

TOPIC 8

International Economics

Goals of Topic 8

- What is the exchange rate?
- NX back!! What is the link between the exchange rate and net exports?
- What is the trade deficit?
- How do different shocks affect the exchange rate and net exports?
- How do different policies affect the trade deficit?
- Has the current recession been transmitted abroad?

Nominal exchange rates

- The **nominal exchange rate** is the rate at which two currencies are exchanged!
- Example: the nominal exchange rate between the US dollars and the Japanese Yen is 110 yen per dollar
- It means that 1 dollar can buy 110 yen in the **foreign exchange market** (the market for international currencies)
- More technically:

The nominal exchange rate, e_{nom} , between two currencies is the number of units of foreign currency that can be purchased with 1 unit of domestic currencies.

Real Exchange Rates

- If you know that $e_{\text{nom}} = 110$ yen, do you know if it is cheaper to leave in Japan or in the US?
- NO! You need more information about prices ...
- The **real exchange rate** is the price of domestic goods relative to foreign goods
- More technically

The real exchange rate, e , is the number of foreign goods that can be obtained in exchange for 1 unit of the domestic good:

$$e = (e_{\text{nom}} * P) / P_f$$

Purchasing Power Parity (PPP)

- How are nominal and real exchange rates related?
- Imagine two countries produce the same goods and goods are freely traded.
- Then trade is possible only if real exchange rates are equal to 1!
- **PPP = the price of the domestic good must equal the price of the foreign good, in terms of the domestic currency:**

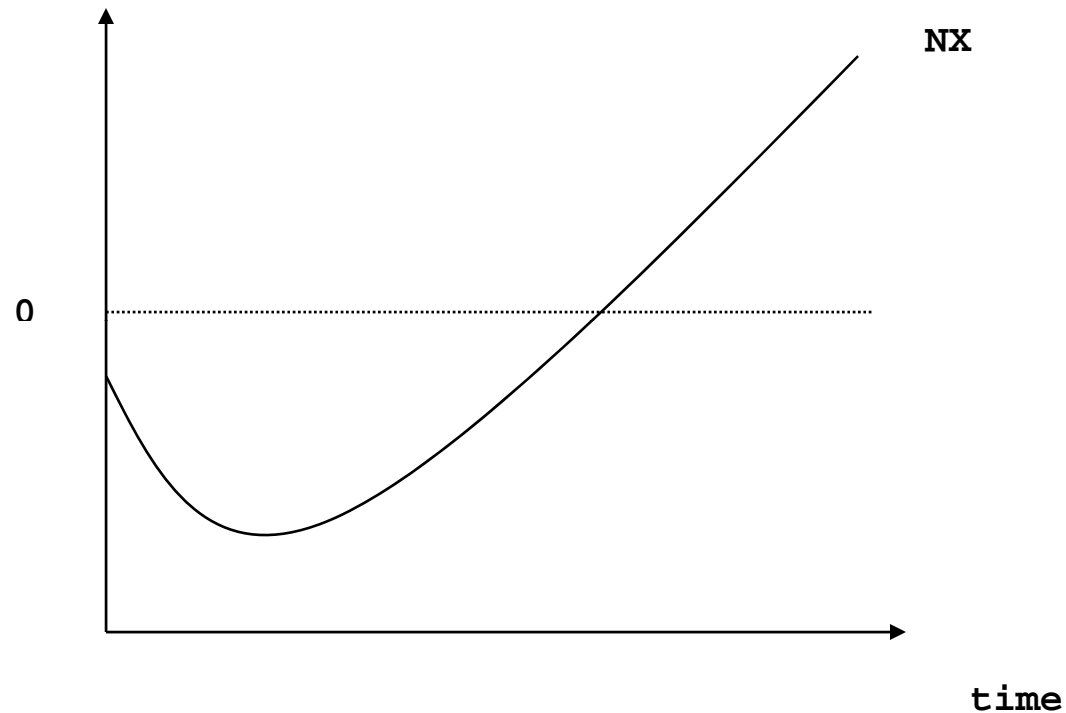
$$P = P_f / e_{\text{nom}} \rightarrow e_{\text{nom}} = P_f / P$$

- Empirical evidence: PPP tends to hold in the long run, but not in the short run. Why? Different goods, non-traded goods, trade tariffs,...

Why does the real exchange rate matters?

- Real exchange rate represents the rate at which domestic goods (and services) can be traded for those produced abroad (**terms of trade**)
- Why an **increase in the real exchange** matters?
 1. people are able to obtain more foreign goods in exchange for a given amount of domestic goods
 2. Net export is going to be lower (substitution effect!)
- Example: US cars costs twice as much as a Japanese cars. Then Americans will demand more Japanese cars, so import will increase. Japanese will demand less US cars, so export decrease. It follows that NX decrease!
- **Real exchange rate is the relative price of a country's good. If it increases, people will switch towards other countries' goods.**

Real exchange rate decreases: J curve



Japanese cars are more expensive than US ones.

Substitution effect can take time to kick in ...

On Impact: Americans import the same amount of Japanese cars, but they are more expensive. Then, the nominal value of import increases and NX decreases

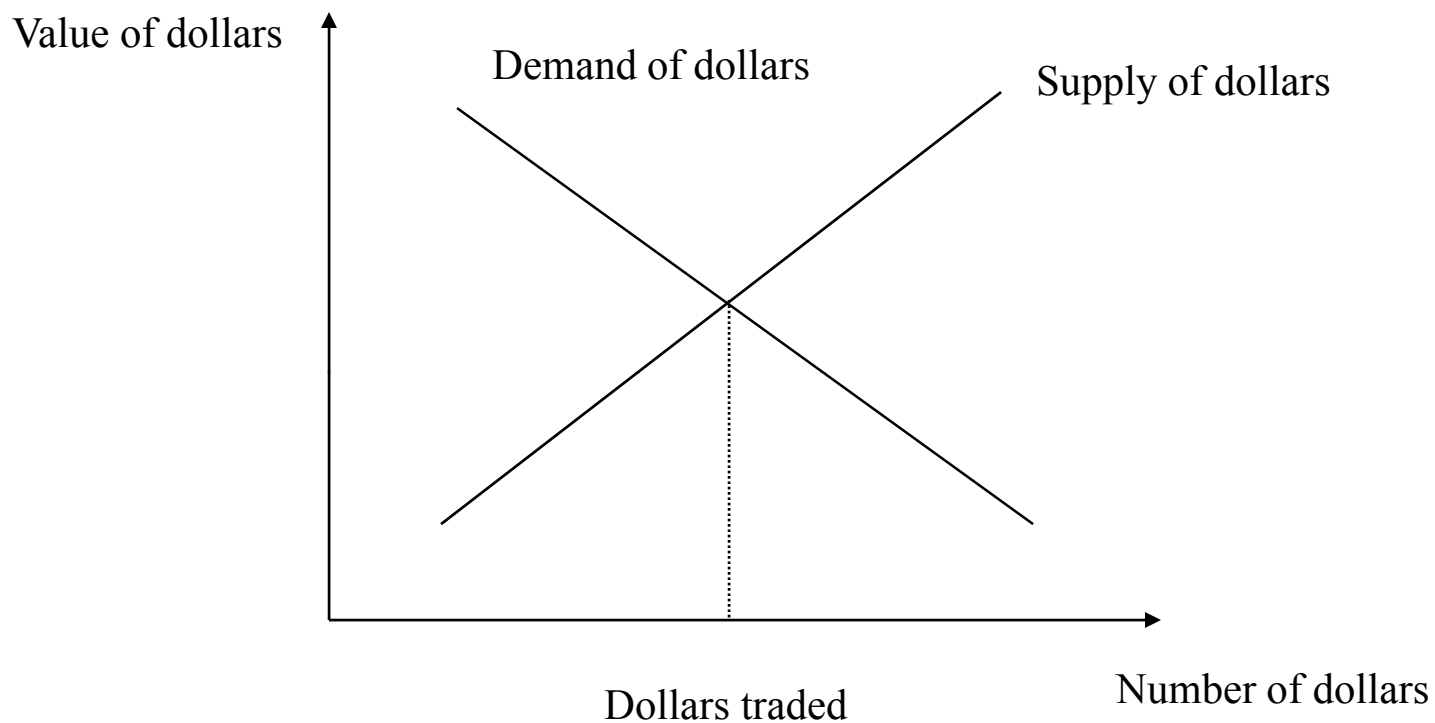
Later: American stop importing Japanese cars and NX increases.

From now on assume that a decrease of e increases NX!

Different exchange rate systems

- In a **flexible (or floating) exchange rate system**, exchange rates are determined by demand and supply in the foreign exchange market
- In a **fixed exchange rate system**, exchange rates are set at officially predetermined levels. The central bank commits to buy and sell its own currency at that rate (e.g. gold standard, Bretton Woods)
- **We focus on flexible exchange rate system and think about two countries: the domestic (US) and the foreign country (Japan)**
- I refer always to the nominal exchange rate, when I do not specify otherwise
- Increase in the real exchange rate = **appreciation** (revaluation in peg system)
- Decrease in the real exchange rate = **depreciation** (devaluation in peg system)

How is the exchange rate determined?

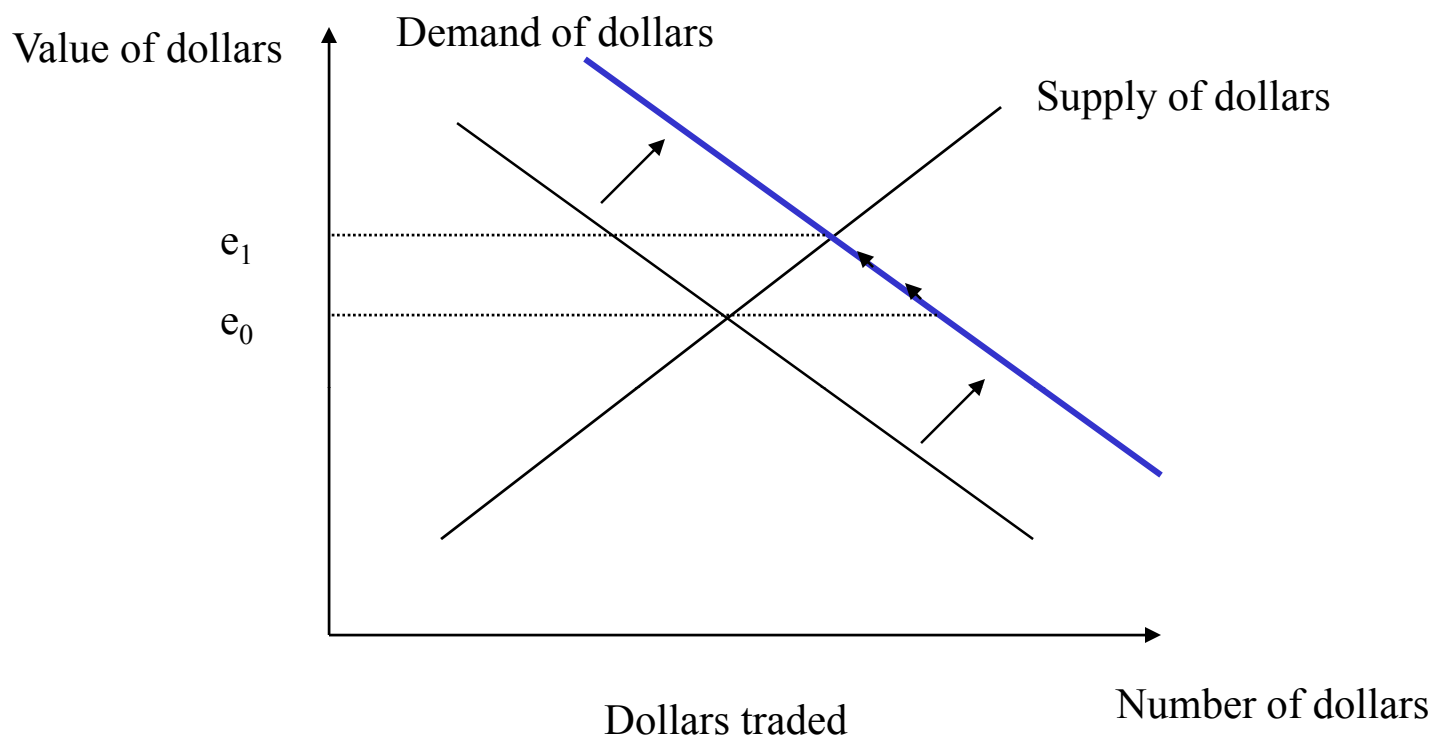


Nominal exchange rate = value of the dollar (yen/dollars)

