Economics 2
Fall 2024

Emmanuel Saez

LECTURE 20

International Macroeconomics

I. Overview of International Macroeconomics

Issues in International Macro

- What determines exchange rates between currencies?
- The balance of payments and its implications.
- What determines net exports? NX=exports-imports
  - Net exports (NX) are a component of planned aggregate expenditures.
  - $PAE = C + I^p + G + NX$
  - So changes in NX will affect Y in the short run.

II. Supply and Demand Framework for Exchange Rate Determination

Exchange Rate

- The price of one currency in terms of another.
- It currently takes .95 euros to buy 1 U.S. dollar.
    - The price of $1 is €.95

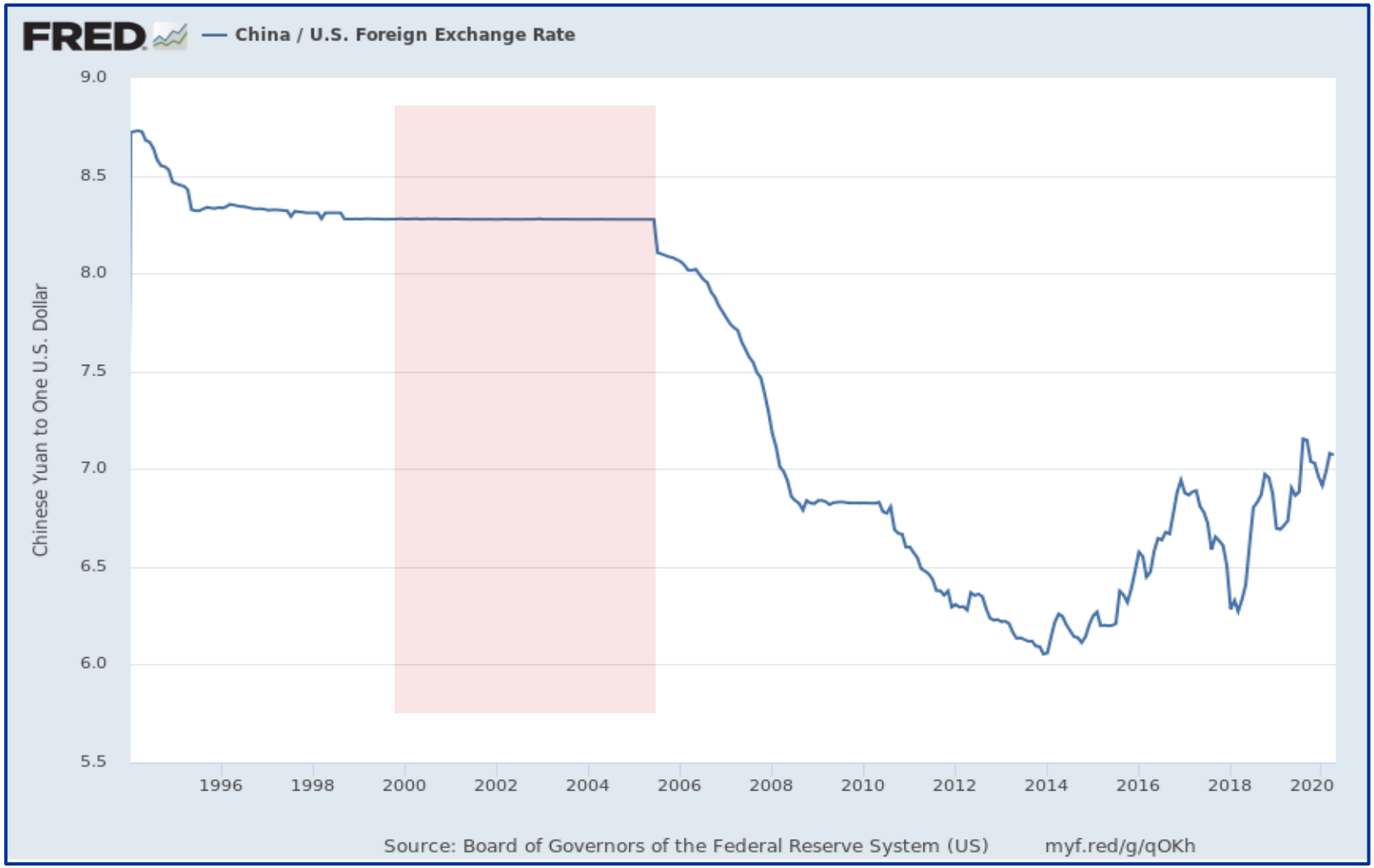
Foreign Exchange Market for Dollars

- Demanders of dollars: Foreigners who want to buy American goods, services, or assets. They need to convert their currency in $ to buy American
- Suppliers of dollars: Americans who want to buy foreign goods, services, or assets. You need to convert your $ into foreign currency to buy foreign
- The exchange rate is the price of dollars (in terms of some foreign currency) that equilibrates the supply and demand for dollars to be used in international transactions.

Some Facts about Foreign Exchange Markets

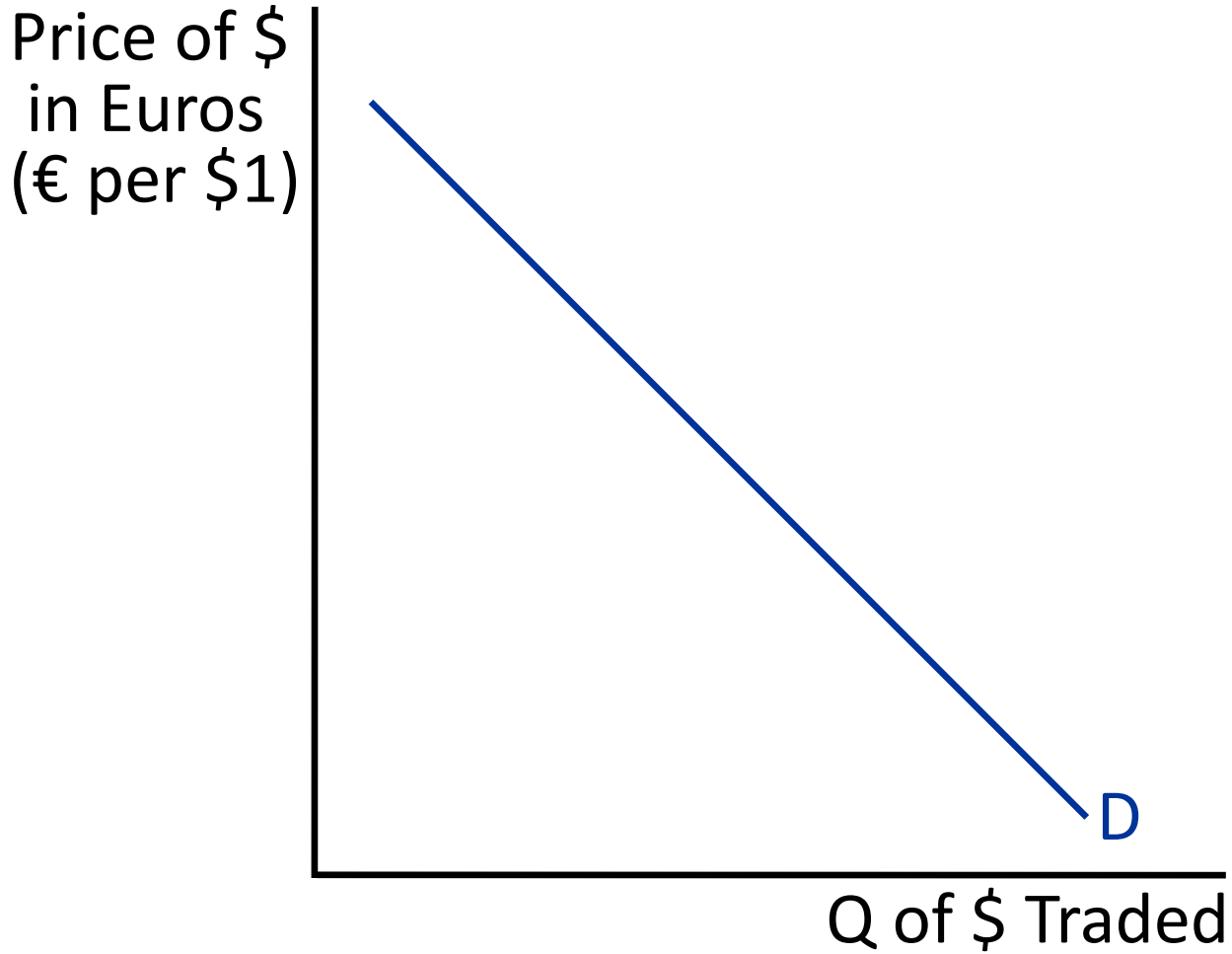
- There is a market for each currency to be traded for every other currency.
    - However, the various markets for a particular currency (such as the $) often move together.
- Today, most exchange rates are determined in markets (flexible exchange rates).
    - But, some countries today and many countries in the past used a system of fixed exchange rates. Done through central bank who buys/sells foreign reserves.

Chinese Yuan per 1 US $



China had a fixed exchange rate with the $ in 1999-2005 but now has a floating exchange rate.

Foreign Exchange Market for Dollars: Demand for Dollars

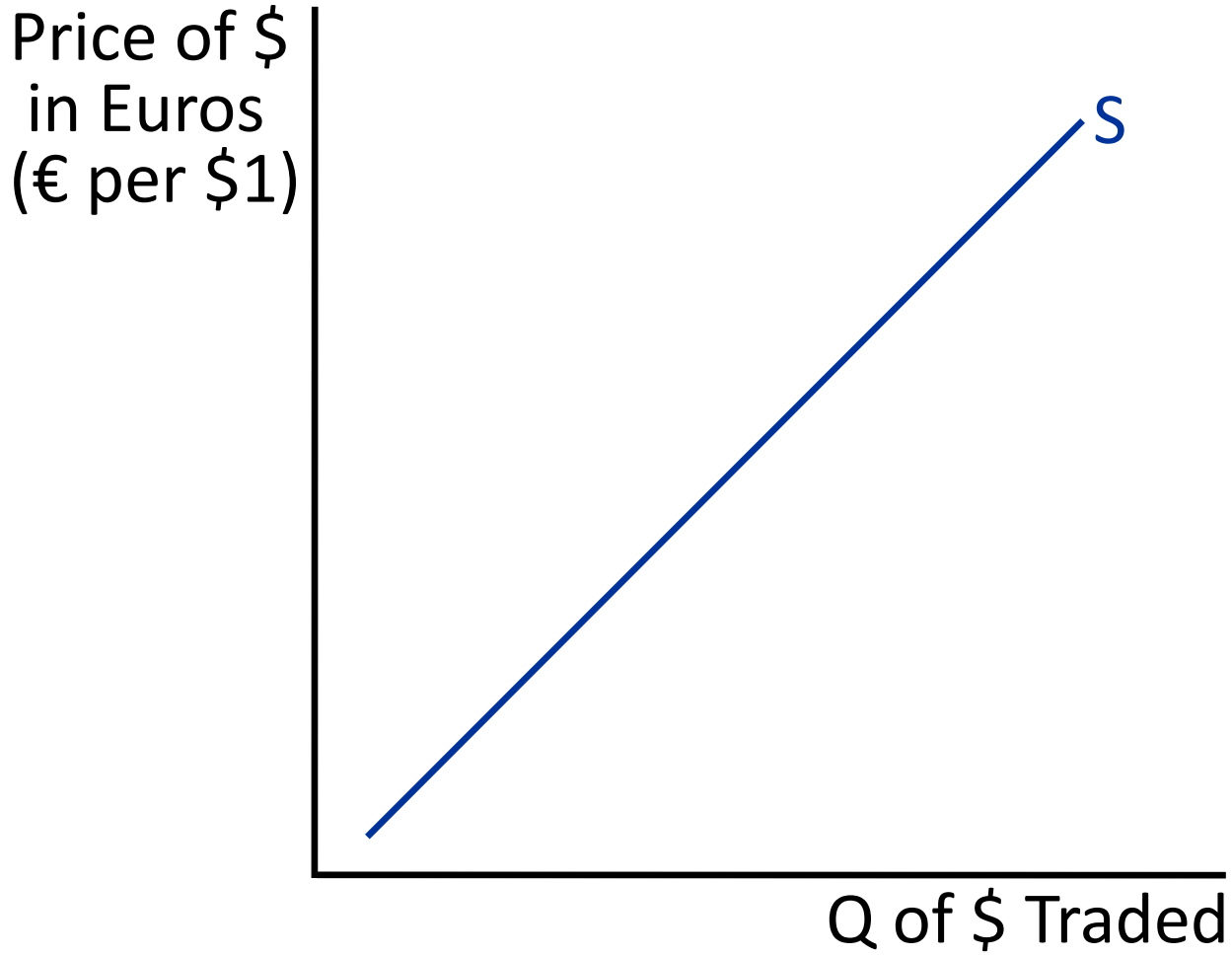


Demand for dollars in foreign exchange market: Foreigners who want to buy American goods, services, or assets. They buy American a lot when $ is cheap

Why Does the Demand Curve for Dollars To Be Used in International Transactions Slope Down?

