

Friday: PS5 5th floor, Solution later

This week: past final, Final Guide (limit scope)

Monday: Lecture: recap/review

Bring any Q on any lecture, PS, Exam, Text Reading

Monday Later: GSI Joint Review Location TBA

Wednesday: Final Comprehensive

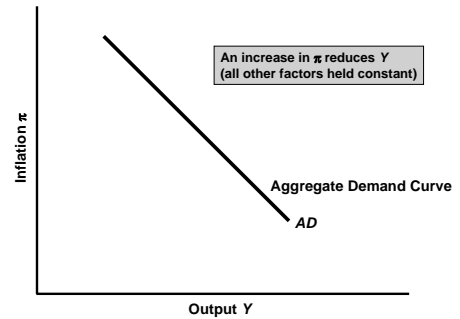
### Inflation, Spending, and Output: The Aggregate Demand Curve

- Aggregate Demand ( $AD$ ) Curve
  - Increases in inflation reduce planned spending and short-run equilibrium output, so the aggregate demand curve is downward-sloping

### Inflation, Spending, and Output: The Aggregate Demand Curve

- Inflation, the Fed, and the  $AD$  Curve
  - The Keynesian model assumes output adjusts to demand at preset prices in the short run.
  - Prices do not remain fixed indefinitely.
  - The Keynesian model does not explain the behavior of inflation.

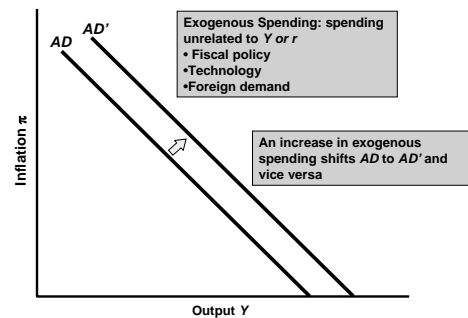
### The Aggregate Demand Curve

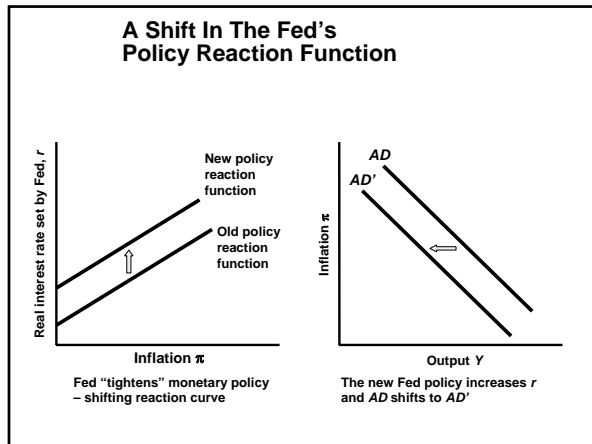


### Inflation, Spending, and Output: The Aggregate Demand Curve

- Inflation, the Fed, and the  $AD$  Curve
  - The Fed can reduce autonomous expenditure by raising the interest rate.
    - ◆  $\pi$  increases  $\rightarrow r$  increases  $\rightarrow$  autonomous spending decreases  $\rightarrow Y$  decreases ( $AD$  curve)

### Effect of An Increase In Exogenous Spending





### Inflation, Spending, and Output: The Aggregate Demand Curve

- Movements Along the *AD* Curve
  - $\pi$  and  $Y$  are inversely related
  - Changes in  $\pi$  cause a change in  $Y$  or a movement along the *AD* curve
  - $\pi$  increases  $\rightarrow r$  increases  $\rightarrow$  planned spending decreases  $\rightarrow Y$  decreases