Demand and Supply

- **Supply for dollars is upward-sloping**: when the value of the dollar is higher (you get a lot of yen for 1 dollar), then people supply more dollars
- **Demand for dollars is downward-sloping**: when the value of the dollar is higher (you have to pay a lot of yen to get 1 dollar), then people demand less dollars
- The amount of dollars traded in equilibrium and the equilibrium exchange rate is determined by the intersection of demand and supply (as in any market!)
- Why do Japanese **demand** dollars?
 1. To buy US goods and services (**US exports**)
 2. To buy US real and financial assets (**US financial inflows**)
- Why do Americans **supply** dollars (to get yen)?
 1. To buy Japanese goods and services (**US imports**)
 2. To buy Japanese real and financial assets (**US financial outflows**)

Increase in Quality of US exports

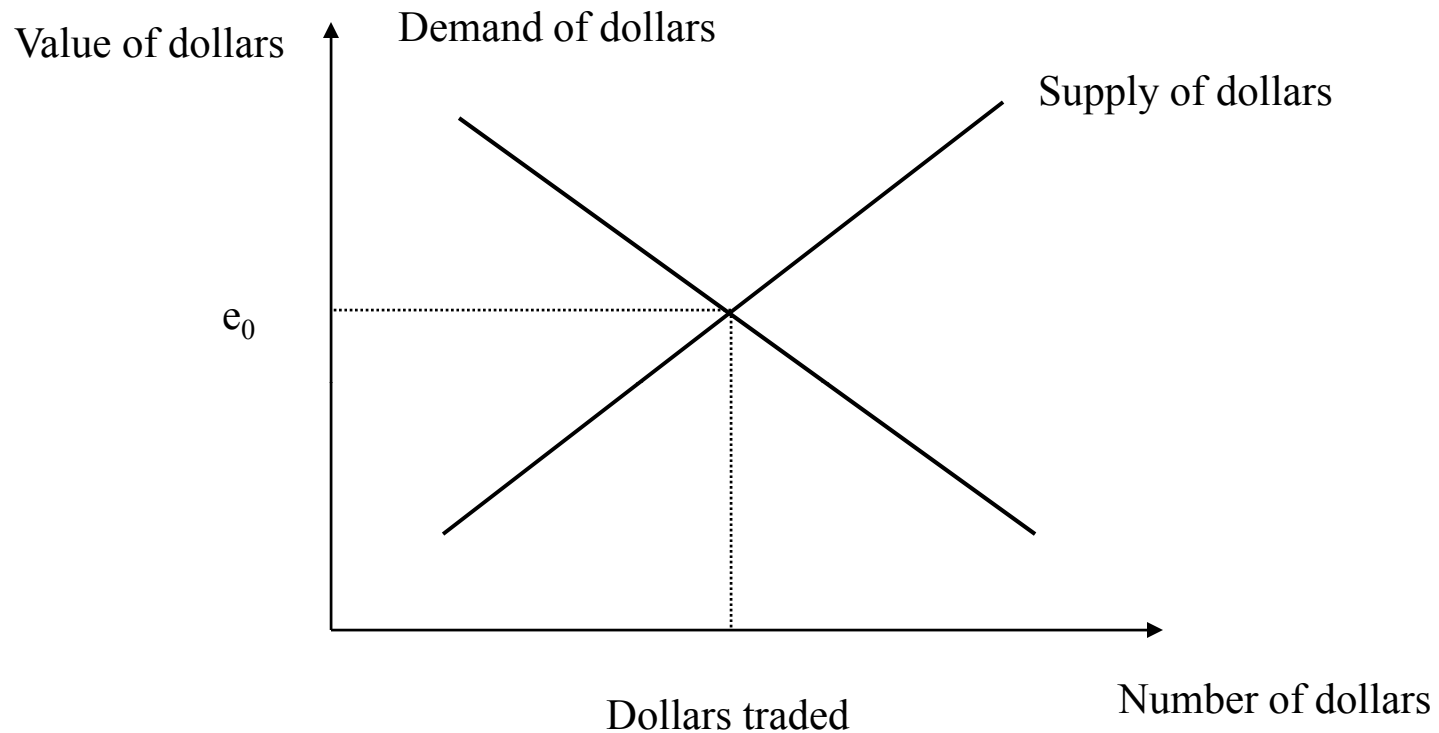


If Japanese wants to buy more US goods, they have to buy more dollars!

Hence, the value of dollar increases = **appreciation of the dollar**

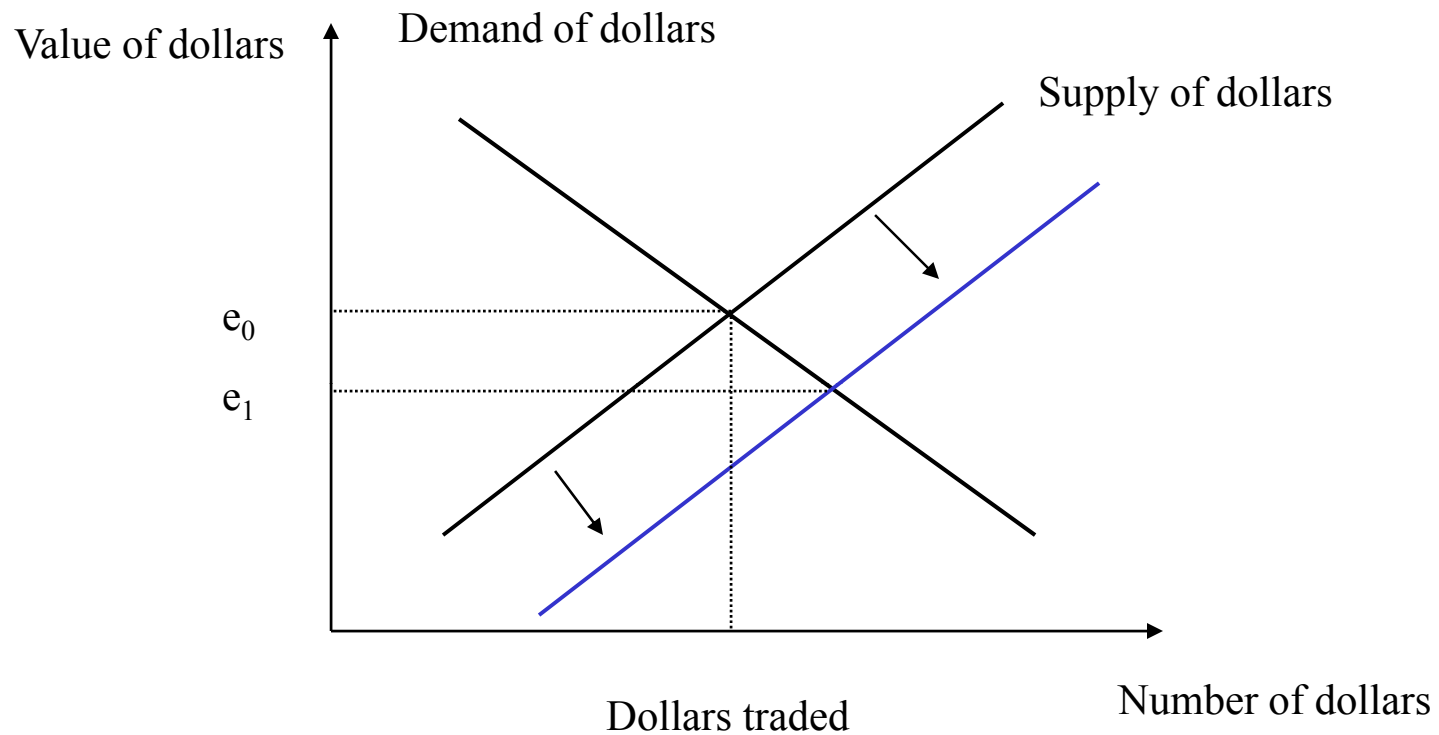
(Movement along Demand: substitution effect tend to reduce NX back)

(1) Increase in US GDP



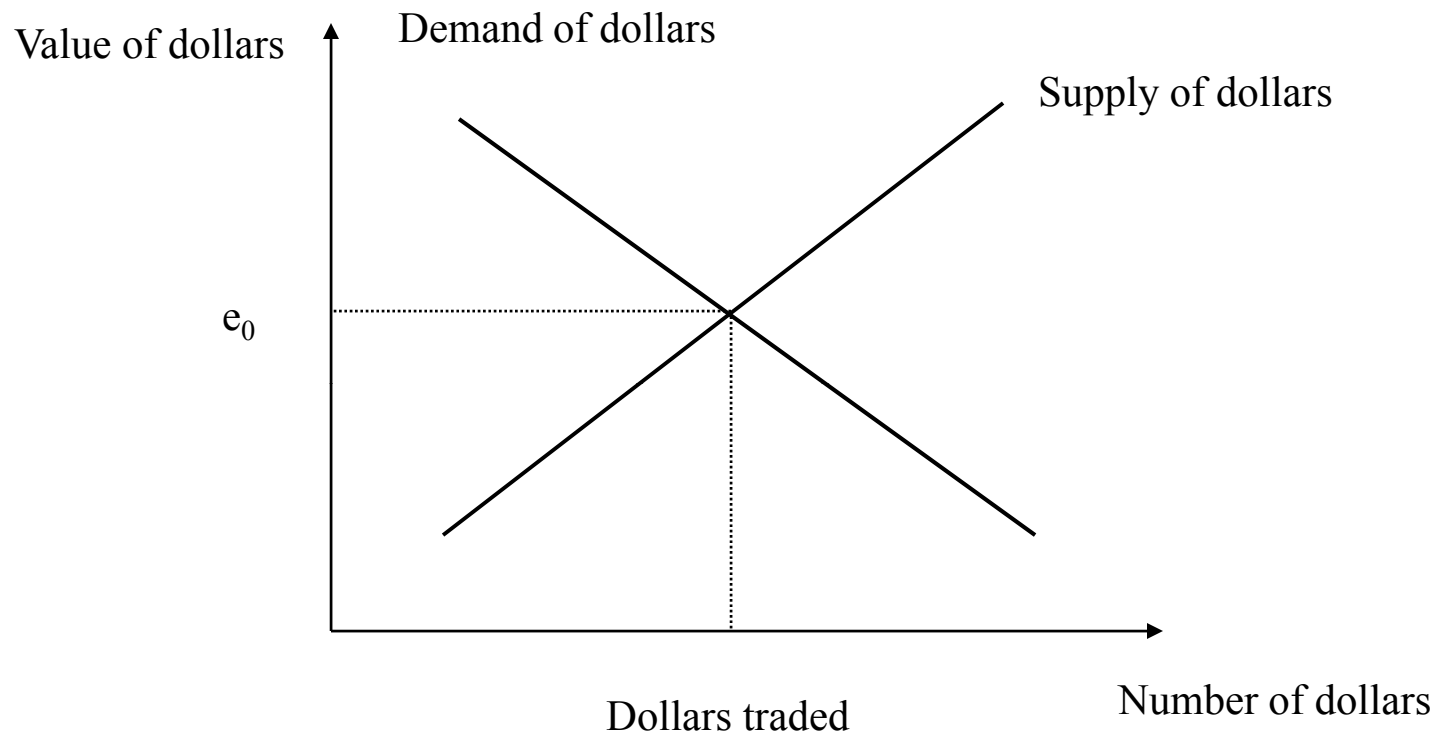
Americans want to consumer more of all goods, including Japanese ones!
Hence, they need more yen...