- If the price of the dollar falls, American goods and services look more attractive (cheaper) to foreigners.
- Foreigners want to buy more goods and services from the U.S.
- As a result, they demand more dollars in the foreign exchange market (convert more of their currency into $ to buy American)

Foreign Exchange Market for Dollars: Supply of Dollars

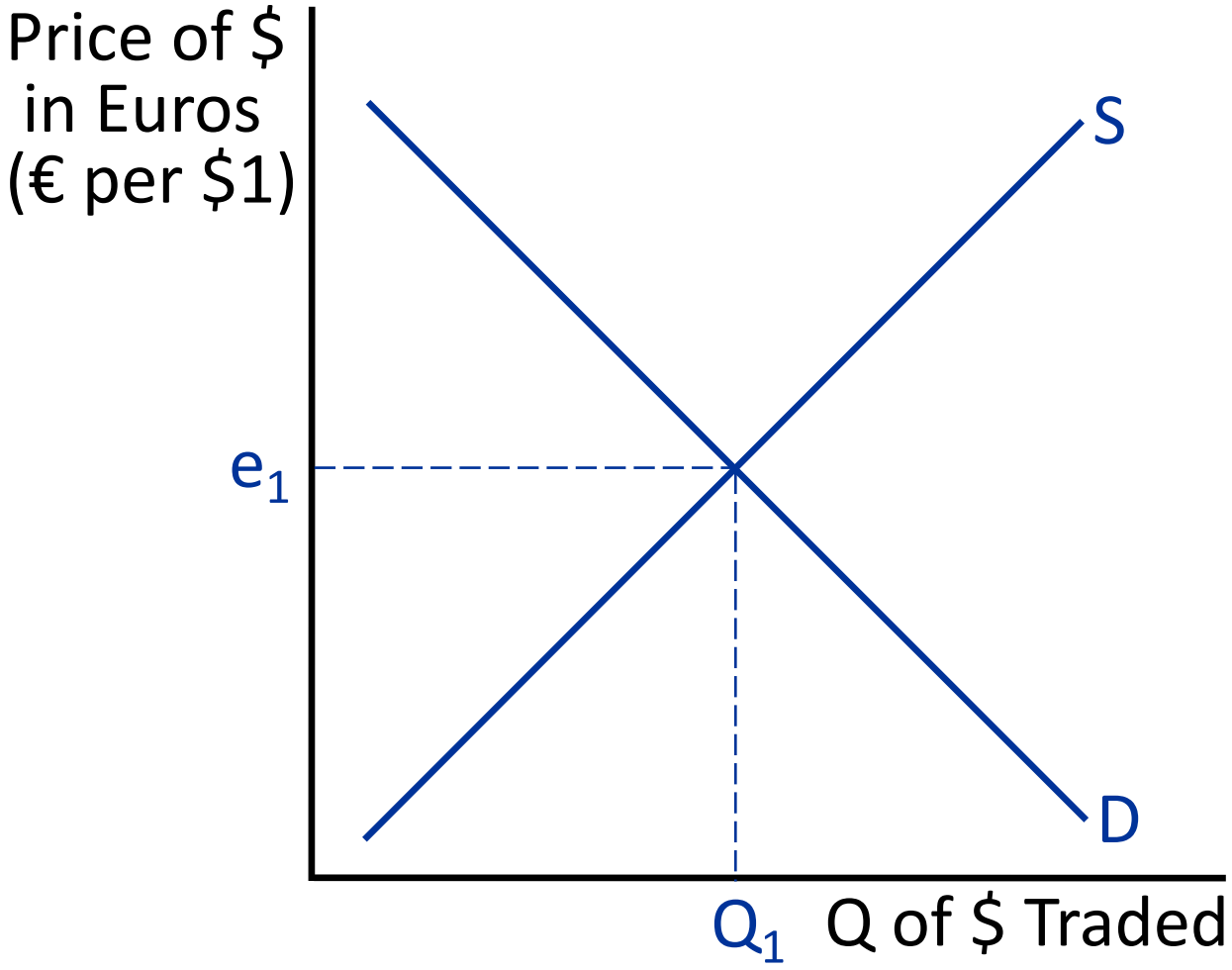


Supply of dollars in foreign exchange market : Americans who want to buy foreign goods, services, or assets. They buy more when € is cheap in $

Why Does the Supply Curve for Dollars To Be Used in International Transactions Slope Up?

- If the price of the dollar rises, foreign goods and services look more attractive (cheaper) to Americans.
- Americans want to buy more goods and services from abroad.
- As a result, Americans supply more dollars to the foreign exchange market. They convert dollars into foreign currency.

Foreign Exchange Market for Dollars

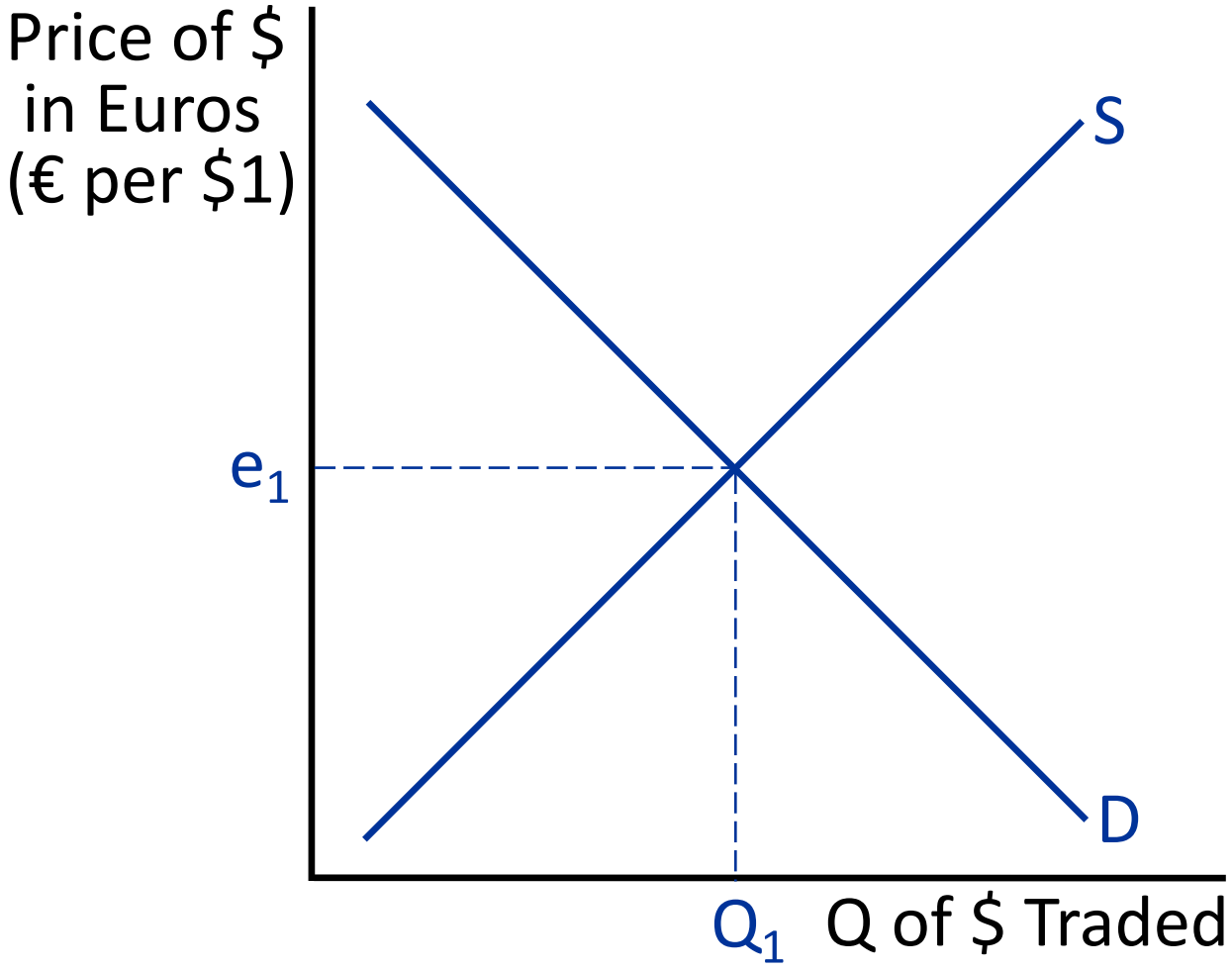


III. What Moves the Exchange Rate?

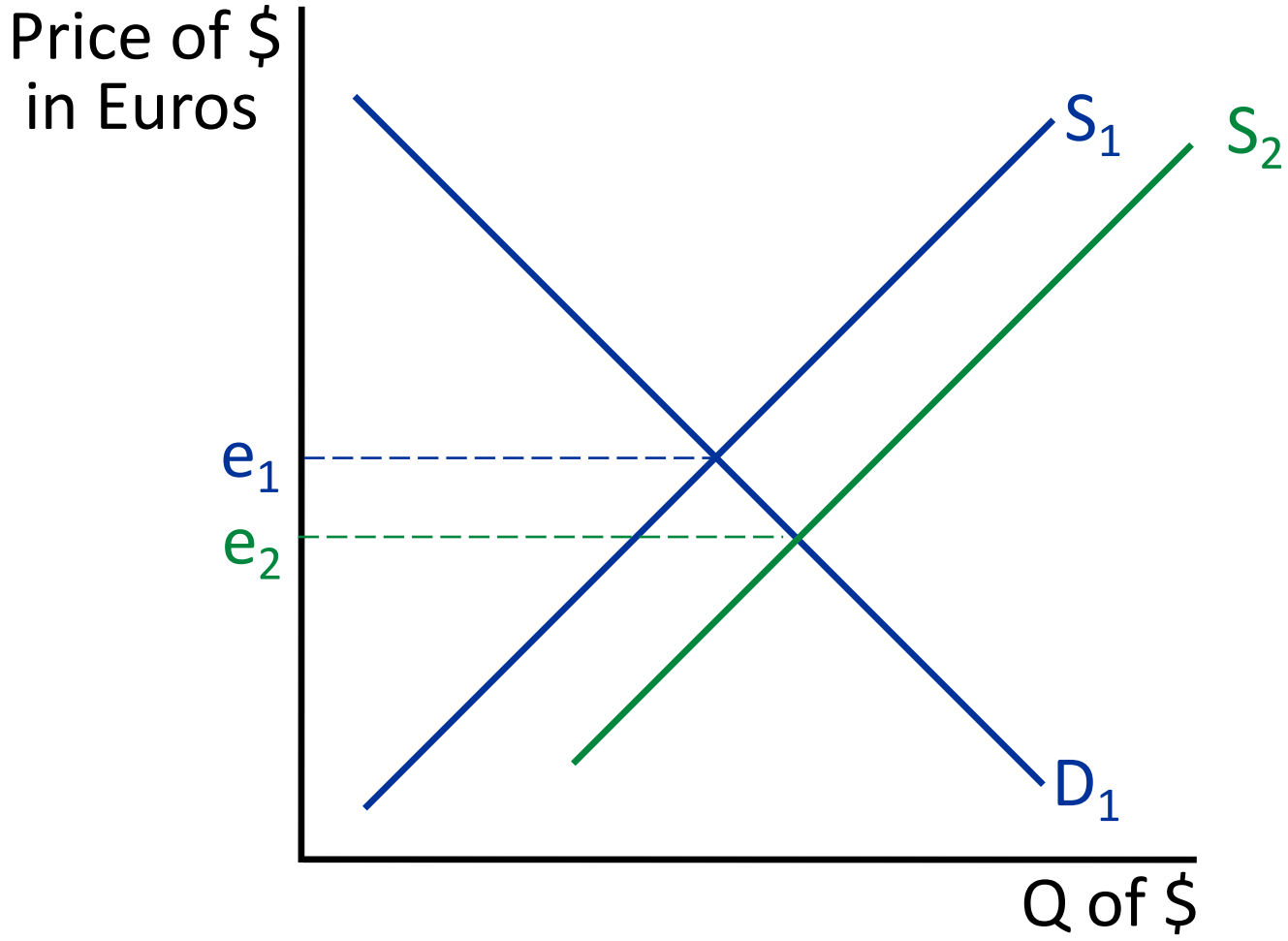
A shift in the supply curve or the demand curve for dollars in the foreign exchange market will cause the exchange rate to change.