### Inflation, Spending, and Output: The Aggregate Demand Curve

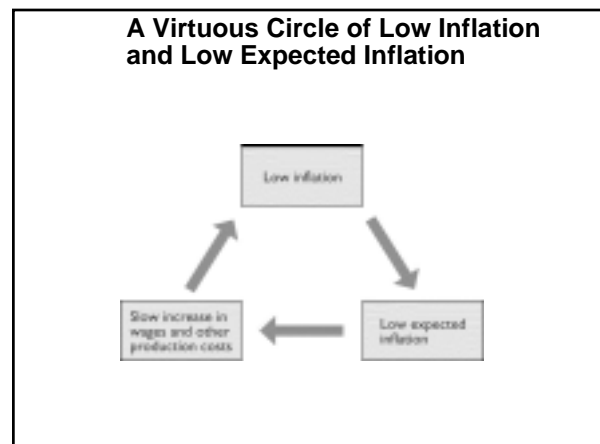
- Shifts of the *AD* Curve
  - Any factor that changes  $Y$  at a given  $\pi$  shifts the *AD* curve.
  - Shifts of the *AD* curve can be caused by:
    - ◆ Changes in exogenous spending.
    - ◆ Changes in the Fed's policy reaction function.

### Inflation and Aggregate Supply

- Three factors that can increase the inflation rate
  - Output gap
  - Inflation shock
  - Shock to potential output

### Inflation and Aggregate Supply

- Inflation Inertia
  - In industrial economies (U.S.), inflation tends to change slowly from year to year.
  - The *inflation inertia* occurs for two reasons:
    - ◆ Inflation expectations
    - ◆ Long-term wage and price contracts



### Inflation and Aggregate Supply

- Long-term Wage and Price Contracts
  - Union wage contracts set wages for several years.
  - Contracts setting the price of raw materials and parts for manufacturing firms also cover several years.
  - These long-term contracts reflect the inflation expectations at the time they are signed.

### The Output Gap and Inflation

| Relationship of output to potential output | Behavior of inflation                 |
|--|---------------------------------------|
| 1. No output gap<br>$Y = Y^*$              | → Inflation remains unchanged         |
| 2. Expansionary gap<br>$Y > Y^*$           | → Inflation rises<br>$\pi \uparrow$   |
| 3. Recessionary gap<br>$Y < Y^*$           | → Inflation falls<br>$\pi \downarrow$ |

### Inflation and Aggregate Supply

- The Output Gap and Inflation
  - If  $Y^* = Y$ 
    - ◆ An increase in exogenous spending creates an expansionary gap ( $Y > Y^*$ ) – inflation increases
    - ◆ A decrease in exogenous spending creates a recessionary gap ( $Y < Y^*$ ) and inflation decreases

### Inflation and Aggregate Supply

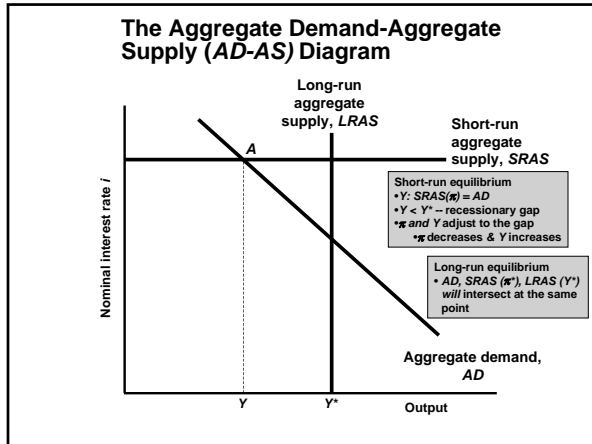
- The Aggregate Demand—Aggregate Supply Diagram
  - Long-run aggregate supply (*LRAS*)
    - ◆ A vertical line showing the economy's potential output  $Y^*$

### Inflation and Aggregate Supply

- The Aggregate Demand—Aggregate Supply Diagram
  - Short-run Aggregate Supply (*SRAS*)
    - ◆ A horizontal line showing the current rate of inflation, as determined by past expectations and pricing decisions