(1) Increase in US GDP



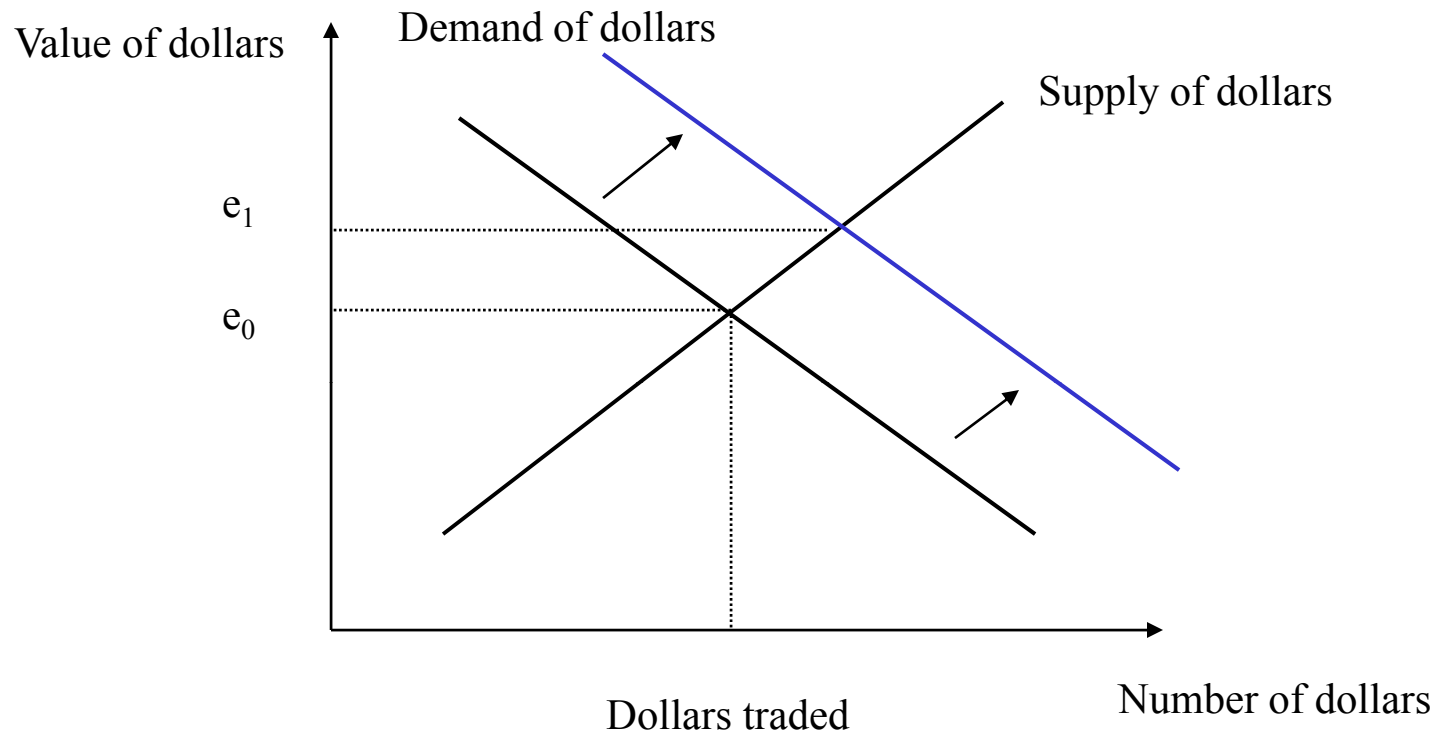
The dollar depreciates!

(2) Increase in Japanese GDP



Japanese want to consumer more of all goods, including US ones!
Hence, they need more dollars...

(2) Increase in Japanese GDP



The dollar appreciates!

Changes in GDP

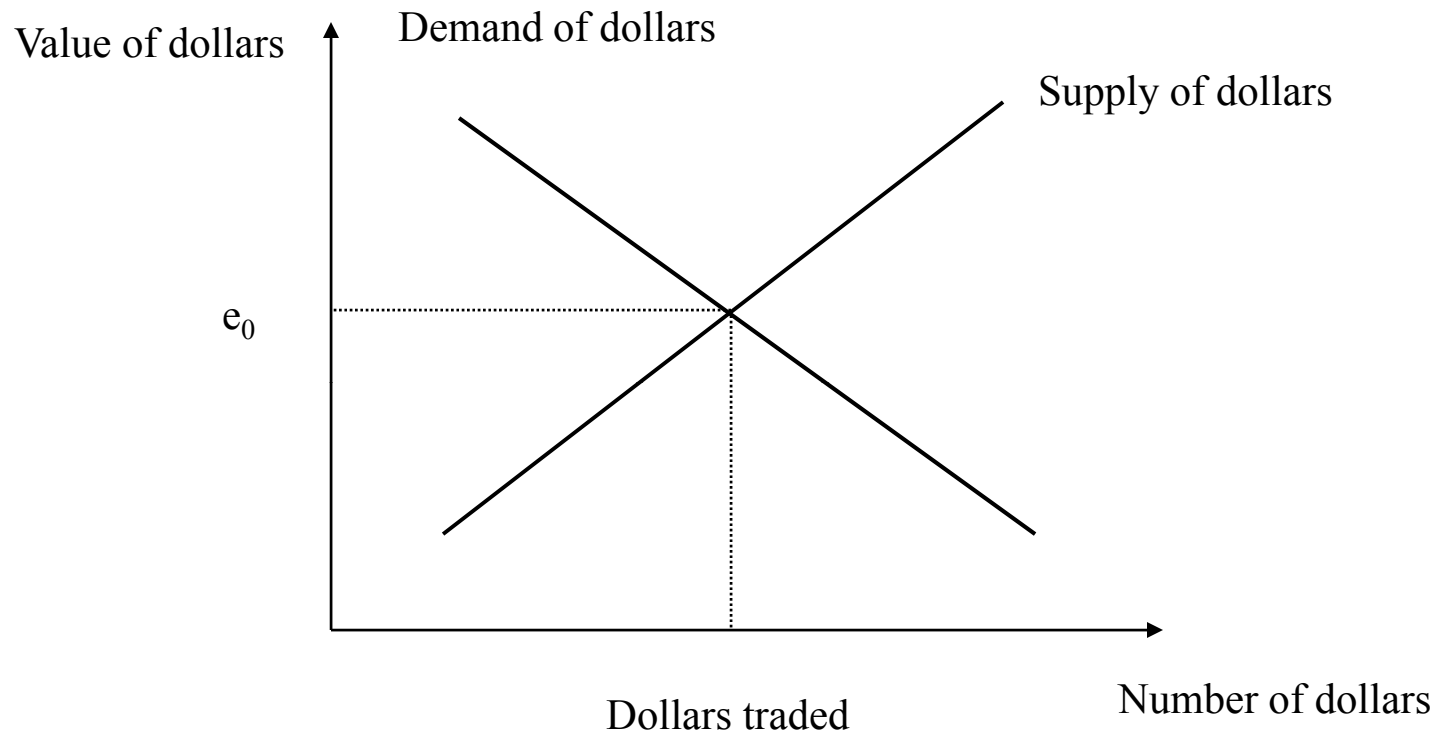
- **Increase in US GDP:**

1. Effect on net exports: when domestic income rises, consumers will spend more on all goods, including imports. Hence, **NX decreases** (everything else equal)
2. Effect on exchange rate: to increase imports they need more yen. Hence, they must supply more dollars! **The dollar depreciates.**

- **Increase in Japanese GDP:**

1. Effect on net exports: when Japanese income rises, Japanese consumers will spend more on all goods, including US goods. Hence, US exports increase and **NX increases**
2. Effect on exchange rate: to buy more US goods, Japanese need more dollars. The demand for dollars increases and the **dollar appreciates.**

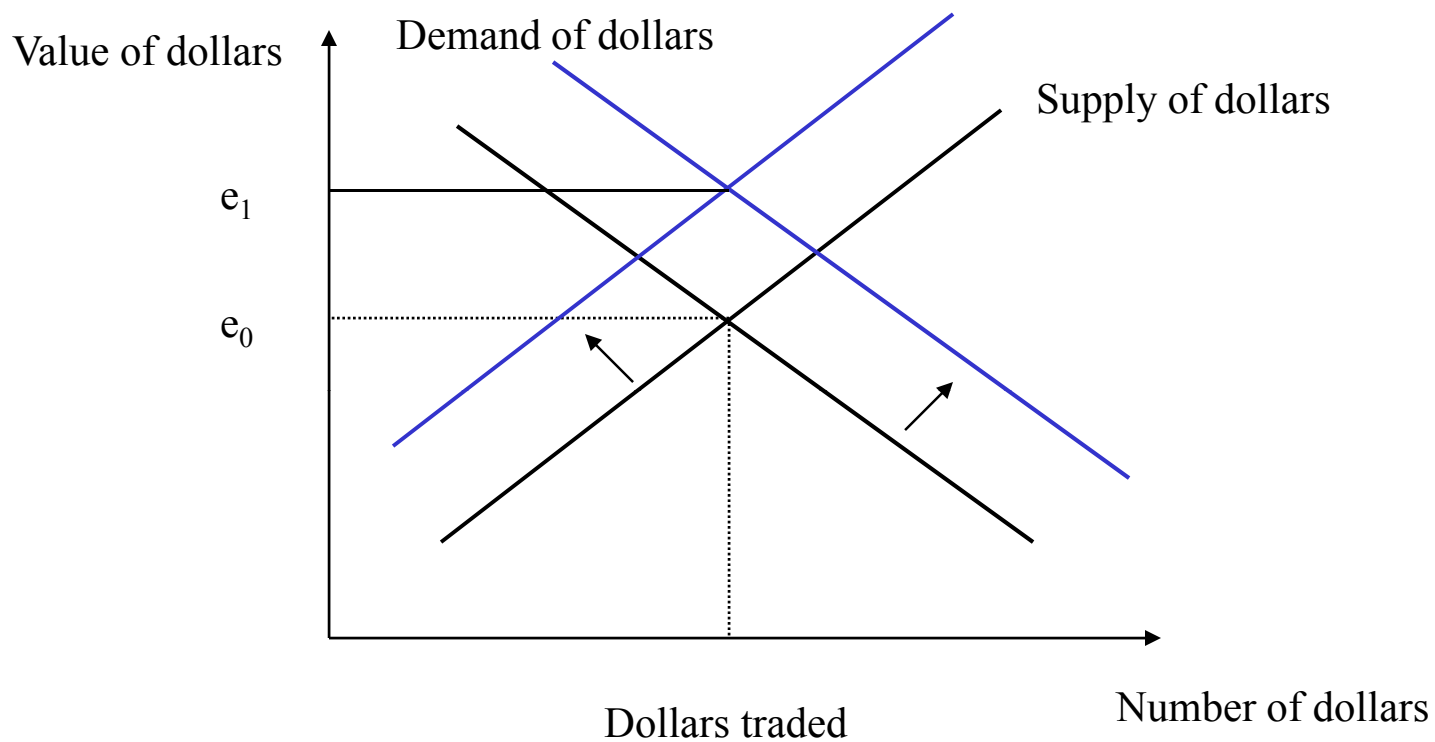
Increase in US real interest rate



American assets are more attractive and

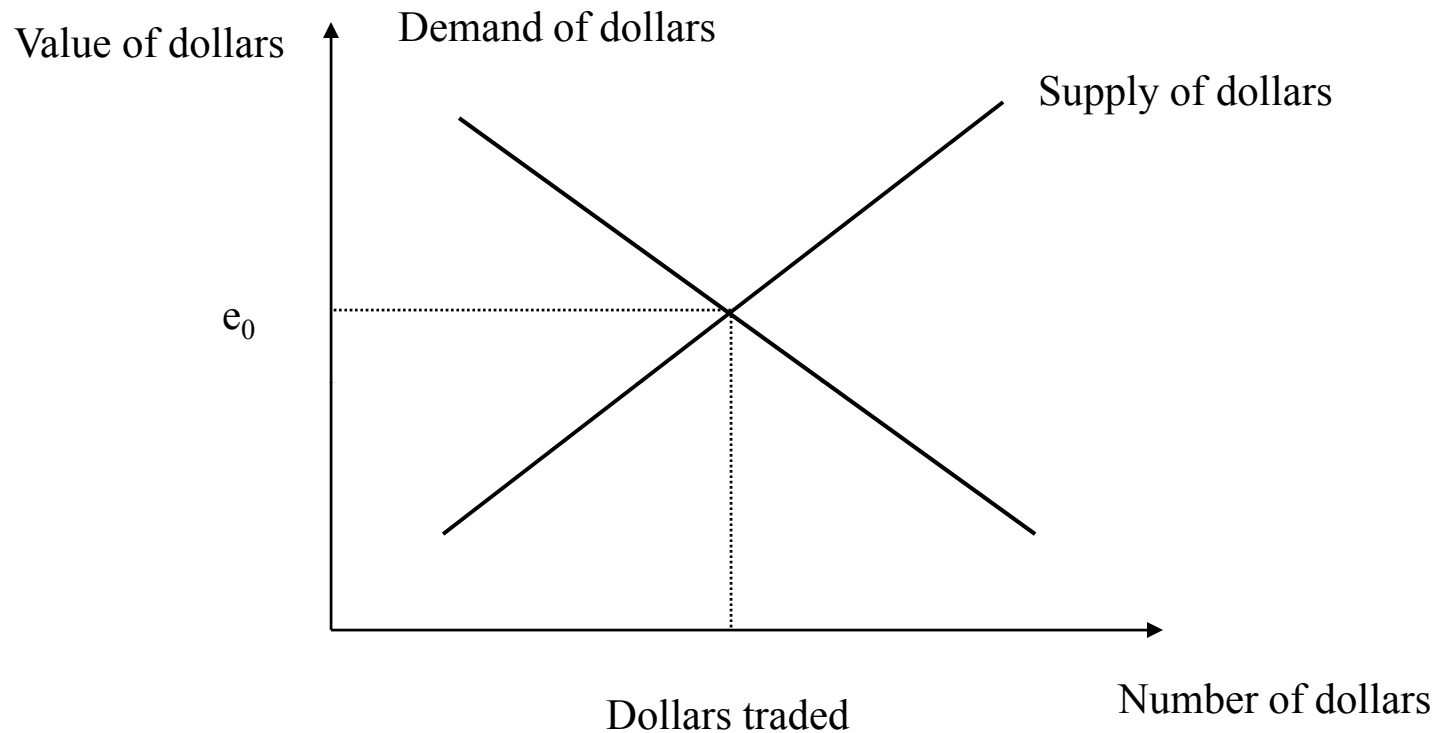
- Japanese need more dollars to invest in them ...
- American need more dollars to invest in them ...