- Appreciation of the dollar: The price of the dollar in some foreign currency rises.
- Depreciation of the dollar: The price of the dollar in some foreign currency falls.

Foreign Exchange Market for Dollars



France becomes more attractive to US tourists due to a fad for Paris



Supply of dollars: More Americans want to travel to France and convert $ into Euros for given price: Supply shifts out and dollar falls

Quiz on Exchange Rates

Suppose new Trump administration makes it harder for European tourists to visit the United States.

A. The demand curve of dollars in the foreign exchange market will shift to the left and the dollar depreciates

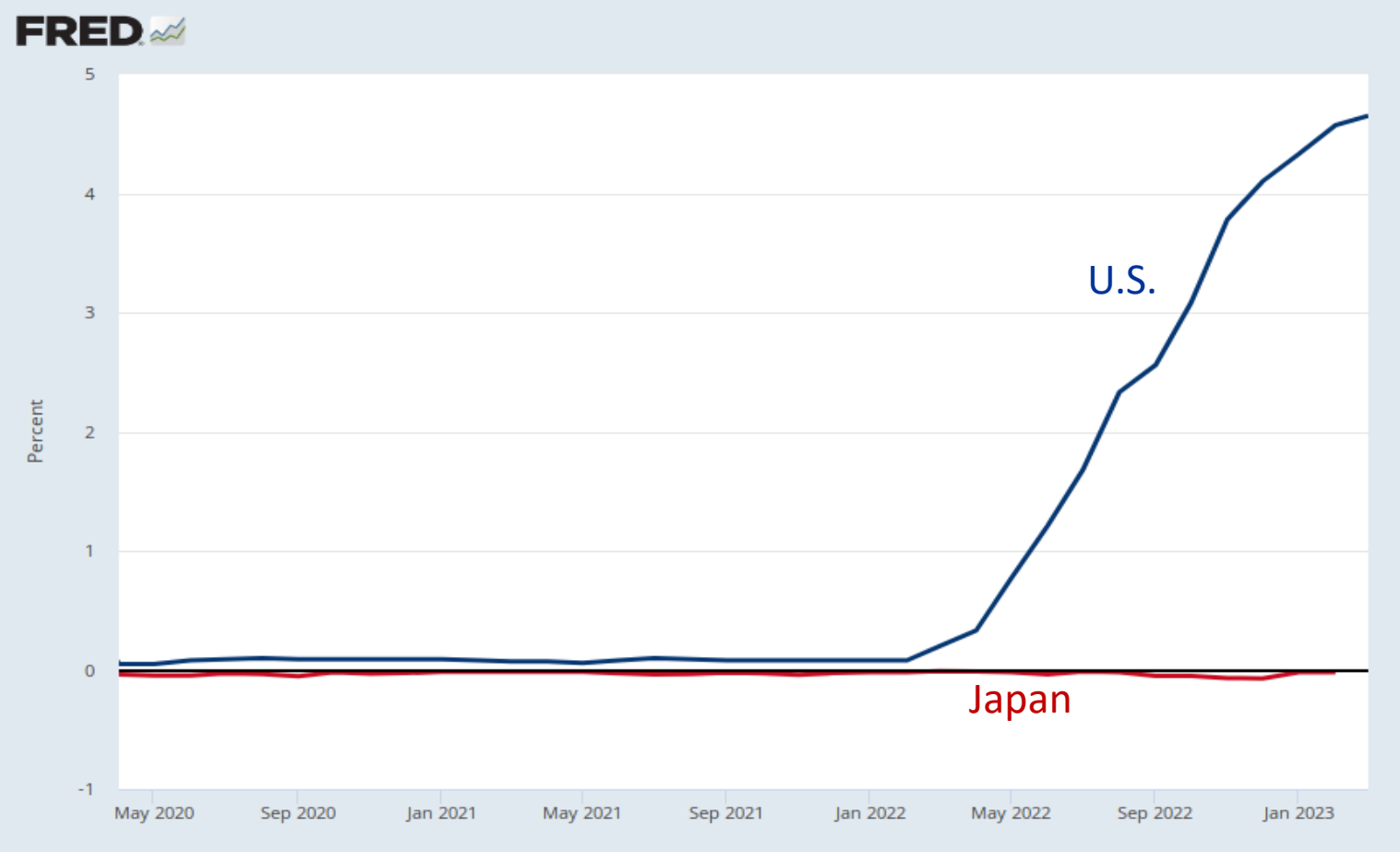
B. The demand curve of dollars in the foreign exchange market will shift to the right and the dollar appreciates

C. The supply curve for dollars in the foreign exchange market will shift to the left and the dollar appreciates

D. The supply curve for dollars in the foreign exchange market will shift to the right and the dollar depreciates

Example 2: A Rise in U.S. Real Interest Rates Relative to Those in Japan Recently

Interest Rates in the U.S. and Japan



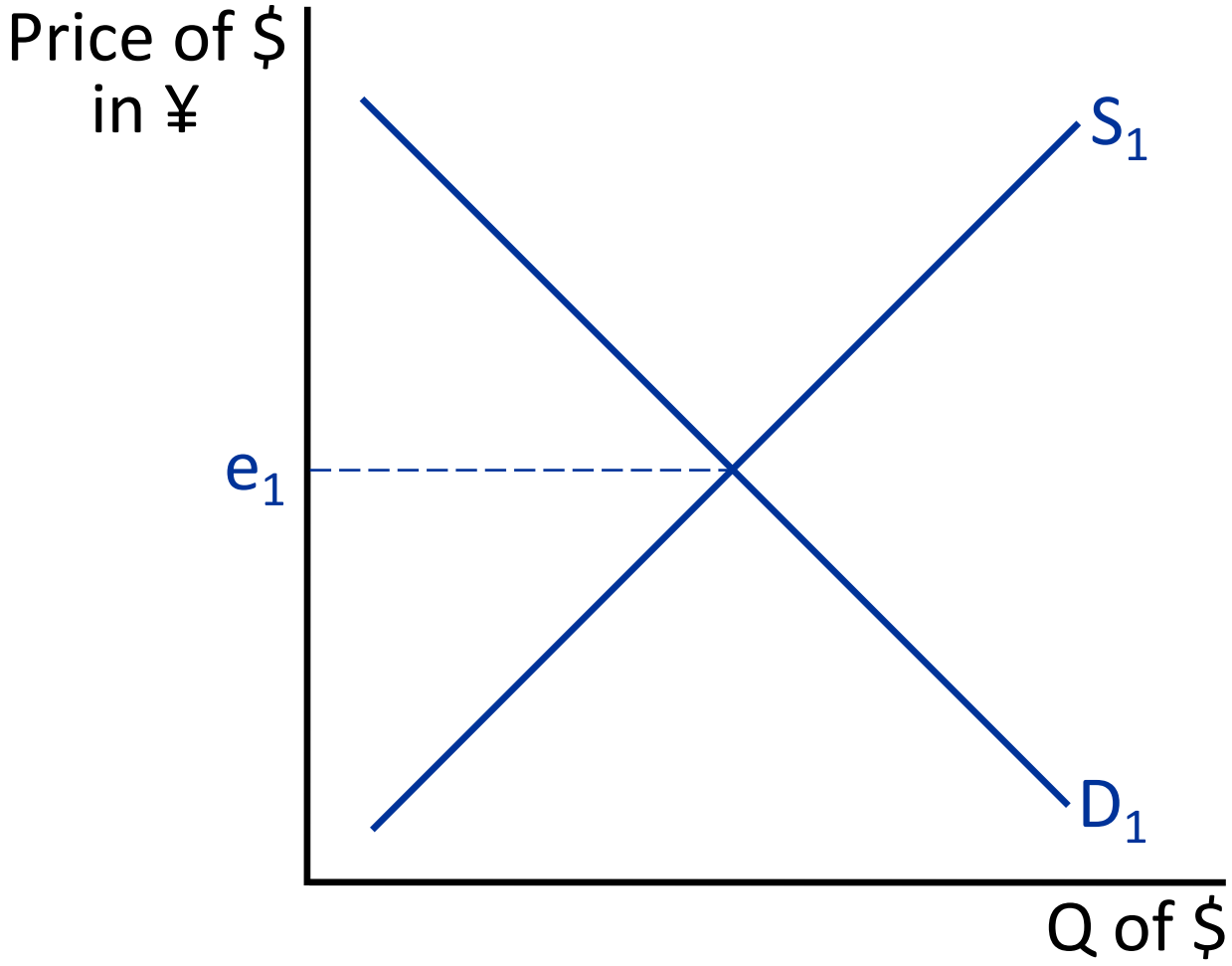
Source: Federal Reserve Bank of St. Louis, FRED.

Demand: Savers in Japan want to buy US bonds instead of Japanese bonds

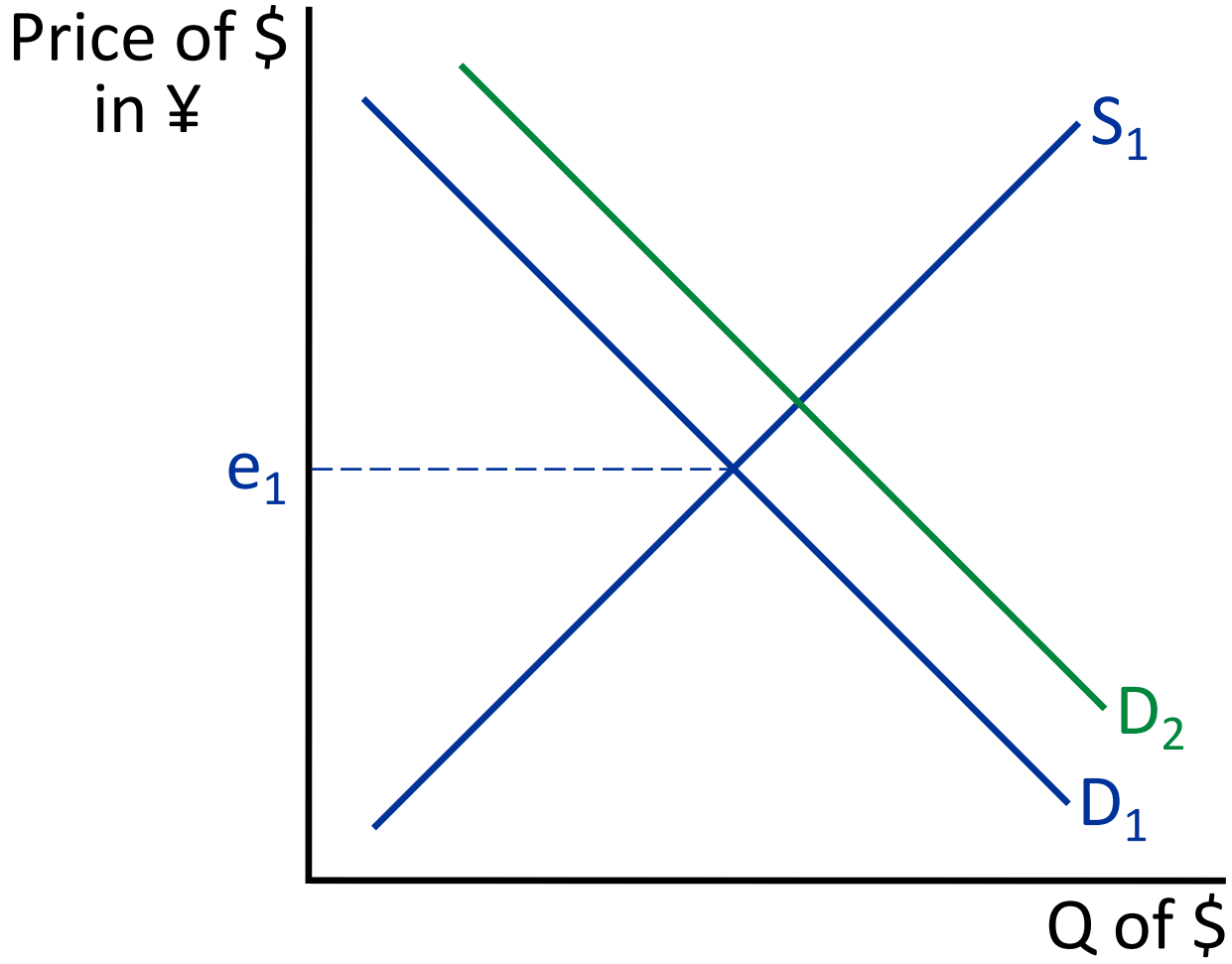
Supply: Savers in the US also want to buy US bonds instead of Japanese bonds

Foreign Exchange Market for Dollars

A Rise in the Real Interest Rate in the U.S.