### Inflation and Aggregate Supply

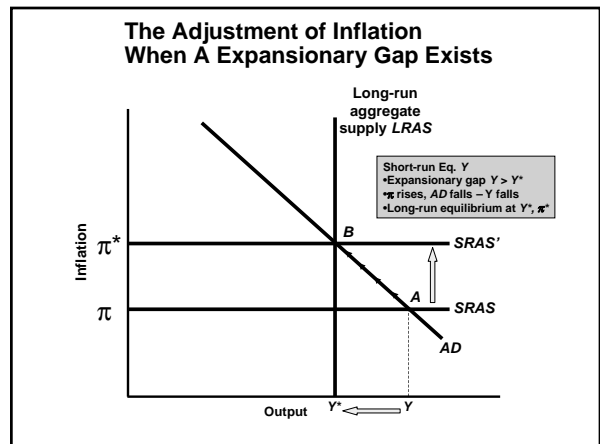
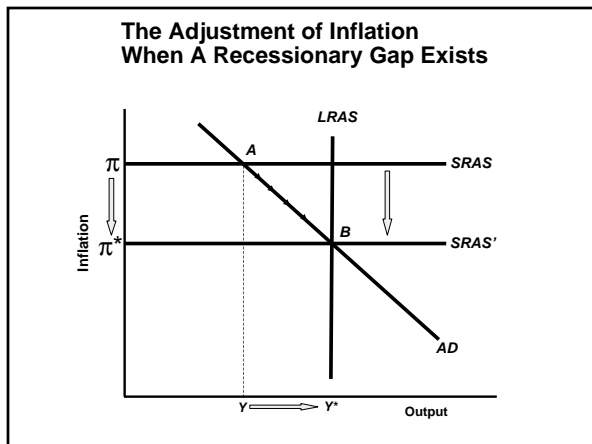
- The Aggregate Demand—Aggregate Supply Diagram
  - Short-run Equilibrium
    - ◆ A situation in which inflation equals the value determined by past expectations and pricing decisions and output equals the level of short-run equilibrium output that is consistent with that inflation rate
    - ◆ Graphically, short-run equilibrium occurs at the intersection of the *AD* curve and the *SRAS* line



- ### Inflation and Aggregate Supply
- The Aggregate Demand—Aggregate Supply Diagram
    - Long-run Equilibrium
      - ◆ A situation in which actual output equals potential output and the inflation rate is stable
      - ◆ Graphically, long-run equilibrium occurs when the AD curve, the SRAS line, and the LRAS line all intersect at a single point

- ### Inflation and Aggregate Supply
- A Review of the Adjustment Process to a Recessionary Gap
    - Firms that are selling less than they want to will start to lower prices.
    - As  $\pi$  falls the Fed lowers  $r$  and AD increases.
    - Falling  $\pi$  reduces uncertainty which also increases AD

- ### Inflation and Aggregate Supply
- A Review of the Adjustment Process to a Recessionary Gap
    - As  $Y$  increases, cyclical unemployment falls (Okun's Law)
    - Adjustment continues until long-run equilibrium is reached.



### Inflation and Aggregate Supply

- The Self-Correcting Economy
  - In the long-run the economy tends to be self-correcting.
  - The Keynesian model does not include a self-correcting mechanism.

### Inflation and Aggregate Supply

- The Self-Correcting Economy
  - The Keynesian model concentrates on the short-run with no price adjustment.
  - The self-correcting mechanism concentrates on the long-run with price adjustments.

### Inflation and Aggregate Supply

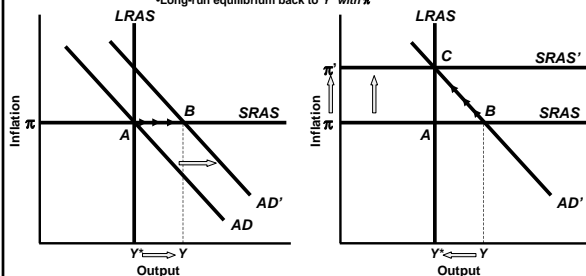
- The Self-Correcting Economy
  - A slow self-correcting mechanism
    - ◆ Fiscal and monetary policy can help stabilize the economy.
  - A fast self-correcting mechanism
    - ◆ Fiscal and monetary policy are not effective and may destabilize the economy.