Increase in US real interest rate



The dollar appreciates!

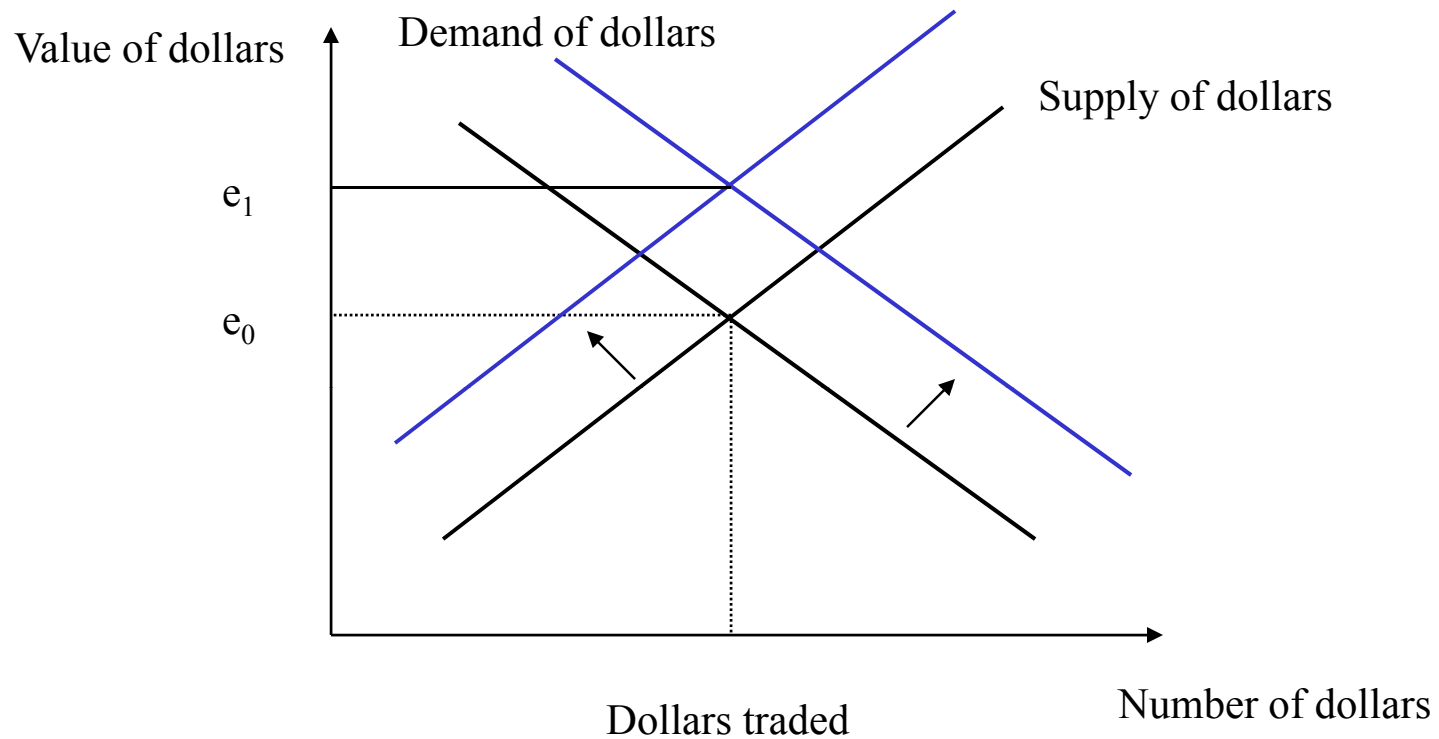
Increase in US prices



1. **If US goods are more expensive**
 - Americans want to buy more Japanese goods
 - Japanese want to buy less US goods
2. **If M/P decreases, the real interest rate increases ...**

Assume that the interest rate effect dominates!

Increase in US prices



Assume that the interest rate effect dominates

The dollar appreciates!

Summing up...

- **GDP:**

1. Increase in US GDP decreases NX and the dollar depreciates
2. Increase in Japanese GDP increases NX and the dollar appreciates

- **Interest rate**

1. Increase in US real interest rate appreciates the dollar
2. Increase in Japanese real interest rate depreciates the dollar

- **Prices:**

1. Increase in US prices decreases NX but increases r , and the dollar may appreciate or depreciate (we assume the first!)
2. Increase in Japanese prices increases NX but increases foreign r and the dollar may appreciate or depreciate (we assume the second!)

Trade Balance

- **Trade balance = NX.**
- If trade balance is positive, we say there is a trade surplus. If trade balance is negative, we say there is a trade deficit.
- When the real exchange rate appreciates, the value of the dollar is higher. Hence, domestic exports are more expensive (for Japanese) and imports are cheaper (for Americans).
- Other things constant, **a real exchange rate appreciation reduces NX**
- In other words, if the dollar appreciates, we would expect the **trade surplus to fall** (trade deficit to rise). If the dollar appreciates, imports will increase and exports will fall.

Current Account

- The current account balance equals payment received from abroad in exchange for currently produced goods and services minus analogous payments made to foreigners by the domestic economy
- Three components:
 - 1) net exports of goods and services
 - 2) net income from abroad (mainly interest payments on net asset positions)
 - 3) net unilateral transfers
- When a current account balance is negative (as in the US since 1980s), US receipts of payment from foreigners are not sufficient to cover US payments to foreigners
- Hence, US has to borrow from foreigners or sell to foreigners some US assets

Global Imbalances

- Current Account is equal to $NX + \text{other stuff}$
- Usually other stuff is relatively small so use $CA \approx NX$
- Crucial identity: trade in assets compensates for trade in goods
- If we buy more foreign goods than we sell, we must sell more assets than we buy
- United States: current CA deficit about 4% of GDP
- **Always 2 sides of a CA deficit: a portfolio side and an import/export side!**

Global Imbalances

Net exports of goods and services: Percentage Shares of Gross Domestic



Are Global Imbalances to Blame?

- **One story:**
- Emerging economies want to accumulate safe assets:
 1. Demographics/Lack of Social Insurance
 2. Protection for capital flights
- They buy US Treasuries (CA deficit increases) pushing down interest rates
- **Banks search for yield: increase demand for AAA-rated assets with higher returns (MBS,...)**
- This sowed the seeds for the current crisis
- Bernanke recognized the imbalances in 2005 (but not the crisis unfortunately!)

Low saving rates before the crisis

In the 4 years before the crisis, the US has experienced *low interest rates* and *low savings*.

What explains this?

- a. Can the negative wealth effect of the **stock market** crash explain this?
- b. Can the positive wealth effect of the **real estate boom** explain this?
- c. What about **China**???
- d. What about the **Fed** ? ...

Was it the stock market crash or real estate boom?

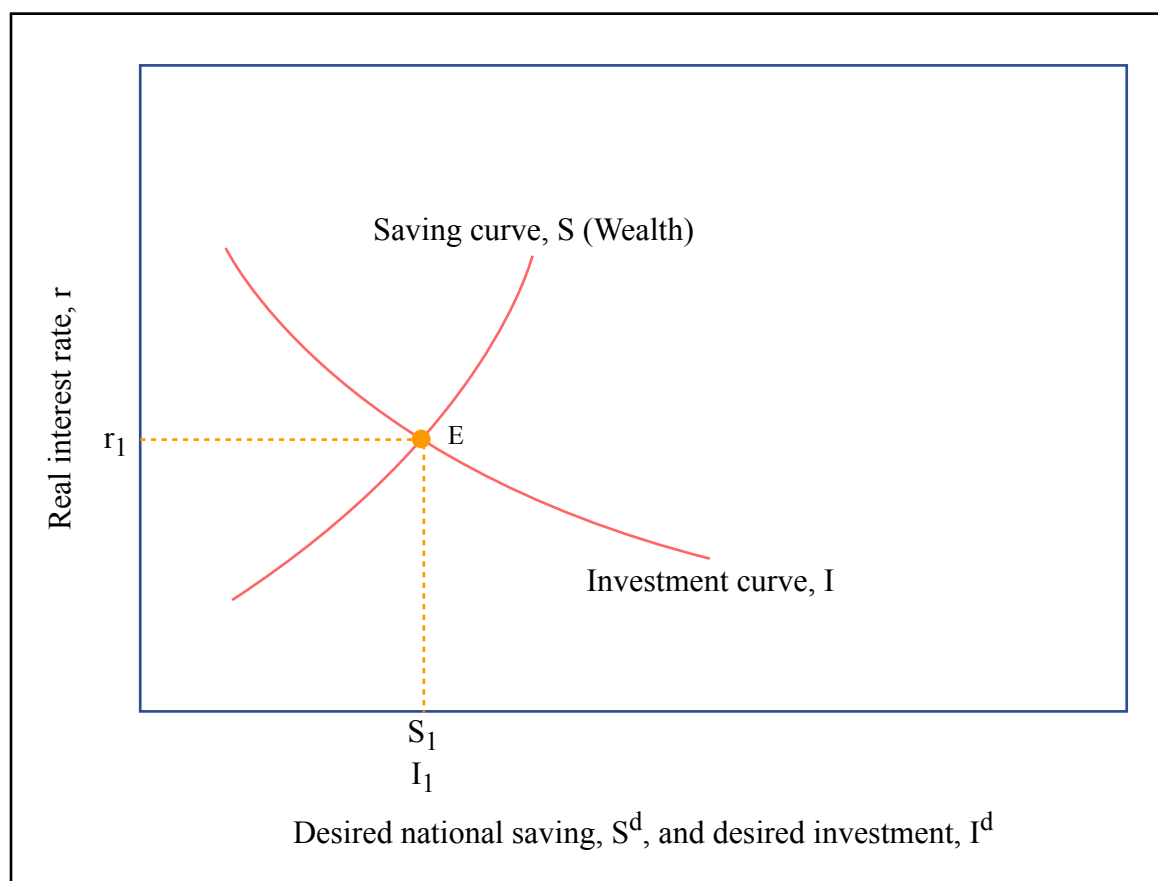


Figure by MIT OpenCourseWare.