Foreign Exchange Market for Dollars
A Rise in the Real Interest Rate in the U.S.



Demand: Savers in Japan want to buy US bonds instead of Japanese bonds

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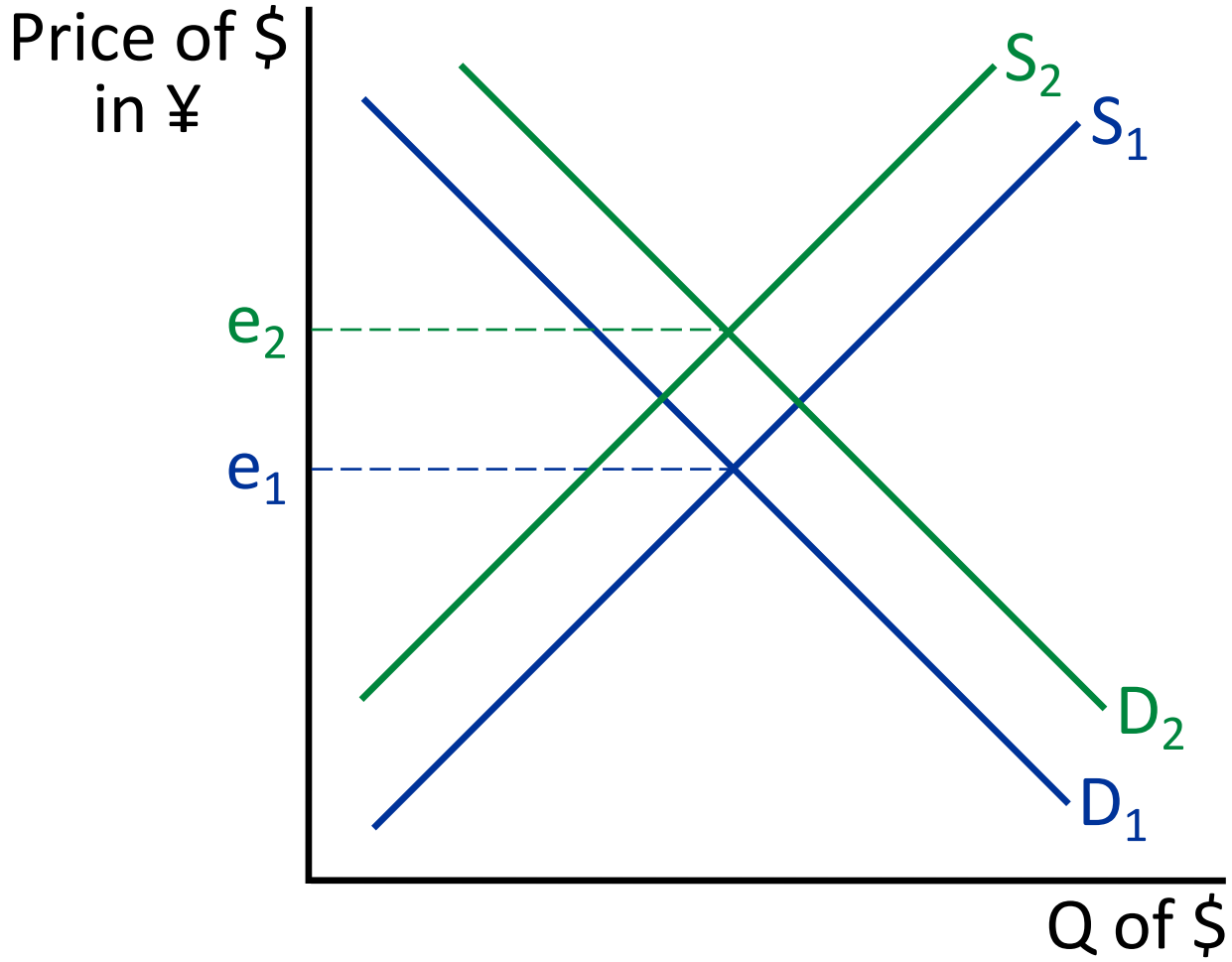
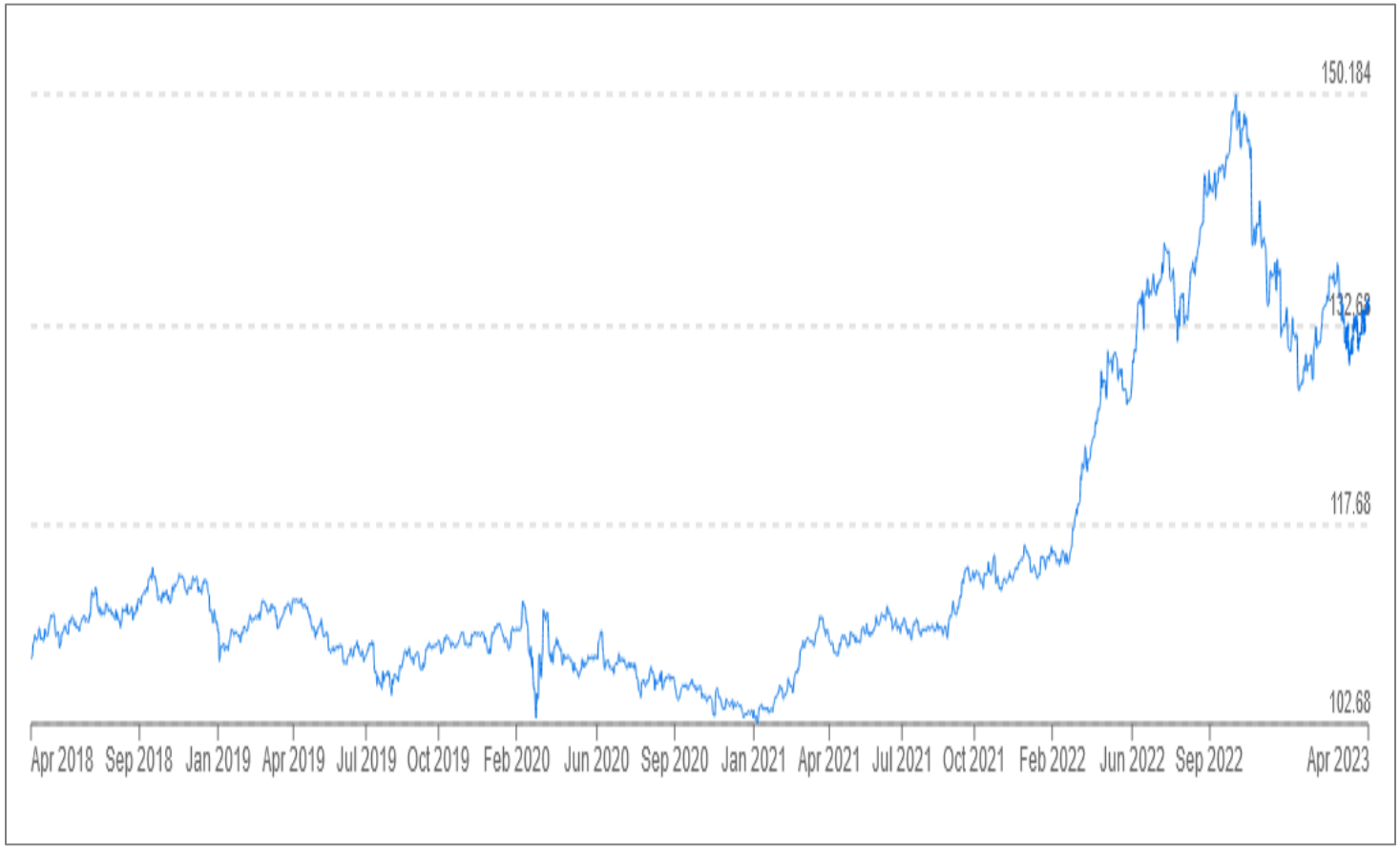


Supply: Savers in the US also want to buy US bonds instead of Japanese bonds

Both demand and supply effects increase exchange rate: $ appreciates

Japanese Yen per 1 US $



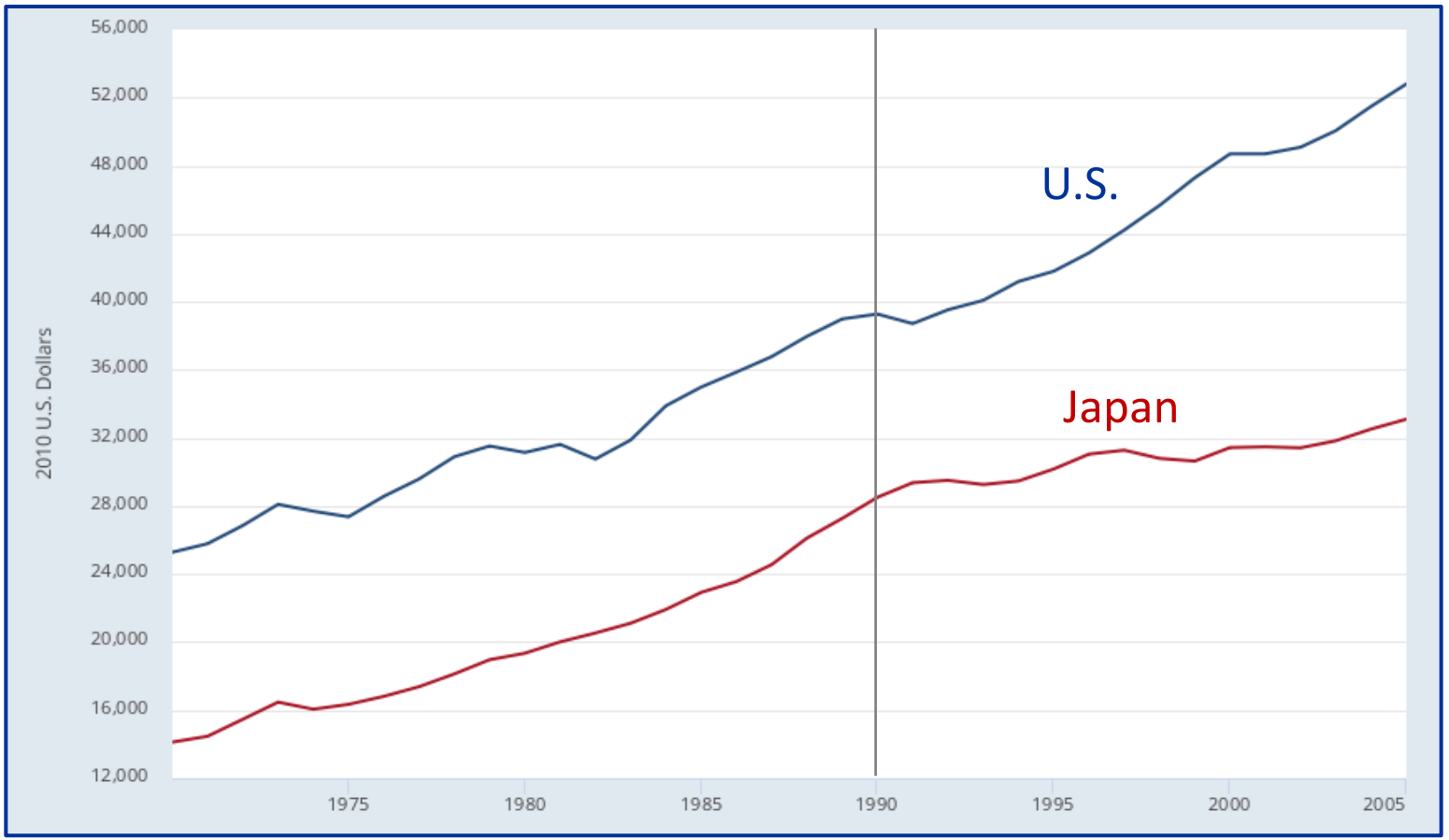
Source: xe.com.