### Inflation and Aggregate Supply

- The Self-Correcting Economy
  - The speed of correction will depend on:
    - ◆ The use of long-term contracts.
    - ◆ The efficiency and flexibility of labor markets.
  - Fiscal and monetary policy are most useful when attempting to eliminate large output gaps.

### War and Military Buildup As A Source of Inflation

- ◆ Increase in military spending causes AD to increase
- ◆ Creates an expansionary gap –  $Y > Y^*$
- ◆  $\pi$  increases shifting SRAS to SRAS'
- ◆ Long-run equilibrium back to  $Y^*$  with  $\pi^*$



### Sources of Inflation



#### Economic Naturalist

- How did inflation get started in the United States in the 1960s?
  - ◆ 1959-63 inflation averaged about 1%
  - ◆ By 1970 inflation was 7%

### Sources of Inflation

- Inflation Shock
  - A sudden change in the normal behavior of inflation, unrelated to the nation's output gap

### Sources of Inflation

- Inflation Shock -- Examples
  - OPEC embargo of 1973
  - Drop in oil prices in 1986

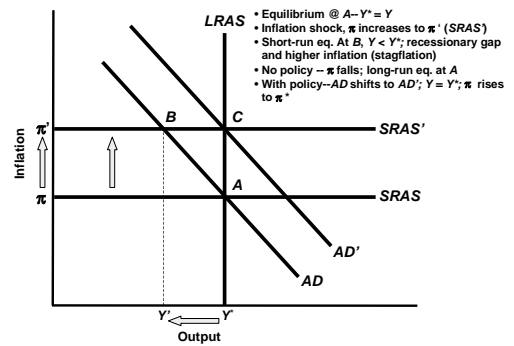
### Sources of Inflation



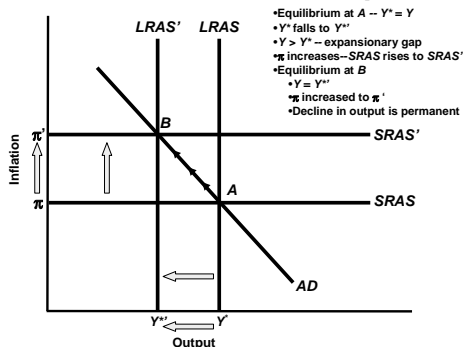
#### Economic Naturalist

- Why did inflation escalate in the United States in the 1970s?

### The Effects of An Adverse Inflation Shock



### The Effects of a Shock To Potential Output



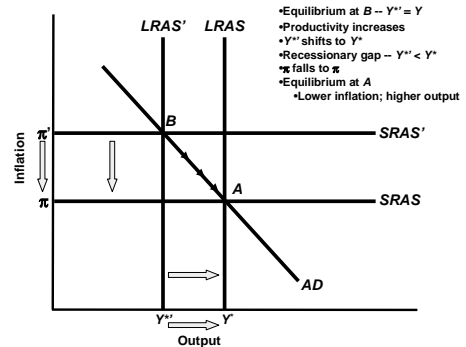
### Sources of Inflation

- Aggregate Supply Shock
  - Either an inflation shock or a shock to potential output
  - Adverse aggregate supply shocks of both types reduce output and increase inflation