Two large Open Economies work just like a closed economy: The role of China in low world interest rates

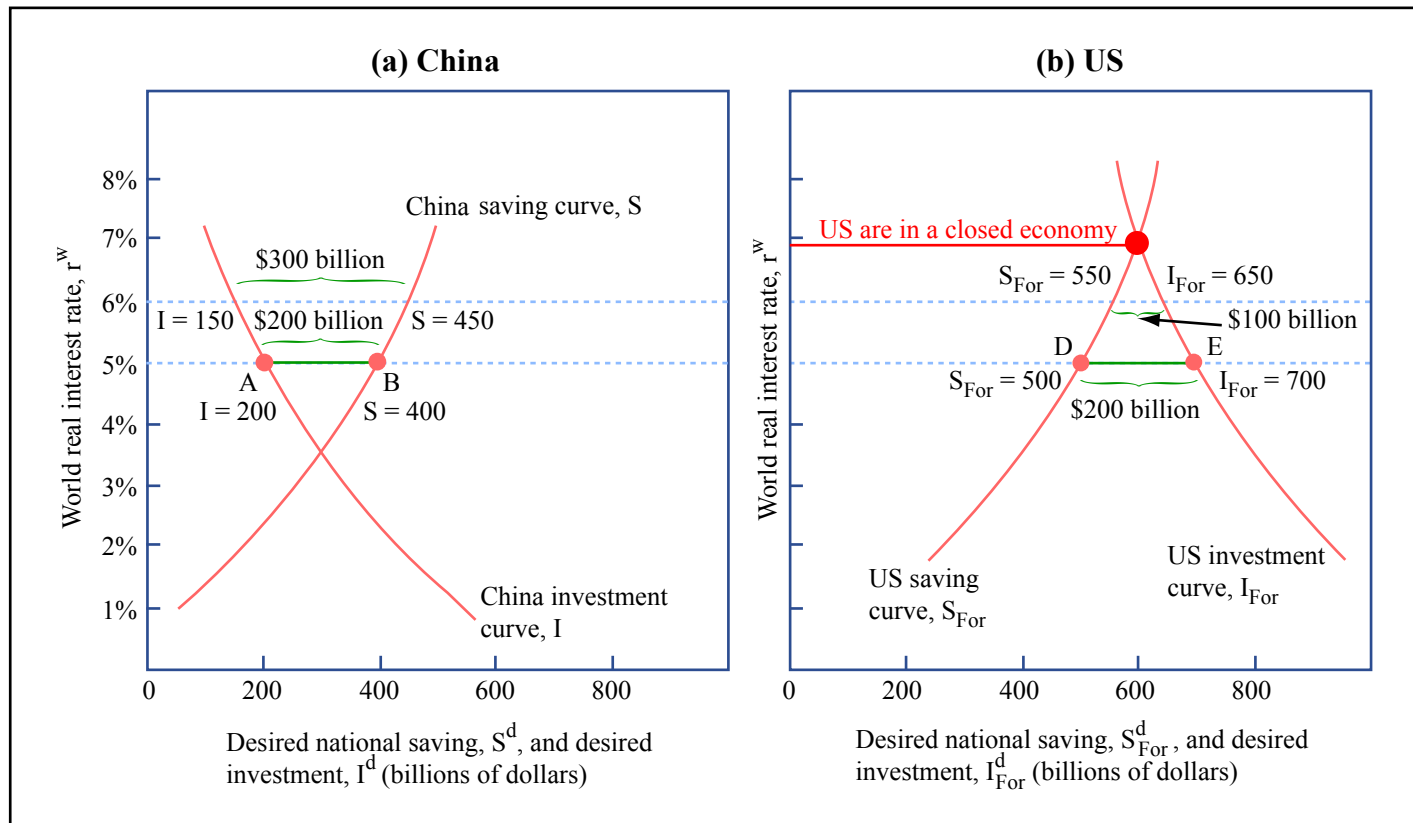


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Two views (and my comments)

1. **Sachs: who really made interest rates low is the Fed, not Asian countries, so the Fed is to blame**

BUT

- but the Fed objective is to keep $Y=Y^*$ if there is no inflation
- So the Fed was right to **keep r low if NX drops!**

2. **Krugman: the problem of the story is that bankers are greedy**

BUT

- if there is limited supply of safe assets and demand increases the market (the banks) is just **responding to this scarcity by “creating” more safe assets** (Caballero)
- Housing usually is pretty safe...
- So the underlying forces are going to stay with us even after the crisis!

Open-Economy IS-LM Model

- LM not affected
- FE not affected
- **IS affected by NX!! Still downward sloping: as r increases, e appreciates and NX decreases!**
- Remember: in an open economy, the good market equilibrium is now

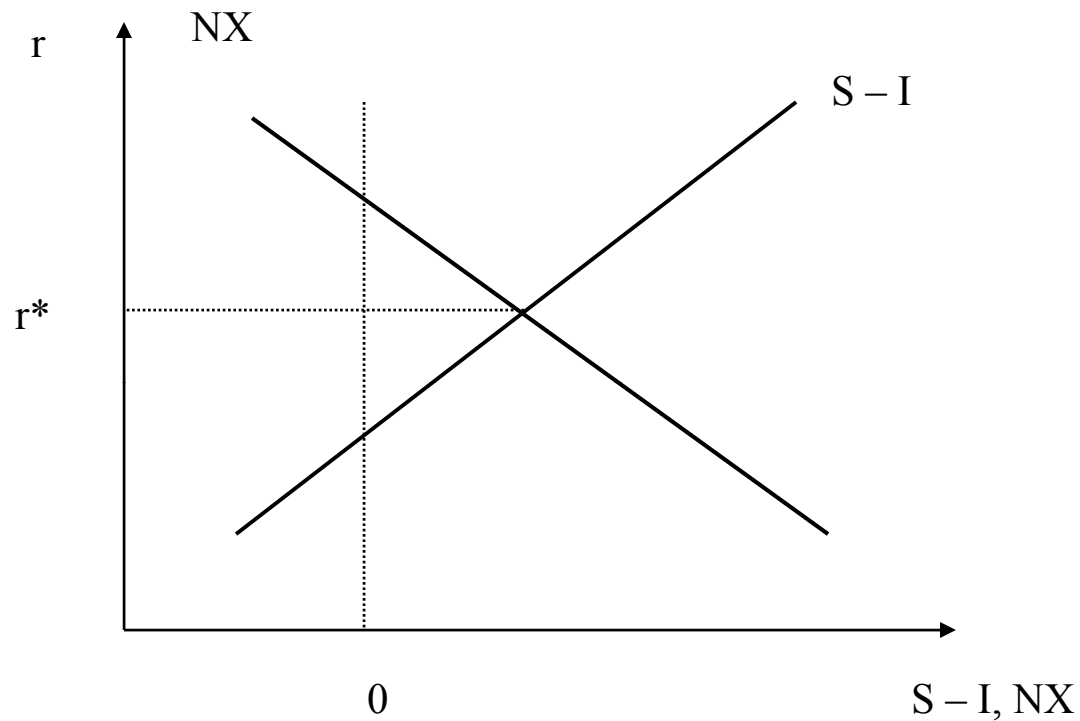
$$Y = C + I + G + NX$$

or

$$S - I = NX$$

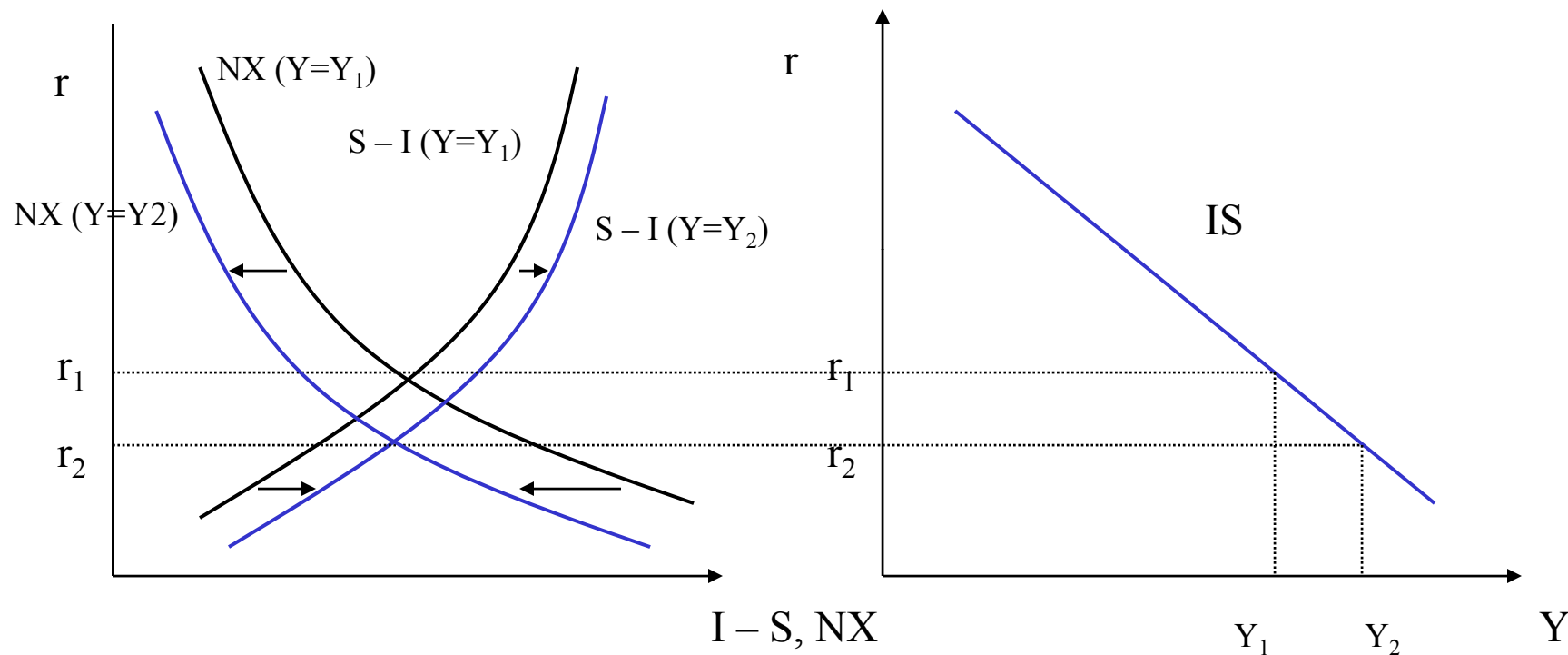
- The excess of national savings over investment is the amount US residents want to lend abroad and net export is the amount that foreigners (Japanese) want to borrow from US.

Good Market Equilibrium



1. **$S - I$ is upward-sloping** because an increase in r increases S and reduces I
2. **NX is downward-sloping** because an increase in r appreciates the dollar and reduces NX

Open market IS curve



An increase in US GDP

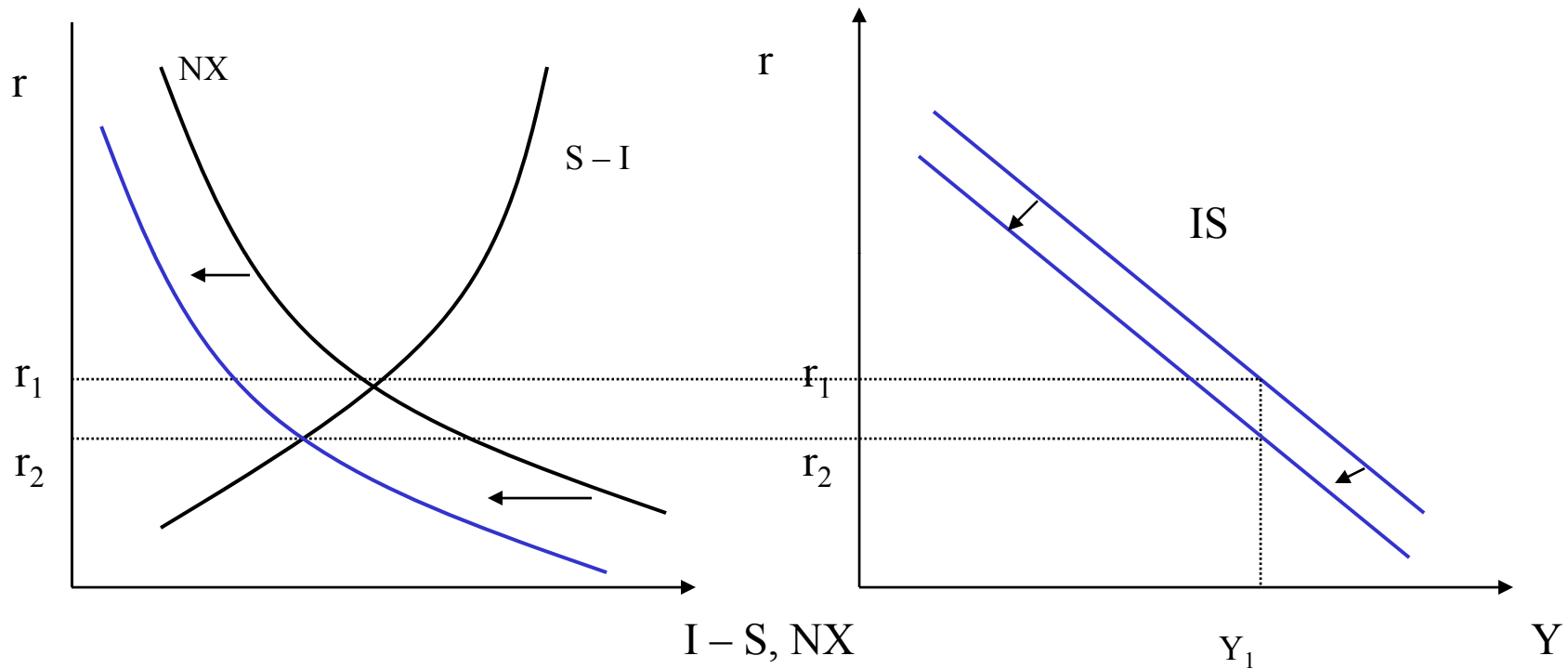
1. Increases S and does not affect I
2. Decreases NX

Factors that shift the IS curve

The IS curve shifts to the **right** because of:

- Any factor that shifts the **closed economy IS** curve
- Anything that **raises NX**, given Y and r :
 1. an increase in foreign GDP
 2. An increase in foreign interest rate
 3. A shift in the world demand towards the US goods

Example: a decrease in Japanese GDP



The interest rate decreases and the dollar depreciates

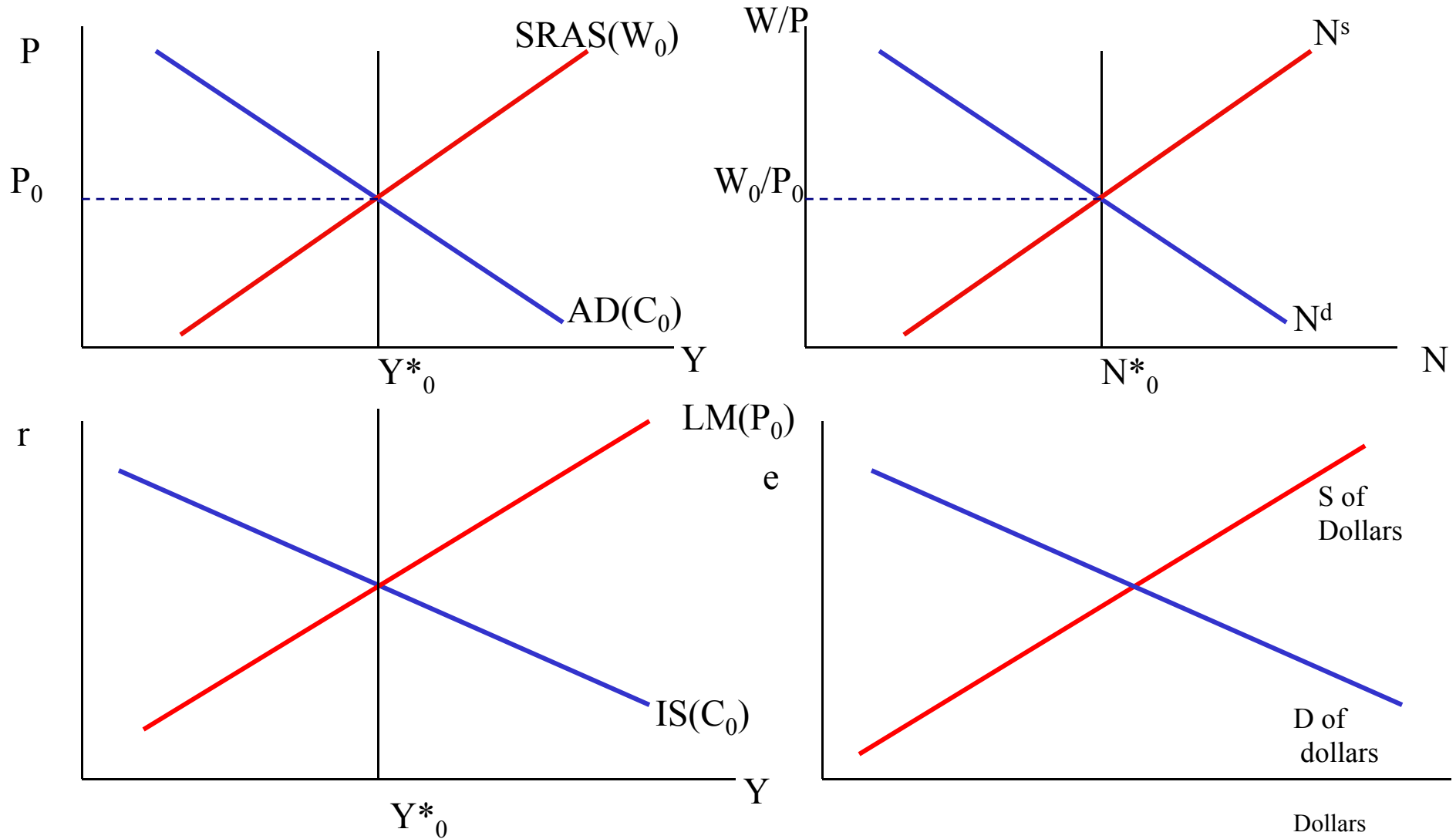
International Transmission of the Business Cycle

- **The impact of foreign economic conditions on the real exchange rate and NX** is one of the principal reason why cycles are transmitted internationally
- Imagine US is the major importer from Japan
- If US is in recession, Japan net export decrease and a negative demand shock can generate a recession!
- Similarly, a change in world taste for Japanese goods, can generate a recession in Japan!
- Let's see now the effect of **fiscal and monetary policies when US is an open economy ...**

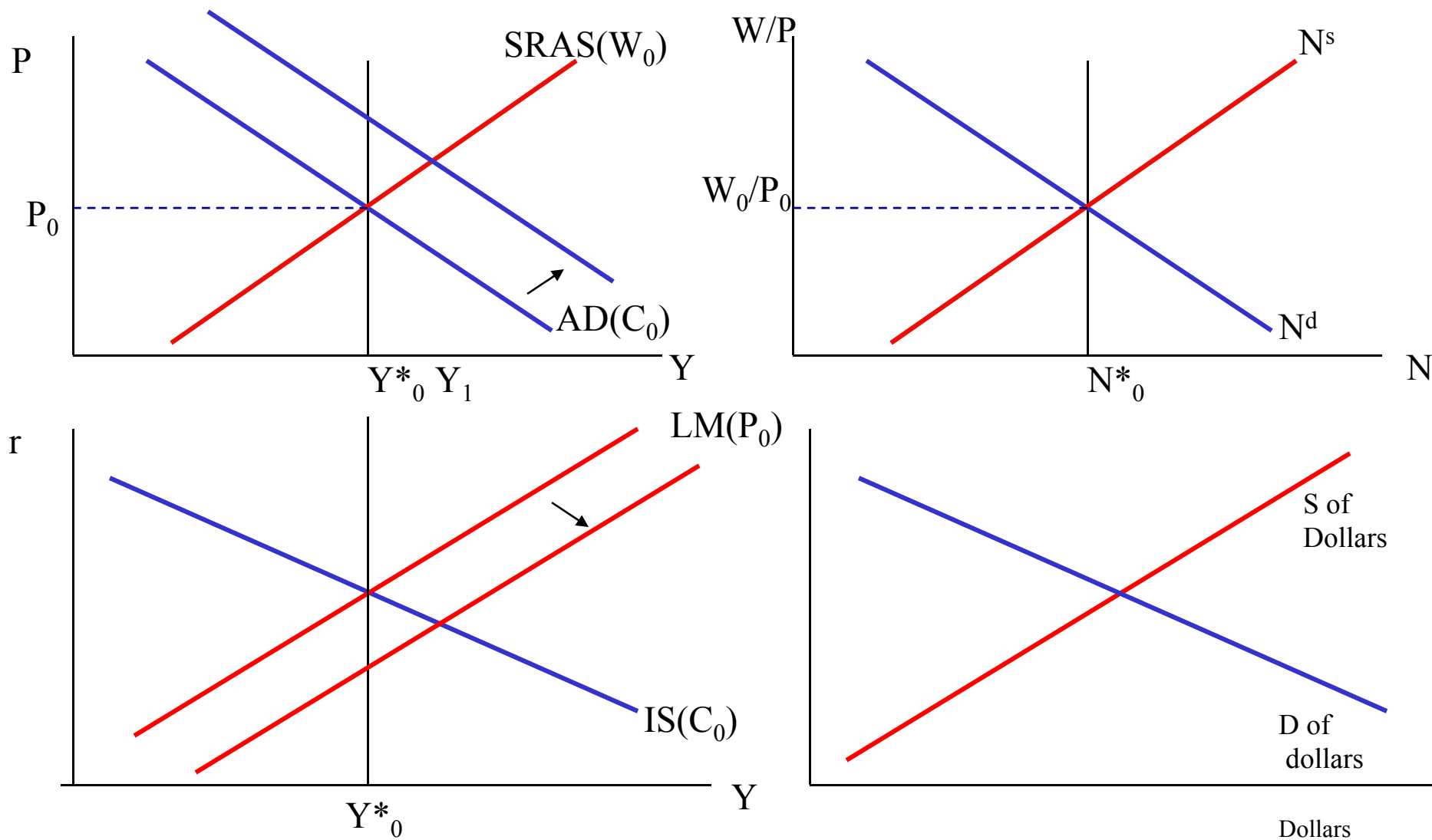
Monetary Policy in Open Economy

- **Suppose the Fed cut the federal fund rate.**
- Real money supply increases
- The monetary policy decreases real interest rate and stimulates investment (AD shifts! Movement along the IS)
- Labor Market is Not affected
- Exchange Rate ...