The real interest rate is affected by monetary policy (in the short run)

- This means that monetary policy will affect the exchange rate.
- The effect of the real interest rate on the exchange rate is a key step in the negative relationship between r and NX
- In a nutshell: If r in US increases, $ appreciates, US goods become more expensive than foreign goods: stimulates imports and depresses exports => NX falls with r.

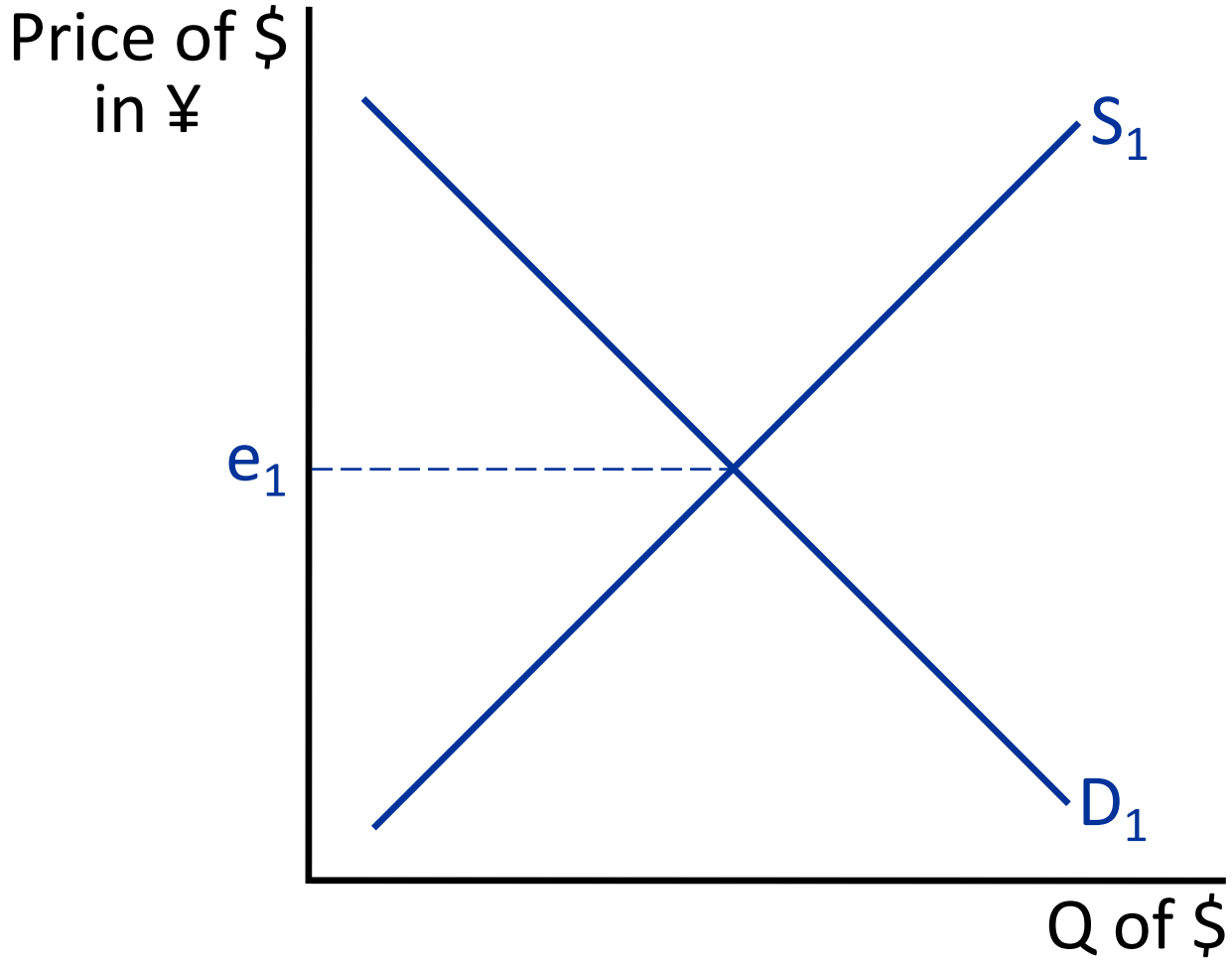
Example 3: Faster Income Growth in the U.S. than in Japan in the Early 1990s

Real GDP per Capita in U.S. and Japan in 1990s



Source: Federal Reserve Bank of St. Louis, FRED.

Foreign Exchange Market for Dollars
Faster Income Growth in the U.S. than in Japan



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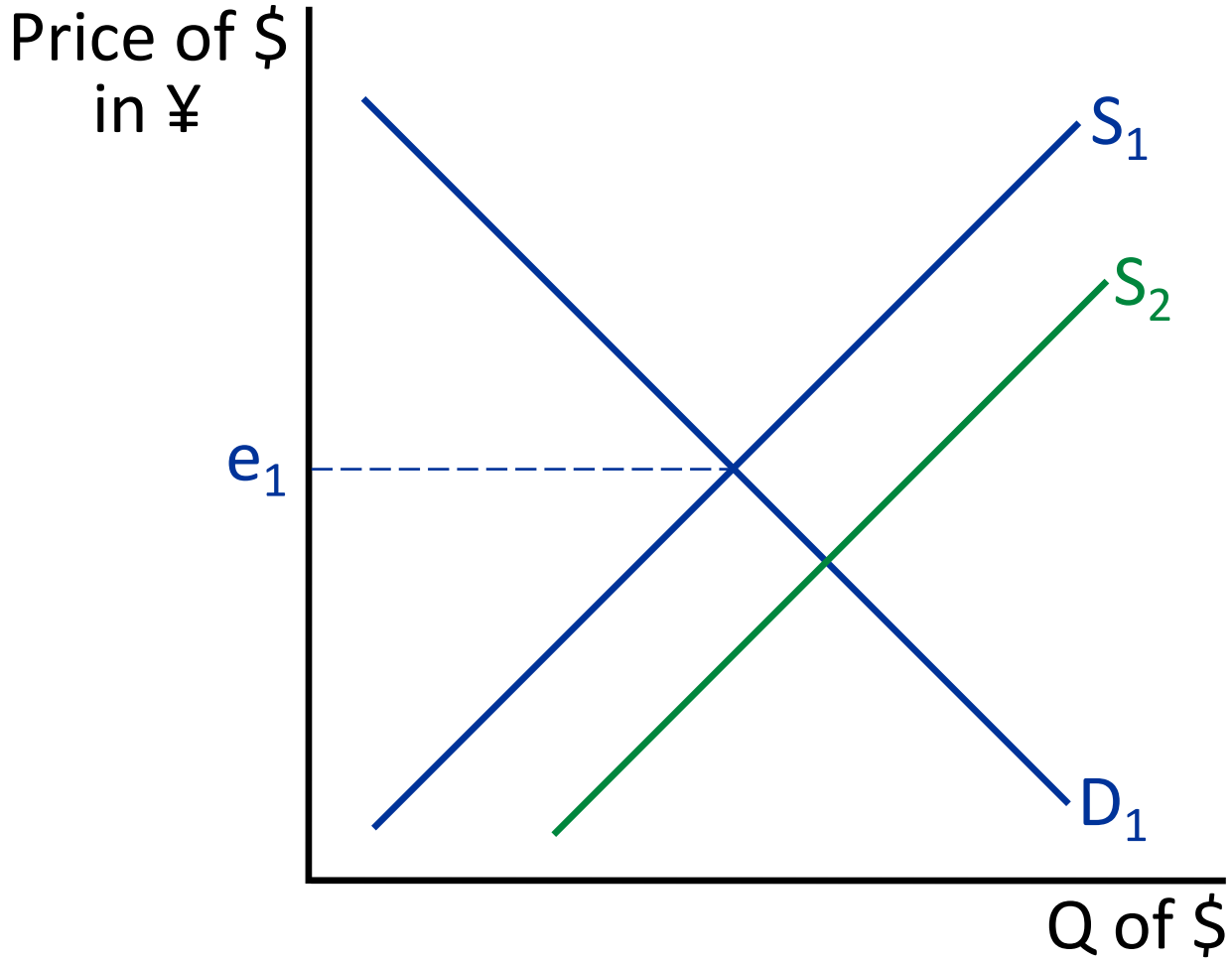