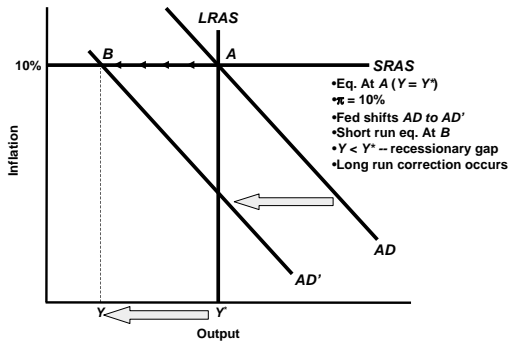
### Sources of Inflation

- Shocks to Potential Output
  - Aggregate supply shock
    - ◆ Inflation shocks
      - Stagflation
      - Temporary reduction in output
    - ◆ Potential output shocks
      - Stagflation
      - Permanent reduction in output

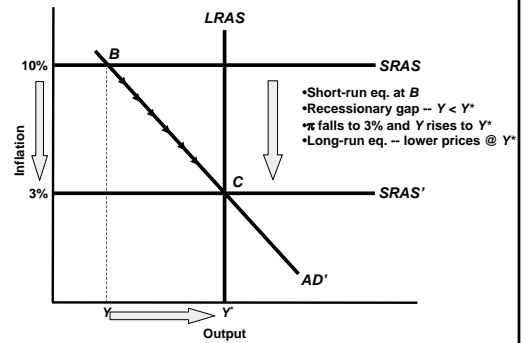
### From: Economic Naturalist



### Short-Run Effects of an Anti-inflationary Monetary Policy



### Long-Run Effects of an Anti-inflationary Monetary Policy



### Summary

- AD downward sloping (inflation vs output)
- SRAS (Inflation Adjustment Line) level of inflation in SR
- SR Equil: AD=SRAS
- LRAS potential output
- LR Equil: AD=SRAS=LRAS
- Rec Output Gap: Inflation falls
- Exp Output Gap: Inflation rises
- Shifts of AD (Fed Policy Shifts, Exogenous Spending Change)
- Shifts of SRAS (inflation shock)
- Shift of LRAS (potential output shock)
- Economy self-corrects in LR. If slow/big gap, stabilize

### Exchange Rates

- Some Definitions
  - $e$  = nominal exchange rate
  - $e$  = the number of units of foreign currency that the domestic currency will buy
  - If  $e$  increases, it is an *appreciation* of the domestic currency.
  - If  $e$  decreases, it is a *depreciation* of the domestic currency.

### Exchange Rates

- Appreciation
  - An increase in the value of a currency relative to other currencies
- Depreciation
  - A decrease in the value of a currency relative to other currencies

### Exchange Rates

- Flexible Exchange Rate
  - An exchange rate whose value is not officially fixed but varies according to the supply and demand for the currency in the foreign exchange market
  - Foreign Exchange market: currencies of various nations are traded for one another

### Exchange Rates

- Fixed Exchange Rate
  - An exchange rate whose value is set by official government policy

### Exchange Rates

- The Real Exchange Rate
  - Nominal exchange rate
    - ◆ The price of the domestic currency in terms of a foreign currency
  - Real exchange rate
    - ◆ The price of the average domestic good or service relative to the price of the average foreign good or service, when the prices are expressed in terms of a common currency

### Exchange Rates

- Example
  - Should you buy a Japanese or American computer for your company?
    - ◆ Price of U.S. computer = \$2,400
    - ◆ Price of Japanese computer = 242,000 yen
    - ◆ Exchange rate = 110 yen/dollar

### Exchange Rates

- Example
  - Should you buy a Japanese or American computer for your company?
    - ◆ Price in yen = price in dollars x value of dollar in terms of yen
    - ◆ Price in dollars = price in yen/yen-dollar exchange rate
      - Price in dollars = 242,000 yen/110 = \$2,200
      - Real exchange rate = \_\_\_\_\_
      - buy \_\_\_\_\_



### Exchange Rates

#### ■ Real Exchange Rate

$$\text{Real Exchange Rate} = \frac{\text{Price of domestic good } (P)}{\text{Price of foreign good, in dollars } (P' e)}$$
$$\text{Real Exchange Rate} = \frac{P}{P' e}$$
$$\text{Real Exchange Rate} = \frac{eP}{P'}$$

### Exchange Rates

#### ■ The Real Exchange Rate

- A high real exchange rate implies that domestic producers will have difficulty exporting to other countries.
- A high real exchange rate will attract imports.
- $NX$  will tend to be low when the real exchange rate is high.
- Real and nominal exchange rates tend to move in the same direction

### Exchange Rates



#### Economic Naturalist

- Does a strong currency imply a strong economy?