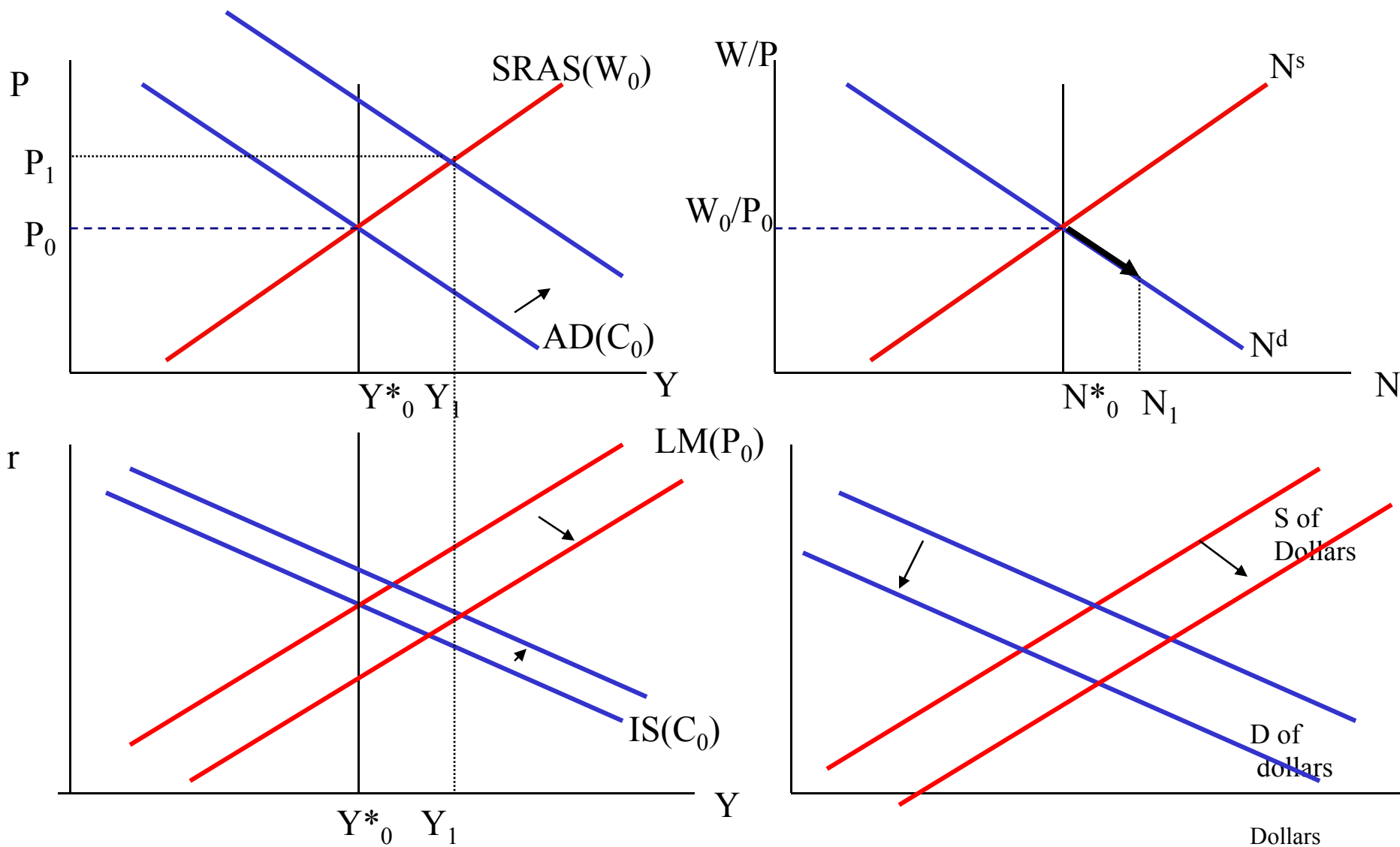
Monetary Policy in Open Economy



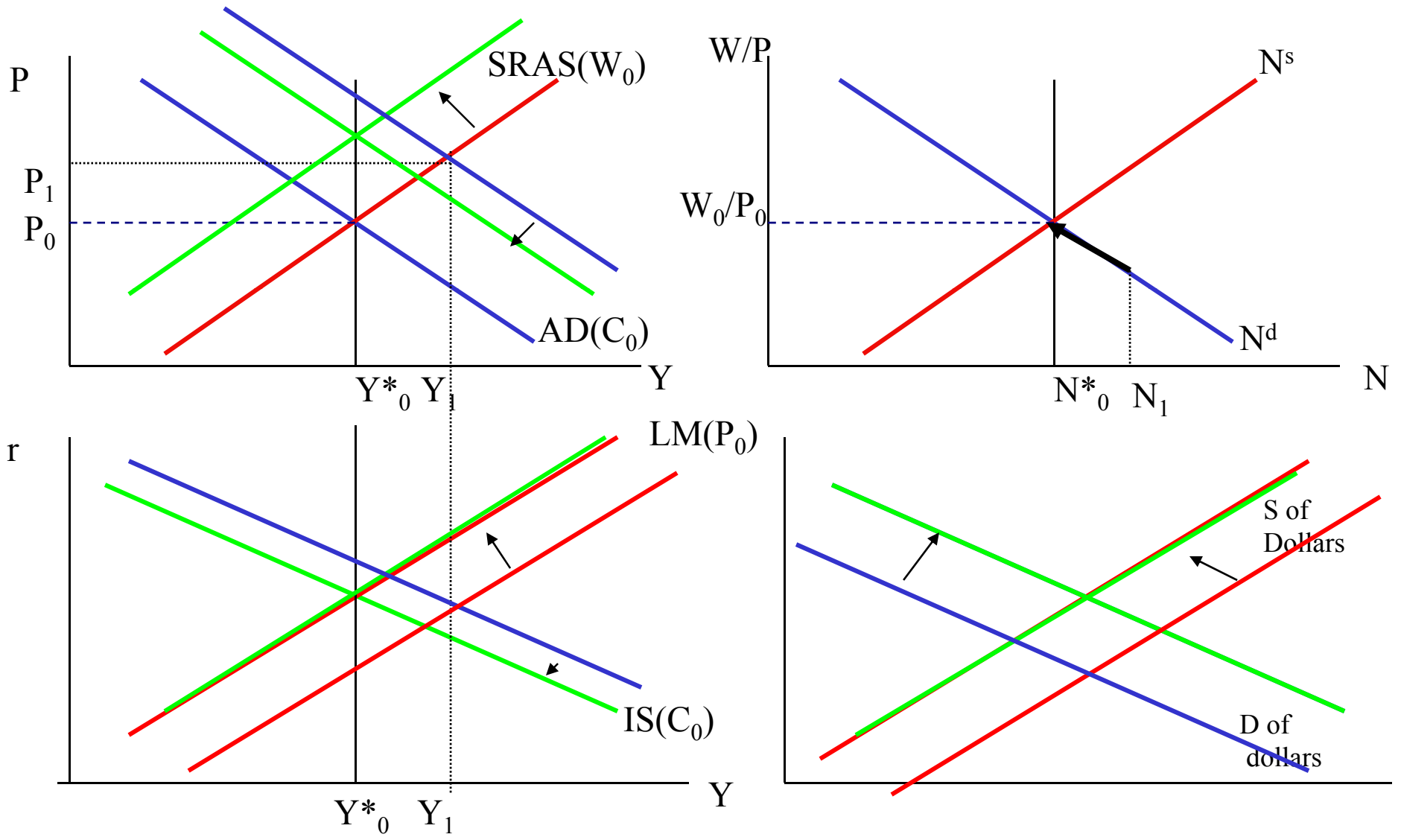
Monetary Policy in Open Economy: Short Run I



Monetary Policy in Open Economy: Short Run II



Monetary Policy in Open Economy: Long Run



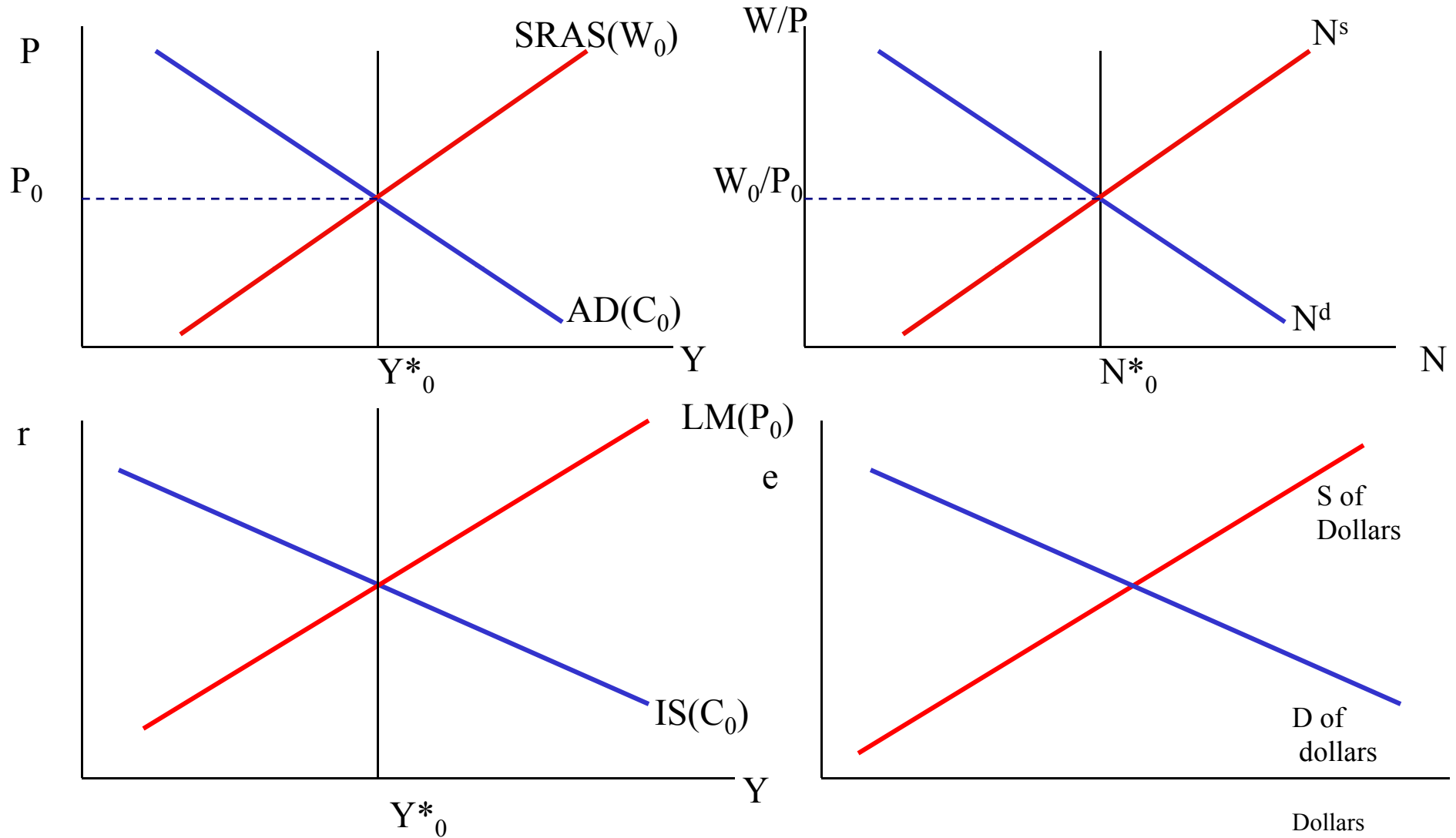
Monetary Policy in Open Economy

- With an expansionary monetary policy, **r decreases and P and Y increases**. All of these increase the supply for dollars and decrease the demand for dollars
- **The dollar depreciates!**
- Dollar depreciation decreases imports and increase exports (NX increase)
- In an open economy, AD will shift out further than it does in a closed economy (because of I and NX!) + the IS shifts to the right!
- In the short run, the monetary policy is **more effective** in an open economy.
- **In the long run, money is still neutral!!!**

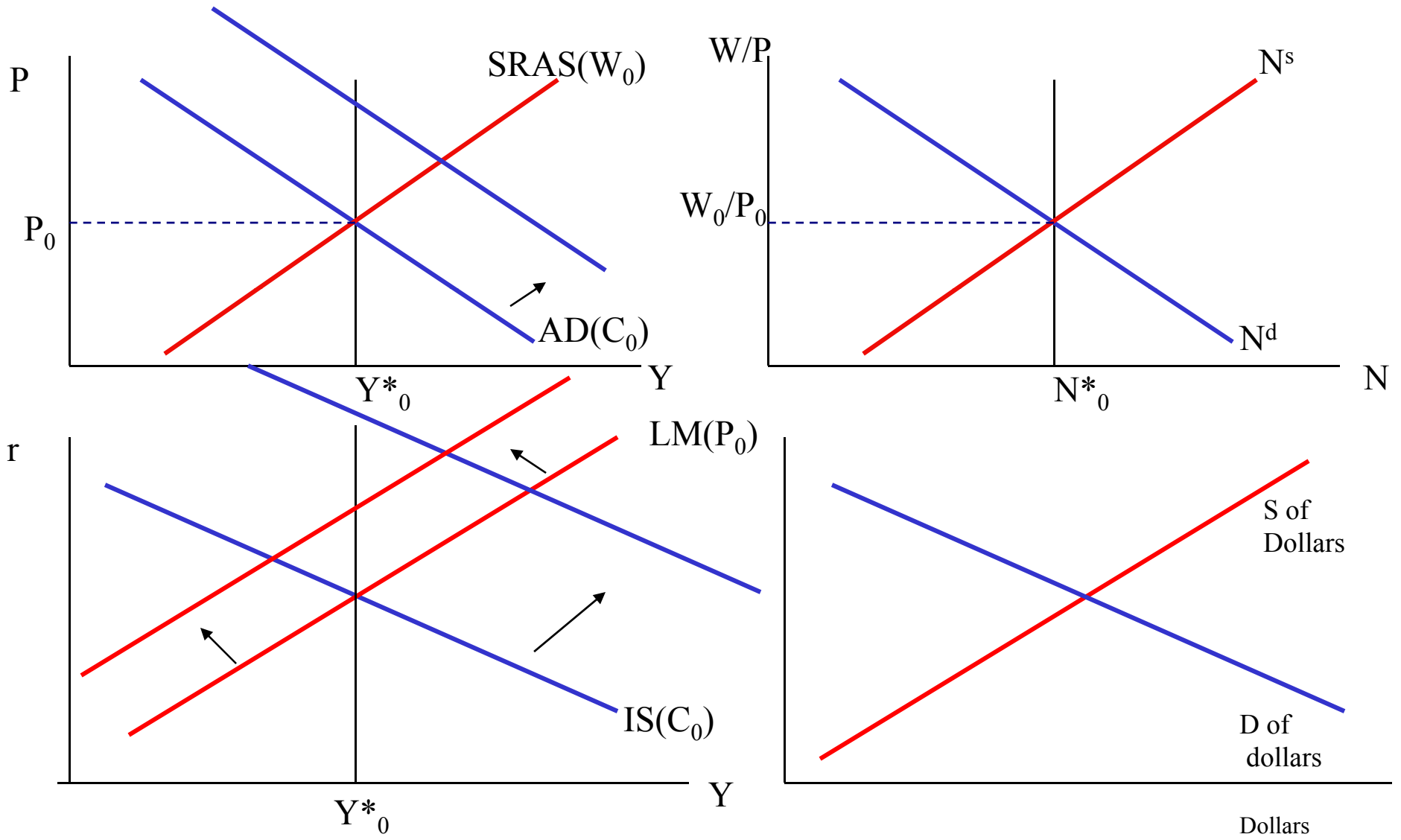
Fiscal Policy in Open Economy

- Suppose the US government increases G or decreases T . How will this affect goods market, money market, labor market and **exchange rate market**?
- G increases, hence demand for goods increases
- Demand for goods increases and firms rise prices and real money supply decreases (+ money demand increases), increasing the interest rate
- Labor Market is Not affected (Assume that agents are not-Ricardian and do not predict any change in their PVLR)
- Exchange Rate ...