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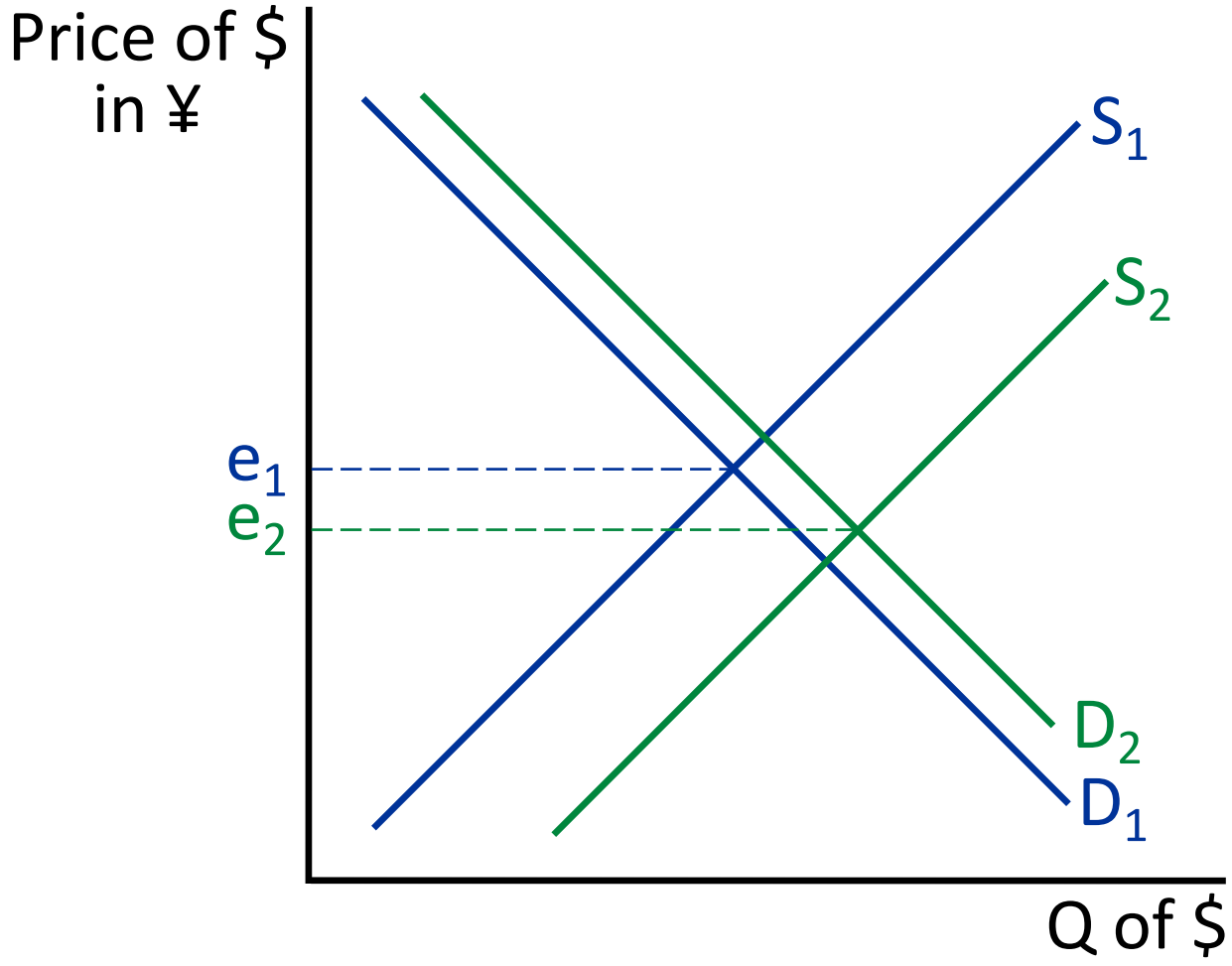
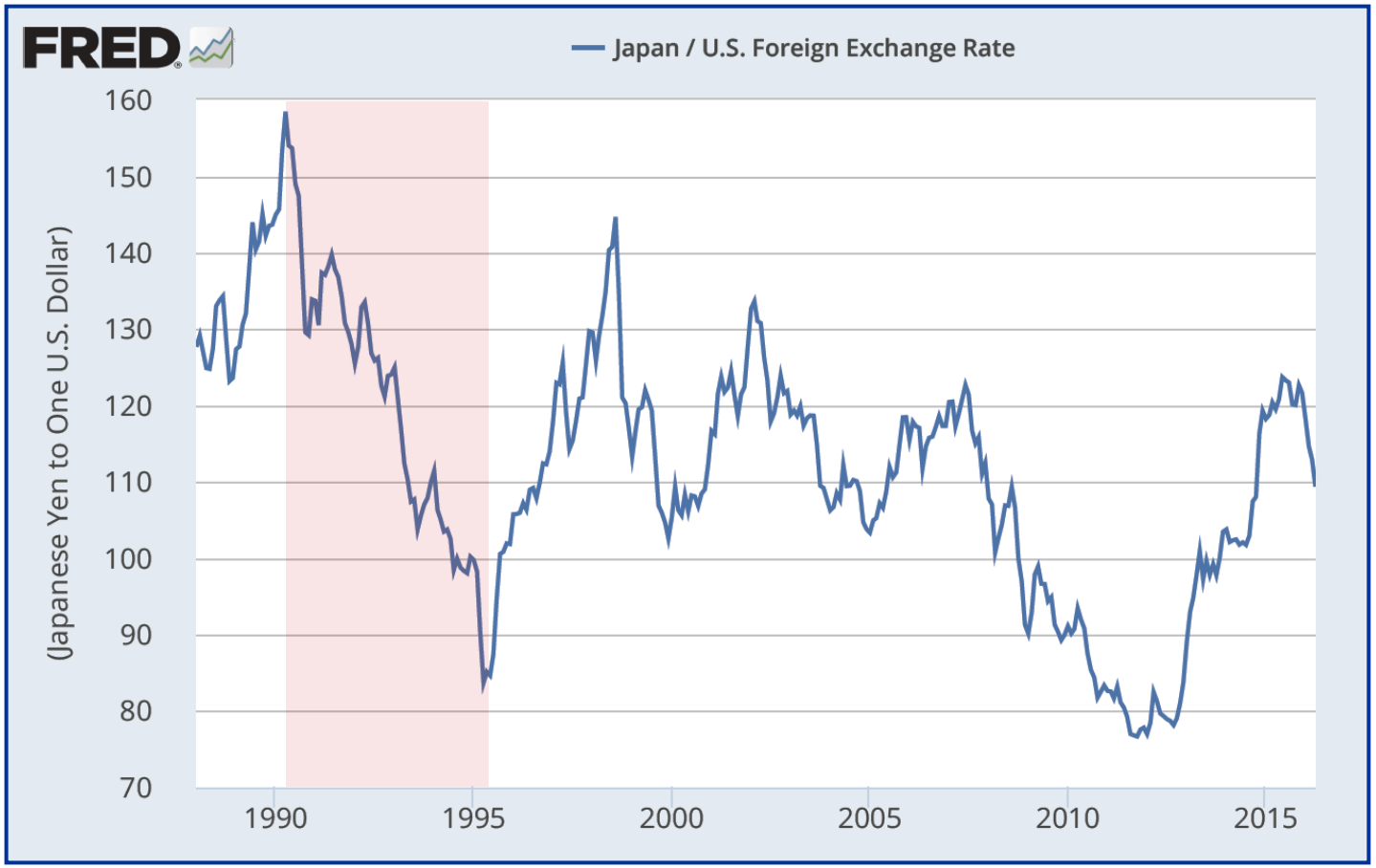


Japanese Yen per $1



Source: Federal Reserve Bank of St. Louis, FRED.

Strong vs. Weak Dollar

- Some terminology:
  - A strong currency is one whose price in terms of other currencies is high.
  - A weak currency is one whose price in terms of other currencies is low.

IV. The Balance of Payments

Balance of Payments

- An accounting of the supply and demand for dollars used in international transactions

Balance of Payments

At the equilibrium exchange rate:

Q of $ demanded = Q of $ supplied

EX + CI = IM + CO

EX: Exports of goods and services (foreigners buy US products)

CI: Capital inflows (foreigners buy US assets)

IM: Imports of goods and services (Americans buy foreign products)

CO: Capital outflows (Americans buy foreign assets)

Balance of Payments from US perspective

$$EX + CI = IM + CO$$

$$(EX - IM) + (CI - CO) = 0$$

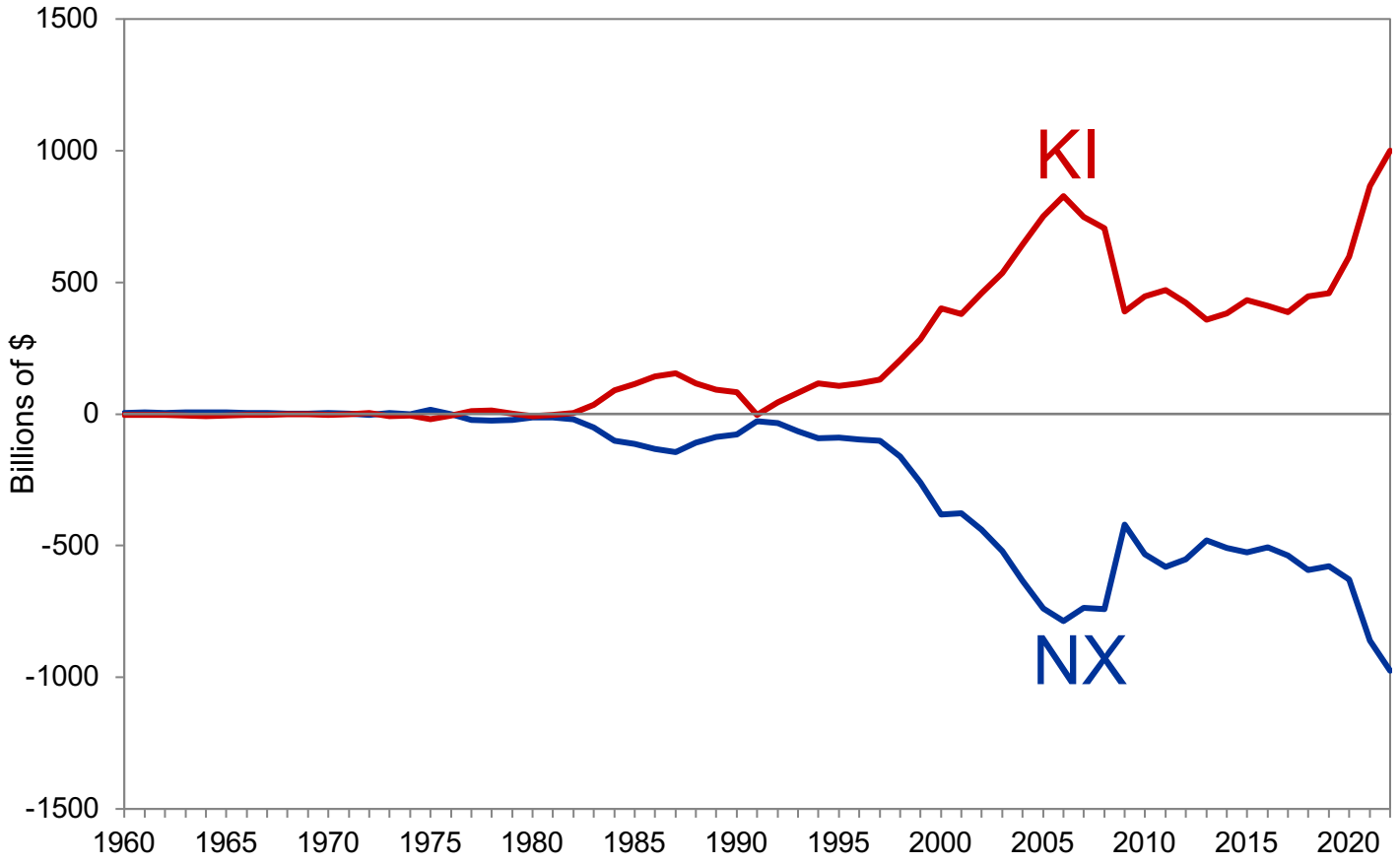
EX − IM: Net US exports (NX)

CI − CO: Net US capital inflows (KI)

$$NX + KI = 0$$

In words: If you export on net, you buy assets abroad. If you import on net, you have to sell some of your assets abroad

Net Exports (NX) and Net Capital Inflows (KI)



Source: Bureau of Economic Analysis

V. A Crucial Determinant of Net Exports

What Determines Net Capital Inflows?

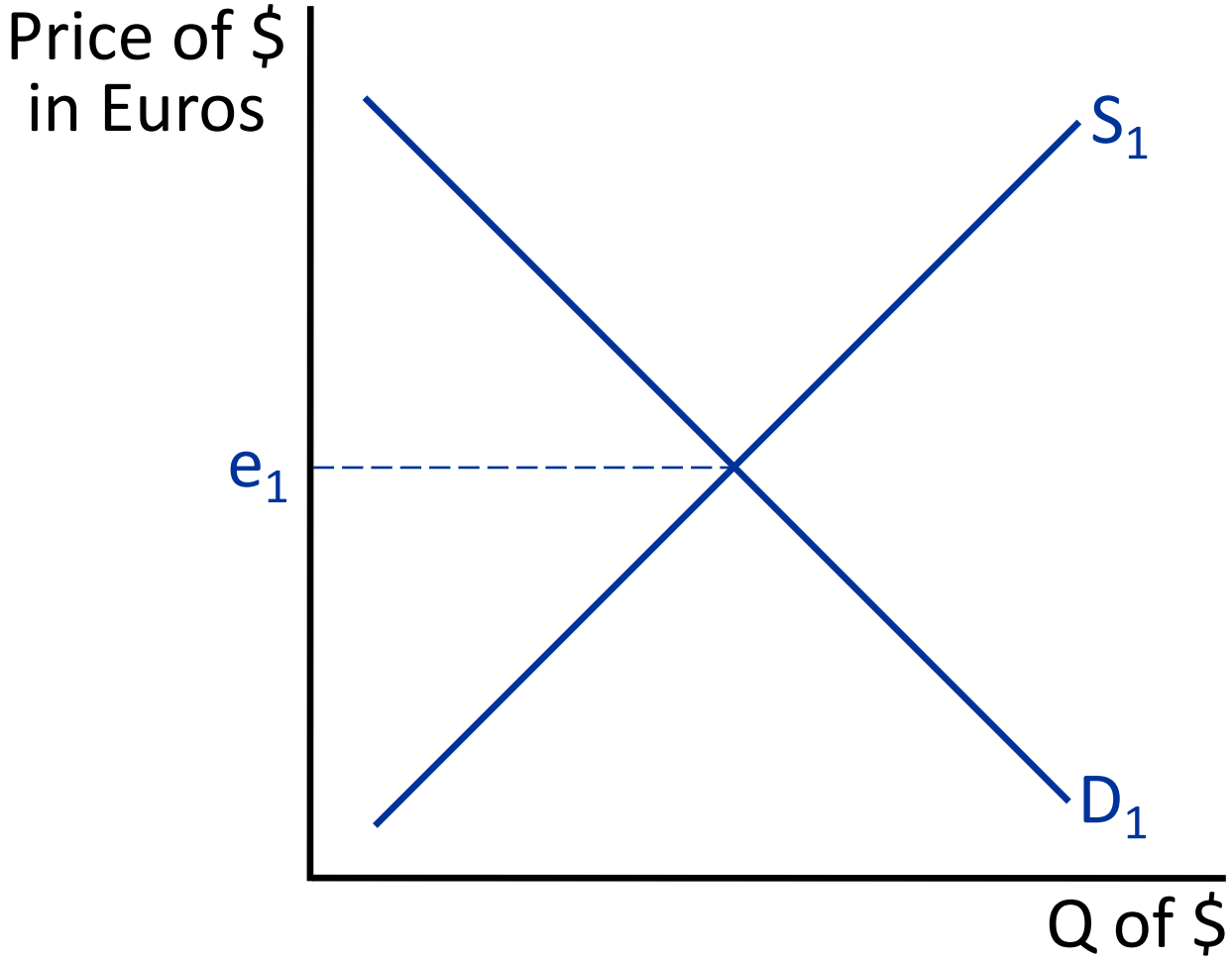
- The US real interest rate, r: If r rises, American assets become more attractive relative to foreign assets, and so net capital inflows rise.
- Foreign real interest rates: If real interest rates abroad rise, American assets become less attractive relative to foreign assets, and so net capital inflows fall.
- Also, “tastes” for assets: If Americans and/or foreigners find American assets more attractive at a given r, net capital inflows rise.

