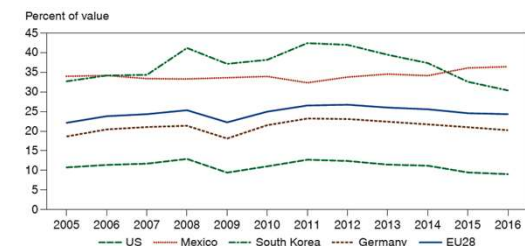
Value Effect, Volume Effect, and the J-Curve (3 of 3)

- 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.
 - the 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.

Global Value Chains and Exchange Rate Effects of Export and Import Prices

- Some imported intermediate goods become part of goods that are exported, leading to complex global value chains in which multiple countries produce portions of the value added of final products.
- For many countries, imported value accounts for a significant portion of the gross value of exports (backward linkages).
 - A country's exports may go on to be included in exports from other countries (forward linkages).
- Backward and forward linkages tend to dampen the effects of currency depreciations by creating offsetting forces.

Figure 6.19 Import Content of Exports for Selected Countries in the European Union, 2005–2016



Imported value added can account for a significant fraction of the value of exports.

Source: OECD.

The Liquidity Trap (1 of 3)

- During the Great Depression of the 1930s, the nominal interest rate hit zero in the United States, and the country found itself in a **liquidity trap**.
- Once an economy's nominal interest rate falls to zero, a central bank experiences difficulty lowering it any further.
 - At negative nominal interest rates, people find holding money preferable to bonds.
 - Central banks may want to avoid the **zero lower bound (ZLB)** on the nominal interest rate to keep monetary expansion as an option.
 - Starting in 2014, some major central banks have pushed nominal interest rates into slightly negative territory.

The Liquidity Trap (2 of 3)

- The dilemma facing a central bank when the economy is in a liquidity trap slowdown can be seen by considering the interest parity condition when the domestic interest rate $R = 0$,

$$R = 0 = R^* + (E^e - E) / E.$$

- Assume for the moment that the expected future exchange rate, E^e , is fixed.
- Suppose the central bank raises the domestic money supply so as to depreciate the currency temporarily
 - that is, to raise E today but return the exchange rate to the level E^e later.

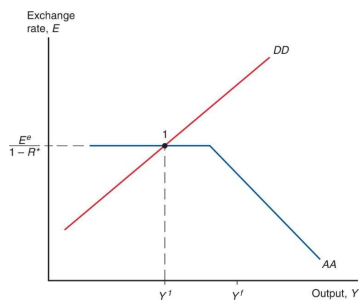
The Liquidity Trap (3 of 3)

- The interest parity condition shows that E cannot rise once $R = 0$ because the interest rate would have to become negative.
- Instead, despite the increase in the money supply, currency cannot depreciate further and the exchange rate remains steady at

$$E = E^* / (1 - R^*)$$

- At an interest rate of $R = 0$, people are indifferent between bonds and money as both yield a zero nominal rate of return.
 - An increase in the money supply has no effect on the economy!

Figure 6.20 A Low-Output Liquidity Trap



At point 1, output is below its full employment level. Because exchange rate expectations E^* are fixed, however, a monetary expansion will merely shift AA to the right, leaving the initial equilibrium point the same. The horizontal stretch of AA gives rise to the liquidity trap.

Summary (1 of 3)

1. Aggregate demand is influenced by disposable income and the real exchange rate.
2. The DD curve shows combinations of exchange rates and output where aggregate demand = aggregate output.
3. The AA curve shows combinations of exchange rates and output where the foreign exchange markets and money market are in equilibrium.

Summary (2 of 3)

4. In the *DD-AA* model, we assume that a depreciation of the domestic currency leads to an increase in the current account and aggregate demand.
5. But reality is more complicated, and the *J-curve* shows that the value effect at first dominates the volume effect.

Summary (3 of 3)

6. A temporary increase in the money supply is predicted to increase output and depreciate the domestic currency.
7. A permanent increase does both to a larger degree in the short run, but in the long run output returns to its normal level.
8. A temporary increase in government purchases is predicted to increase output and appreciate the domestic currency.
9. A permanent increase in government purchases is predicted to completely crowd out net exports, and therefore to have no effect on output.

Figure 6A1.1 Change in Output and Saving

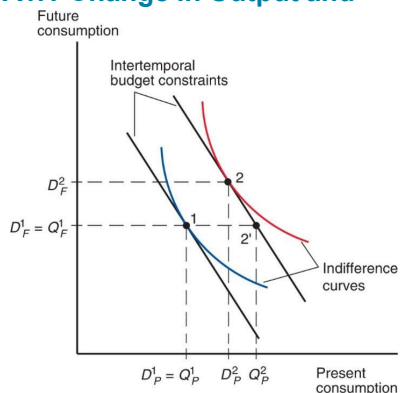


Table 6A2.1 Estimated Price Elasticities for International Trade in Manufactured Goods

Country	η			η^*		
	Impact	Short-run	Long-run	Impact	Short-run	Long-run
Austria	0.39	0.71	1.37	0.03	0.36	0.80
Belgium	0.18	0.59	1.55	—	—	0.70
Britain	—	—	0.31	0.60	0.75	0.75
Canada	0.08	0.40	0.71	0.72	0.72	0.72
Denmark	0.82	1.13	1.13	0.55	0.93	1.14
France	0.20	0.18	1.25	—	0.49	0.60
Germany	—	—	1.41	0.57	0.77	0.77
Italy	—	0.56	0.64	0.94	0.94	0.94
Japan	0.59	1.01	1.61	0.16	0.72	0.97
Netherlands	0.24	0.49	0.89	0.71	1.22	1.22
Norway	0.40	0.74	1.49	—	0.01	0.71
Sweden	0.27	0.73	1.59	—	—	0.94
Switzerland	0.28	0.42	0.73	0.25	0.25	0.25
United States	0.18	0.48	1.67	—	1.06	1.06

Source: Estimates come from Jacques R. Artus and Malcolm D. Knight, **Issues in the Assessment of the Exchange Rates of Industrial Countries**, Occasional Paper 29, Washington, D.C.: International Monetary Fund, July 1984, table 4. Dashes indicate unavailable estimates.