### The Determination of the Exchange Rate

#### ■ Law of One Price

- If transportation costs are relatively small, the price of an internationally traded commodity must be the same in all locations

### The Determination of the Exchange Rate

#### ■ Example

- How many Indian rupees equal to one Australian dollar?
  - ◆ Bushel of grain cost 5 Australian dollars or 150 rupees
  - ◆ 5 Australian dollars = 150 rupees
  - ◆ Nominal exchange should equal 30 rupees/Australian dollar

### The Determination of the Exchange Rate

#### ■ Purchasing Power Parity (PPP) THEORY

- The theory that nominal exchange rates are determined as necessary for the law of one price to hold

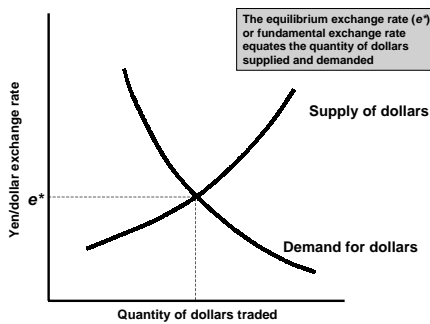
### The Determination of the Exchange Rate

- Purchasing Power Parity (PPP)
- PREDICTION OF THEORY
  - In the long run, the currencies of countries that experience significant inflation will tend to depreciate.

### The Determination of the Exchange Rate

- Limits to the PPP Theory
  - ◆ Not all goods and services are traded internationally.
    - The greater the share of non-traded goods, the less precise the PPP theory
  - ◆ Not all internationally traded goods and services are perfectly standardized commodities.
- ◆ PPP Theory more valid in LR than (not in SR)

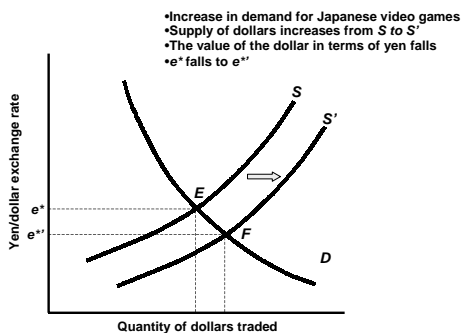
### The Supply and Demand for Dollars In The Yen-Dollar Market



### The Determination of the Exchange Rate

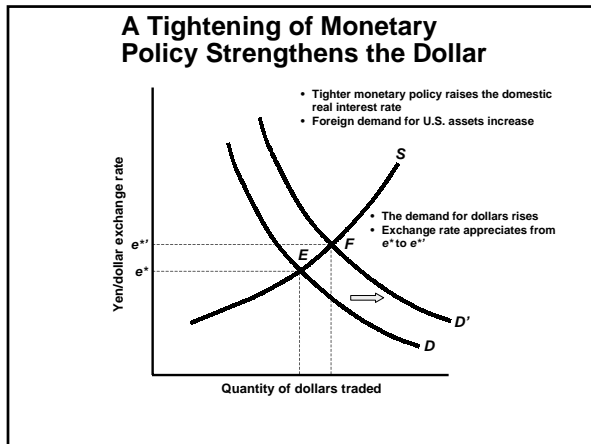
- Changes in the Supply of Dollars
  - Factors that increase the supply of dollars
    - ◆ An increase in the preference for Japanese goods
    - ◆ An increase in U.S. real GDP
    - ◆ An increase in the real interest rate on Japanese assets