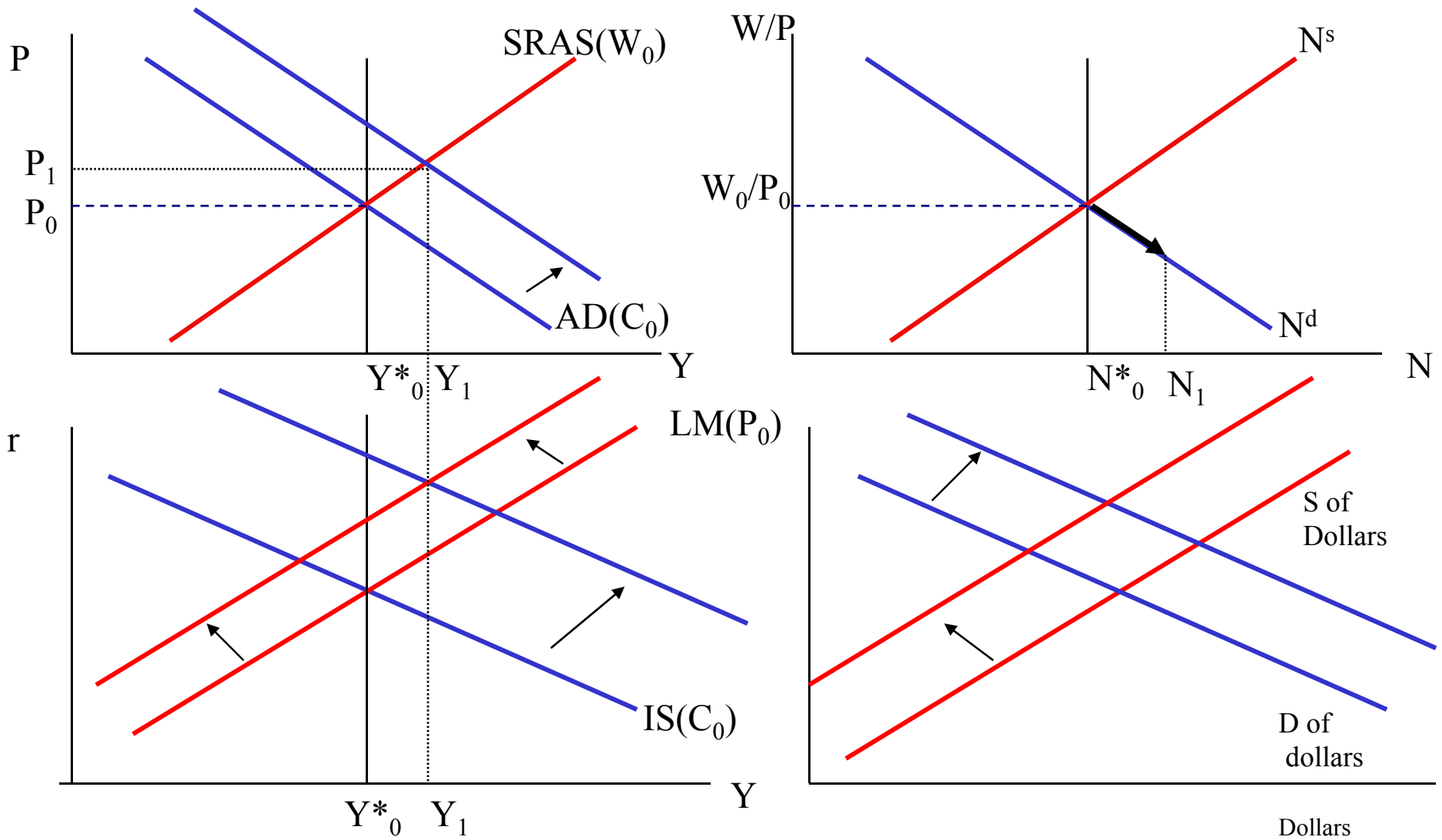
Fiscal Policy in Open Economy



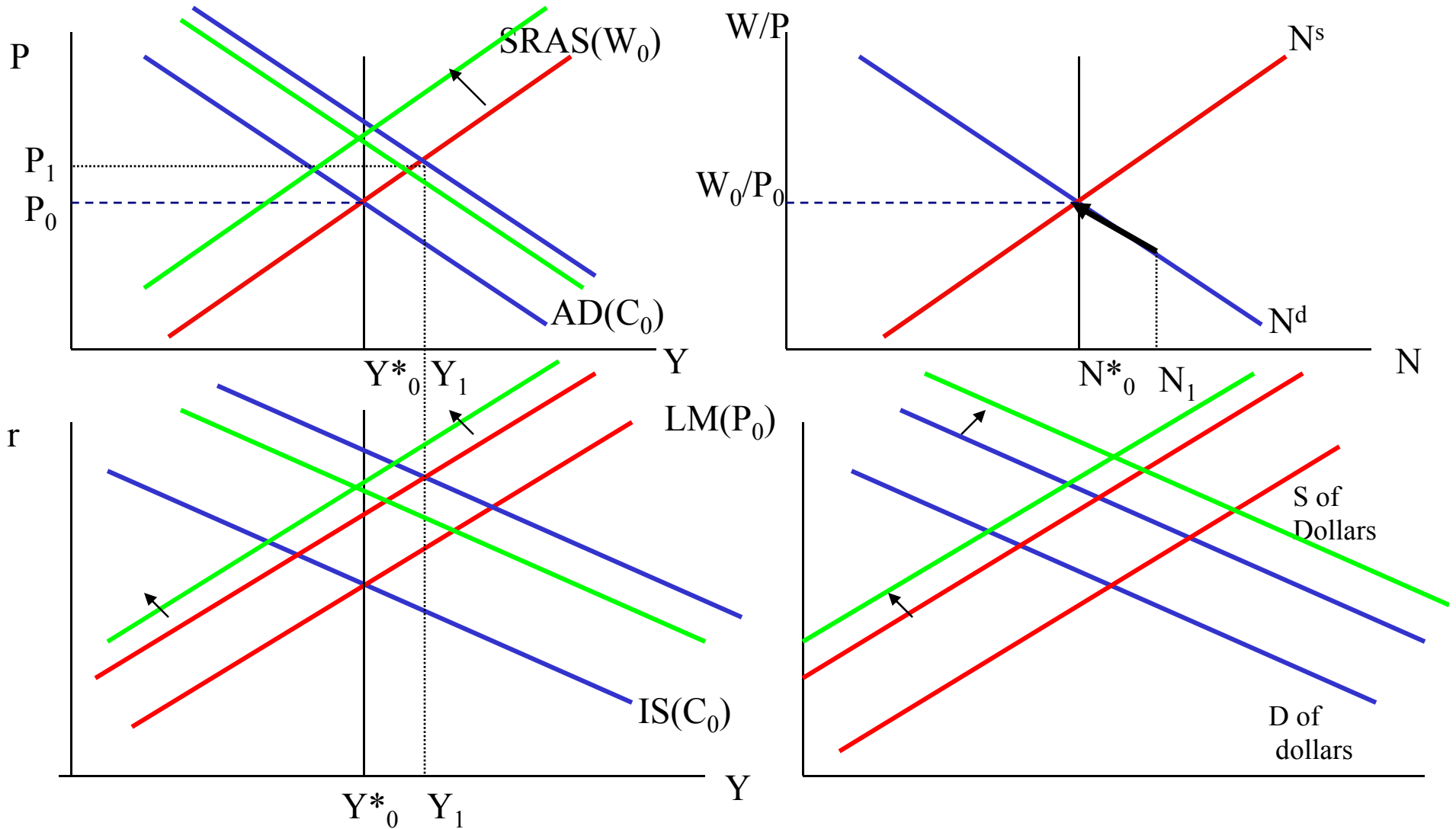
Fiscal Policy in Open Economy: Short Run I



Fiscal Policy in Open Economy: Short Run II



Fiscal Policy in Open Economy: Long Run



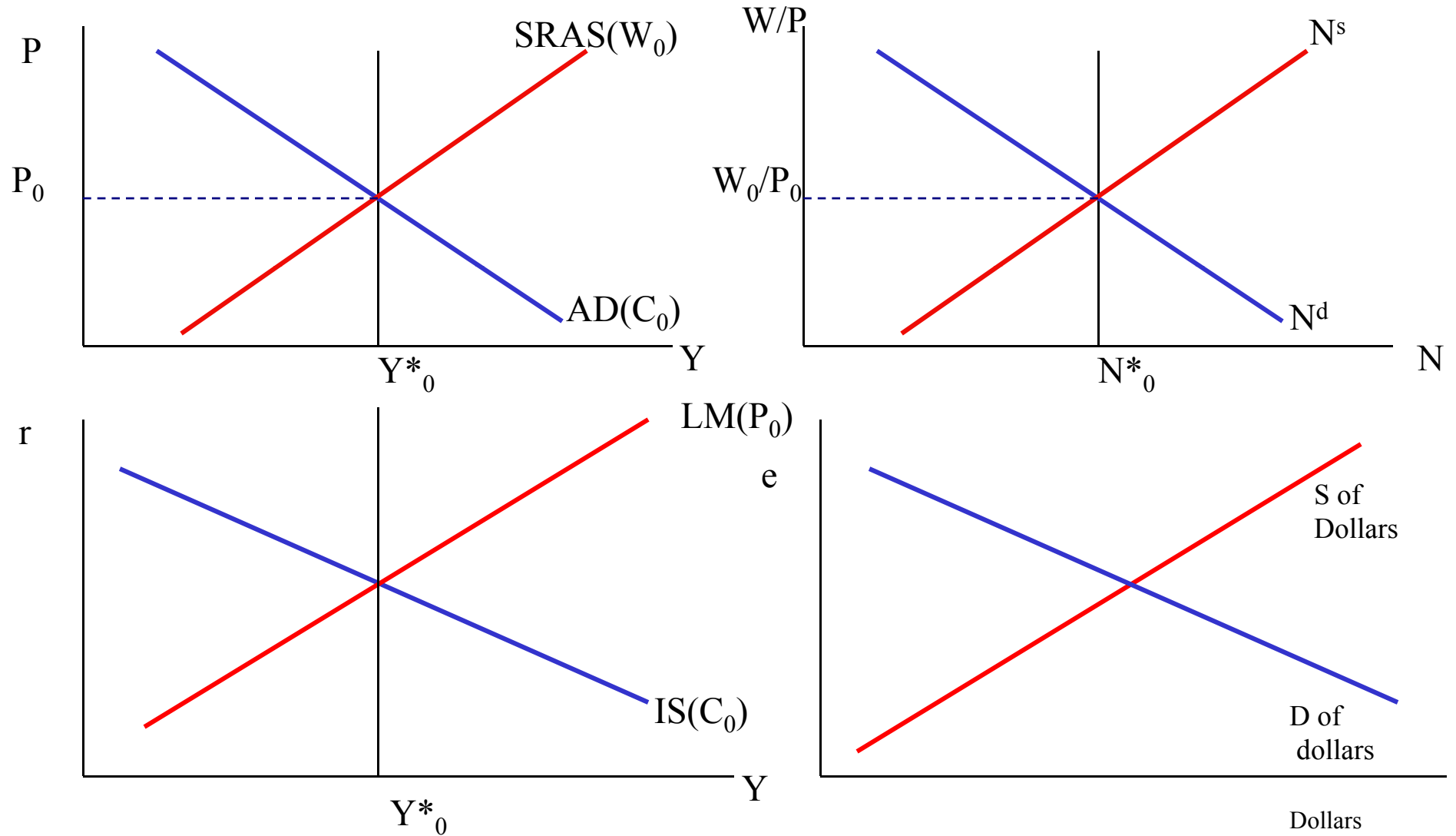
International Crowding out

- **Exchange rate effect: Ambiguous!**
 1. Increase in Y and P tend to decrease NX and depreciates the dollar
 2. Rise in r tend to appreciate the dollar
- Which one dominates? It depends on the size of the changes. But, often the interest rate effect dominates.
- **If the interest rate effect dominates, the dollar appreciates, and NX will unambiguously decrease!**
- **International crowding out** : in an open economy, the increase in imports crowds out some of the effects of expansionary fiscal policy.
- **Hence, the fiscal policy is less effective in the short run!**

If Monetary Policy accomadates...

- The international crowding out effect is based on increase in r ...
- **If the Fed keeps the interest rate fixed (as now!), there is no such effect**
- In fact, there is a multiplier effect as if there was only a monetary policy
- If r stays fixed, an increase in Y and P tend to depreciate the dollar
- This pushes NX up, hence shifting the AD further to the right!

Fiscal and Monetary Policy



What Should We Have Learned

- What is the **nominal and the real exchange rate**
- When we think about an open economy we have to think about an extra market: the **exchange rate market**
- An appreciation of the exchange rate tend to reduce NX
- What is the impact of a change in Y , r and P on the exchange rate and NX
- Open-economy IS-LM and AD-AS models (assume the interest effect dominates!)
- **Fiscal policy less effective** because of International crowding out (Twin deficits)
- **Monetary policy more effective!**

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