Implication for Net Exports: The Real Interest Rate Is a Crucial Determinant of NX

$$NX = -KI$$

- A rise in the real interest rate r raises KI; a fall in the real interest rate r lowers KI.
- Therefore: A rise in r lowers NX; a fall in r raises NX.
- Remember PAE(r)=C(r)+I(r)+G+NX(r)
- All three: C(r), I(r), NX(r) decline with r.

A Rise in the Real Interest Rate in the U.S.
Foreign Exchange Market for Dollars



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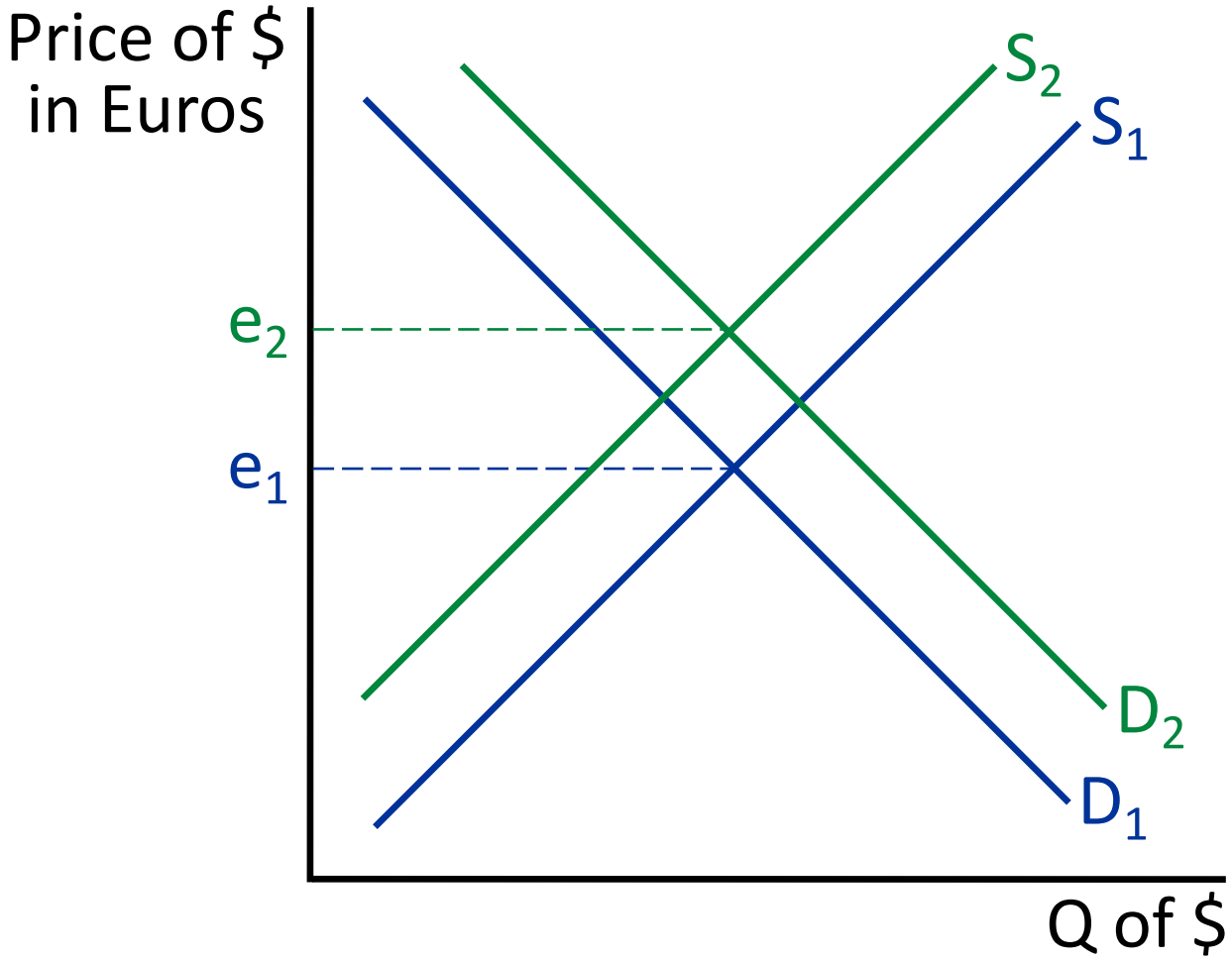


The dollar appreciation lowers exports and raises imports, and so lowers NX.

III. Saving, Investment, and the Real Interest Rate in the Long Run in an Open Economy

The Real Interest Rate

- r is a crucial determinant of KI, and hence of NX.
- So: we need to figure out what determines r.
  - We will continue to assume (realistically) that in the short run and in the medium run, r is determined by the Fed responding to inflation according to its reaction function.
  - But, what determines r in the long run?

Saving and Investment in the Long Run—The Case We've Considering Until Now (NX* = 0)

- Recall: $Y^* = C^* + I^* + G + NX^*$
- If $NX^* = 0$, this implies:

$$Y^* - C^* - G = I^*$$

- Using the definition of total savings S=Y-C-G, this implies:

$$\mathbf{S^* = I^*}$$

- r* adjusts to bring about $S^* = I^*$.

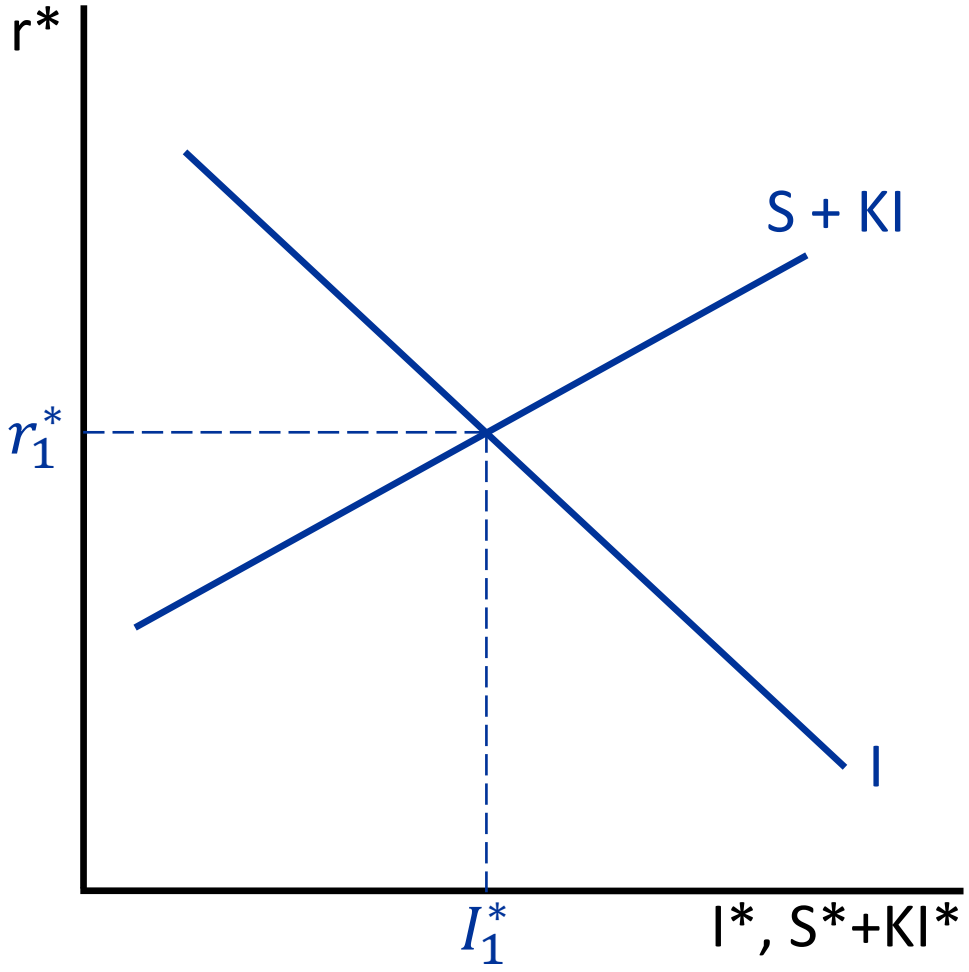
Saving and Investment in the Long Run When NX* Is Not Necessarily Zero

- Recall: $Y^* = C^* + I^* + G + NX^*$
- This implies: $Y^* - C^* - G - NX^* = I^*$
- Grouping the first 3 terms: $(Y^* - C^* - G) - NX^* = I^*$
- Using $NX = -KI$ and the definition of saving:

$$\mathbf{S^* + KI^* = I^*}$$

- r^* adjusts to bring about $S^* + KI^* = I^*$.

The Real Interest Rate in the Long Run



Note: Both saving and net capital inflows are increasing in r.

The Determinants of Our Normal Net Exports

- $NX^* = -KI^*$.
- KI^* depends on the domestic real interest rate versus foreign real interest rates and on tastes for domestic versus foreign assets.
- As a result, usually the best way to figure out how NX behaves in the long run is to figure out what happens to KI in the long run.

Key Messages (about Both the Short Run and the Long Run)

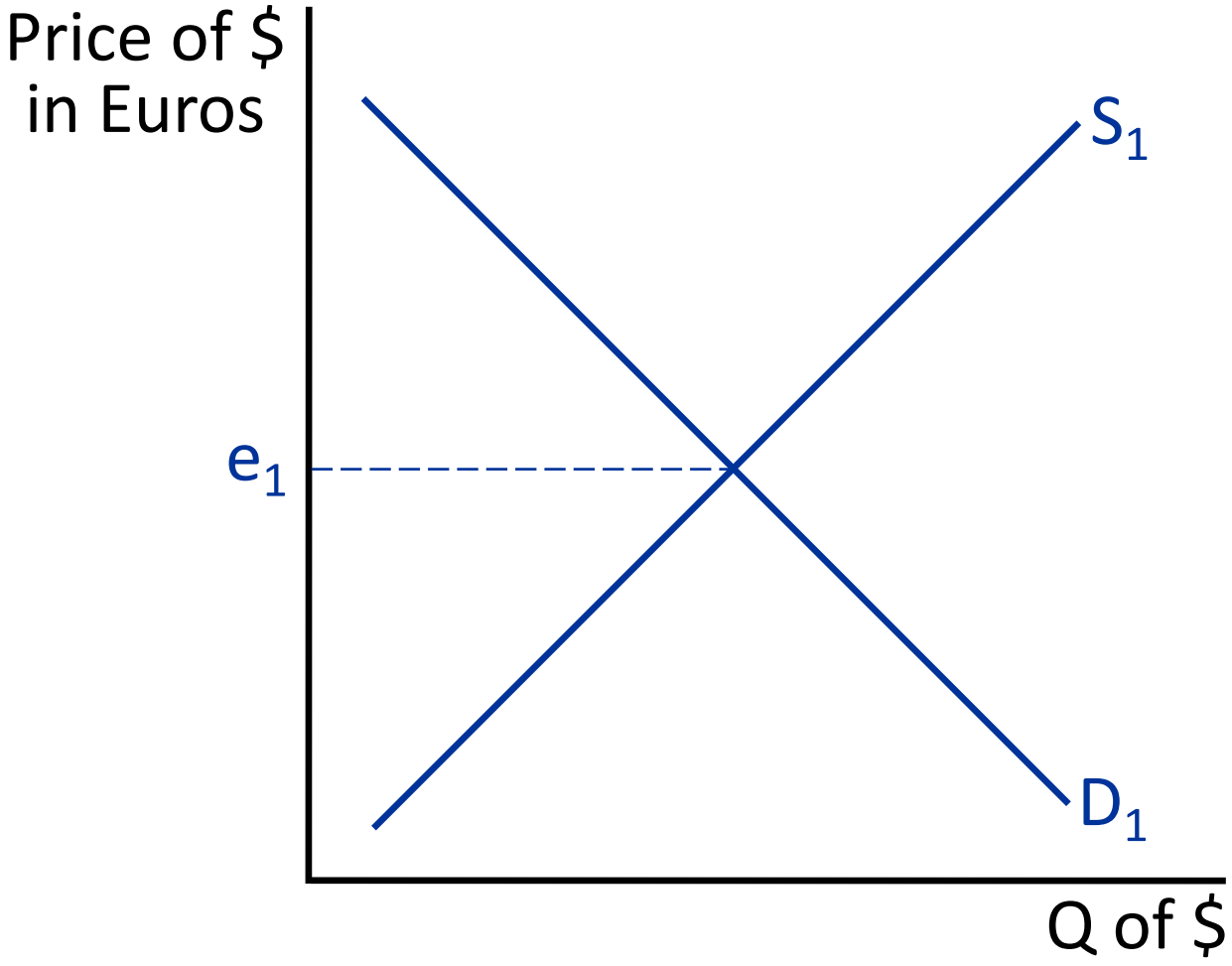
- $NX = -KI$ (and $NX^* = -KI^*$).
- The real interest rate is a crucial determinant of KI (and therefore of NX).
- In a world of international trade and capital flows, the real interest rate in the long run is the one that causes $S^* + KI^*$ to equal I^*.