### An Increase In The Supply of Dollars Lowers The Value of The Dollar



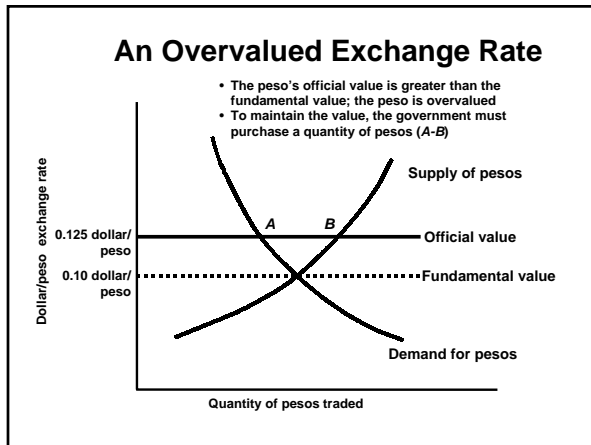
### The Determination of the Exchange Rate

- Changes in the Demand for Dollars
  - Factors that increase the demand for dollars
    - ◆ Increased preference for U.S. goods
    - ◆ Increase in real GDP abroad
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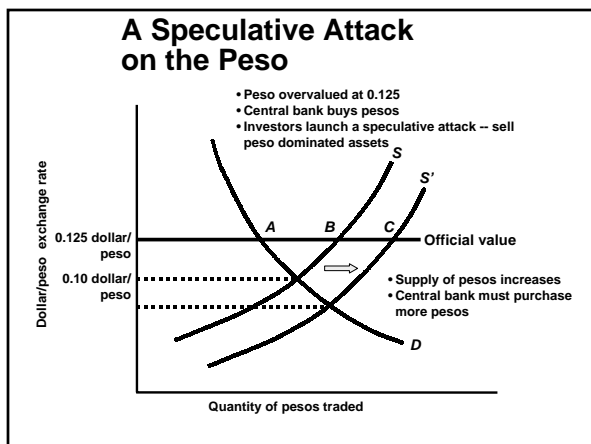
### Monetary Policy and the Exchange Rate

- The Exchange Rate as a Tool of Monetary Policy
  - When the exchange rate is flexible:
    - Tighter monetary policy reduces net exports.
    - Easier monetary policy stimulates net exports.
    - Monetary policy is more effective in an open economy with flexible exchange rates.



### Fixed Exchange Rates

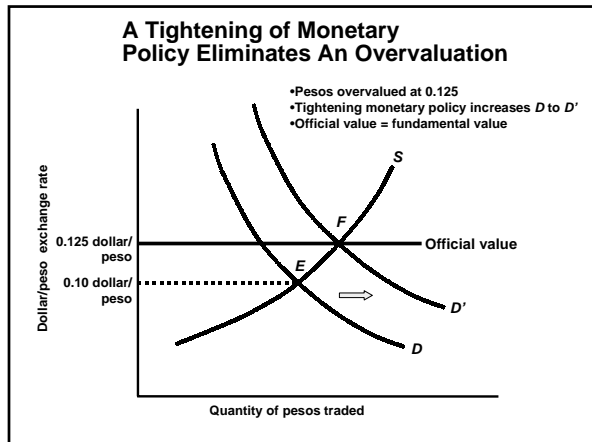
- International Reserves
  - Foreign currency assets held by a government for the purpose of purchasing the domestic currency in the foreign exchange market.



### Fixed Exchange Rates

Economic Naturalist

- Can a speculative attack occur under flexible exchange rates?



### Fixed Exchange Rates

- Observation
  - The conflict monetary policymakers face, between stabilizing the exchange rate and stabilizing the domestic economy, is most severe when the exchange rate is under a speculative attack.

### Should Exchange Rates Be Fixed or Flexible?

- Monetary Policy
  - Flexible exchange rates can strengthen the impact of monetary policy.
  - Fixed exchange rates prevent the use of monetary policy to stabilize the economy.