IV. Application: Higher Tariffs on Many Goods

Application: Higher Tariffs on Many Goods

- The scenario we're considering:
  - The economy starts in long-run equilibrium.
  - There is then a long-lasting increase in tariffs on many goods (Trump 2025)
  - We (unrealistically) assume that other countries don't raise their tariffs in response.
- We'll start by analyzing the short-run effect.

Foreign Exchange Market for Dollars
The U.S. Raises Tariffs on Many Goods



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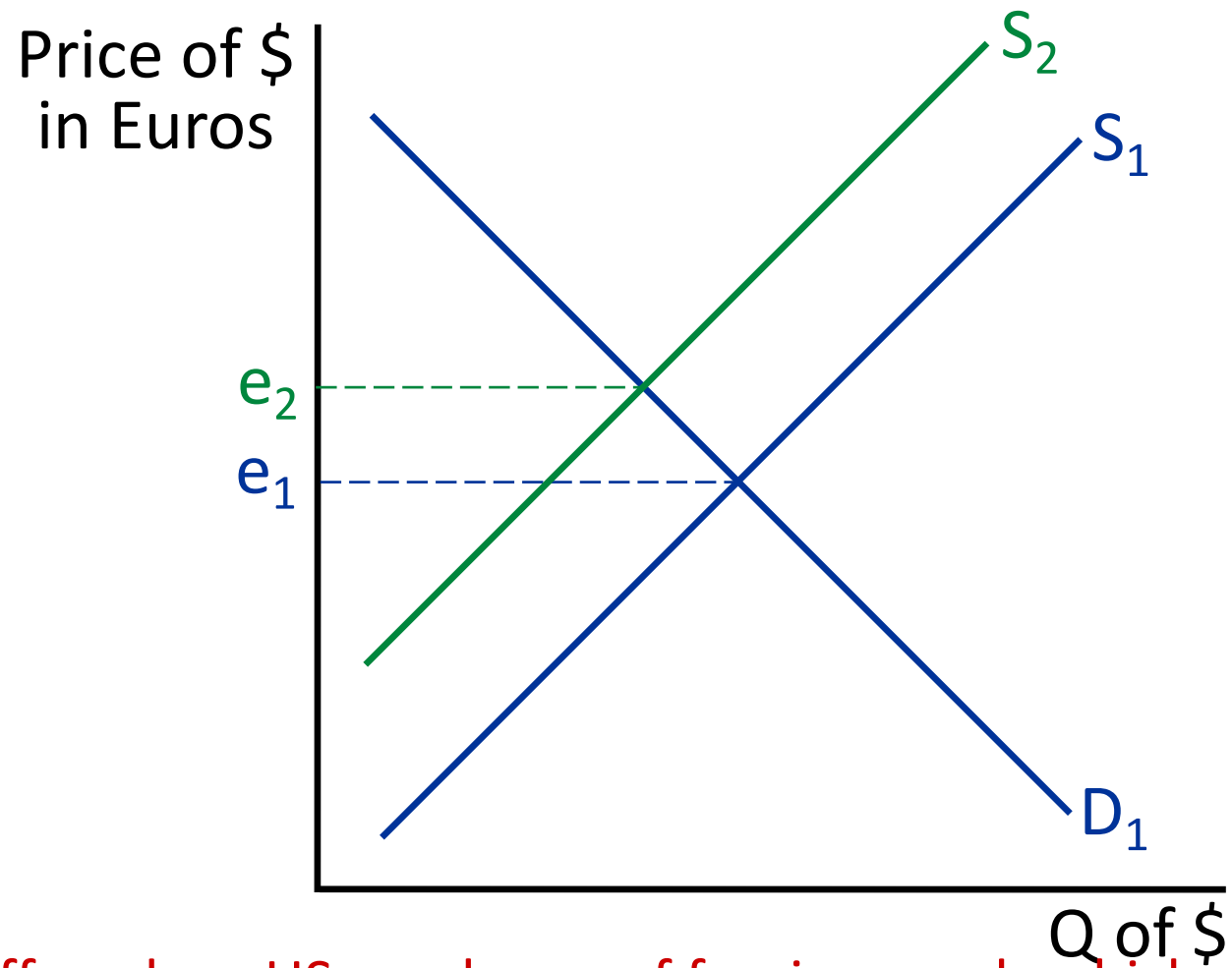
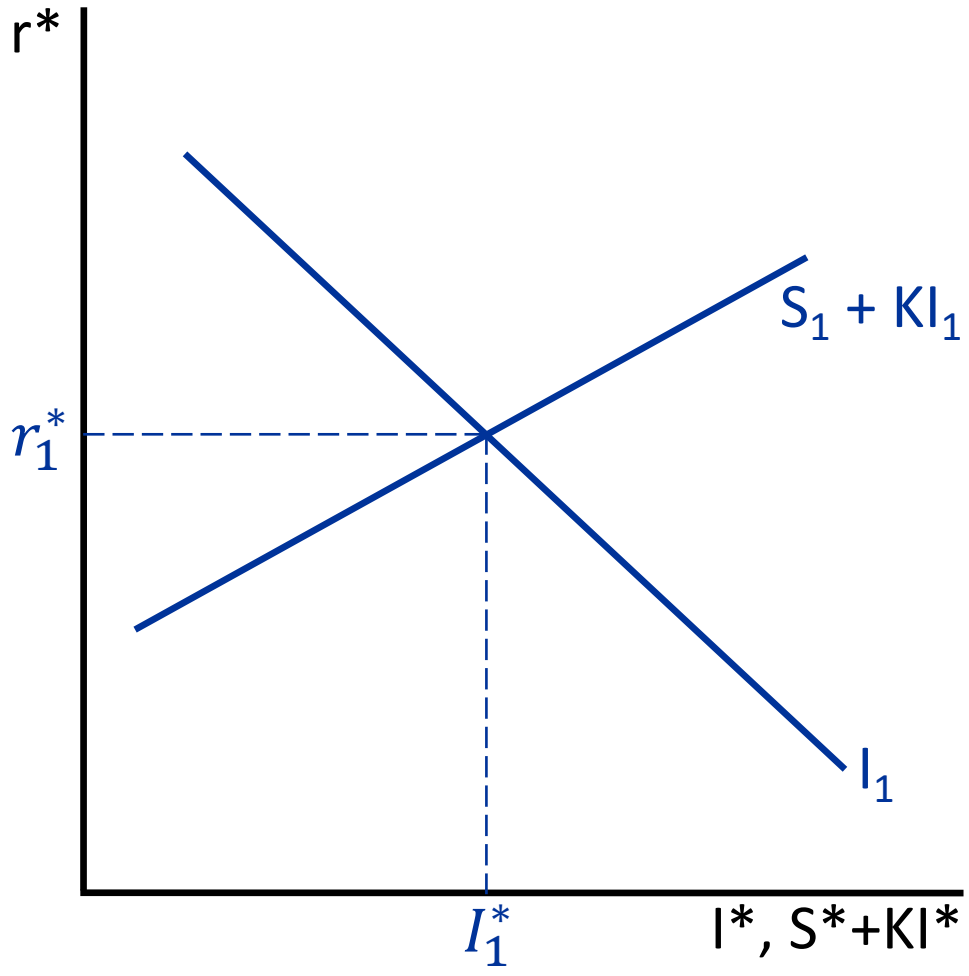


Tariffs reduce US purchases of foreign goods which reduces the supply of dollars from the US on foreign exchange market

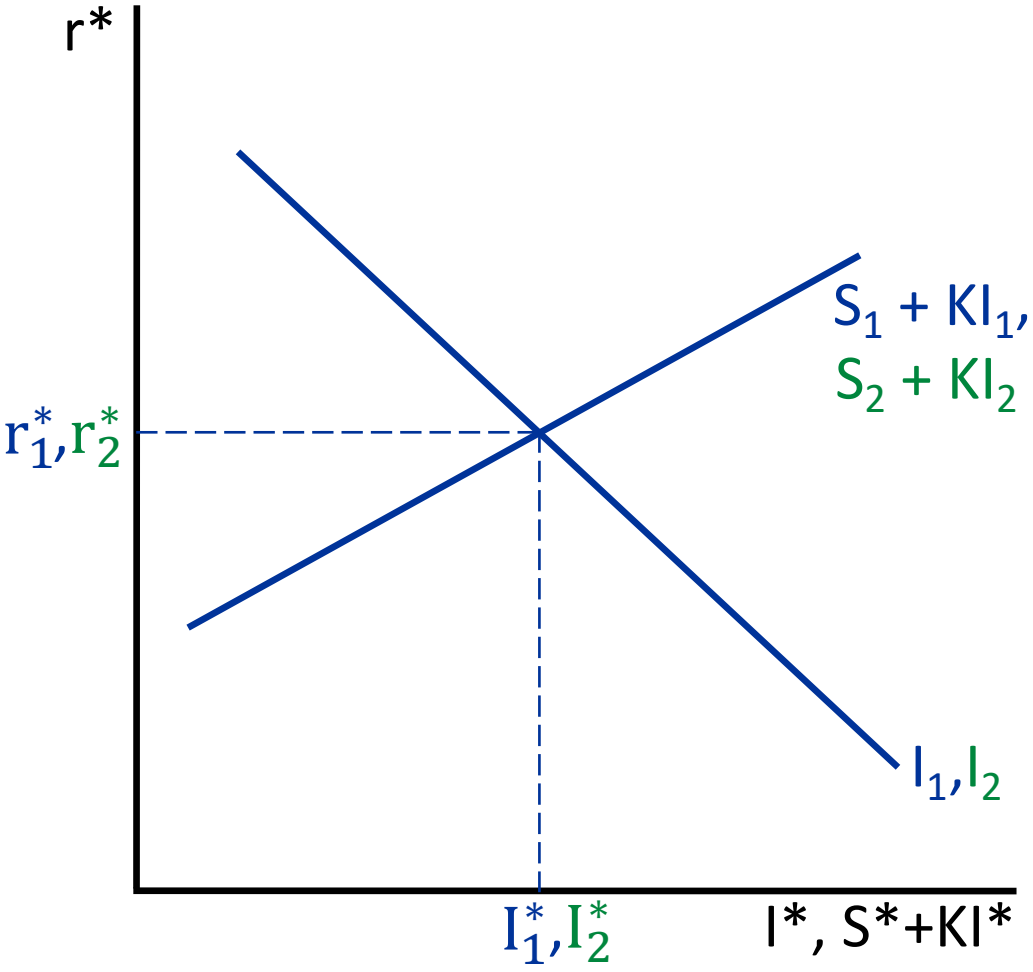
Determining the Effect on Net Exports

- At a given exchange rate, imports will fall, and so net exports will rise.
- But the exchange rate appreciates, which reduces exports and raises imports, and so causes net exports to fall.
- What is the overall effect?
- Recall: Determining the behavior of net exports:
  - To figure out what happens to NX, we need to figure out what happens to KI.
  - But nothing happens to KI!
  - So nothing happens to NX.

The Long-Run Effect on Net Exports



The Long-Run Effect on Net Exports



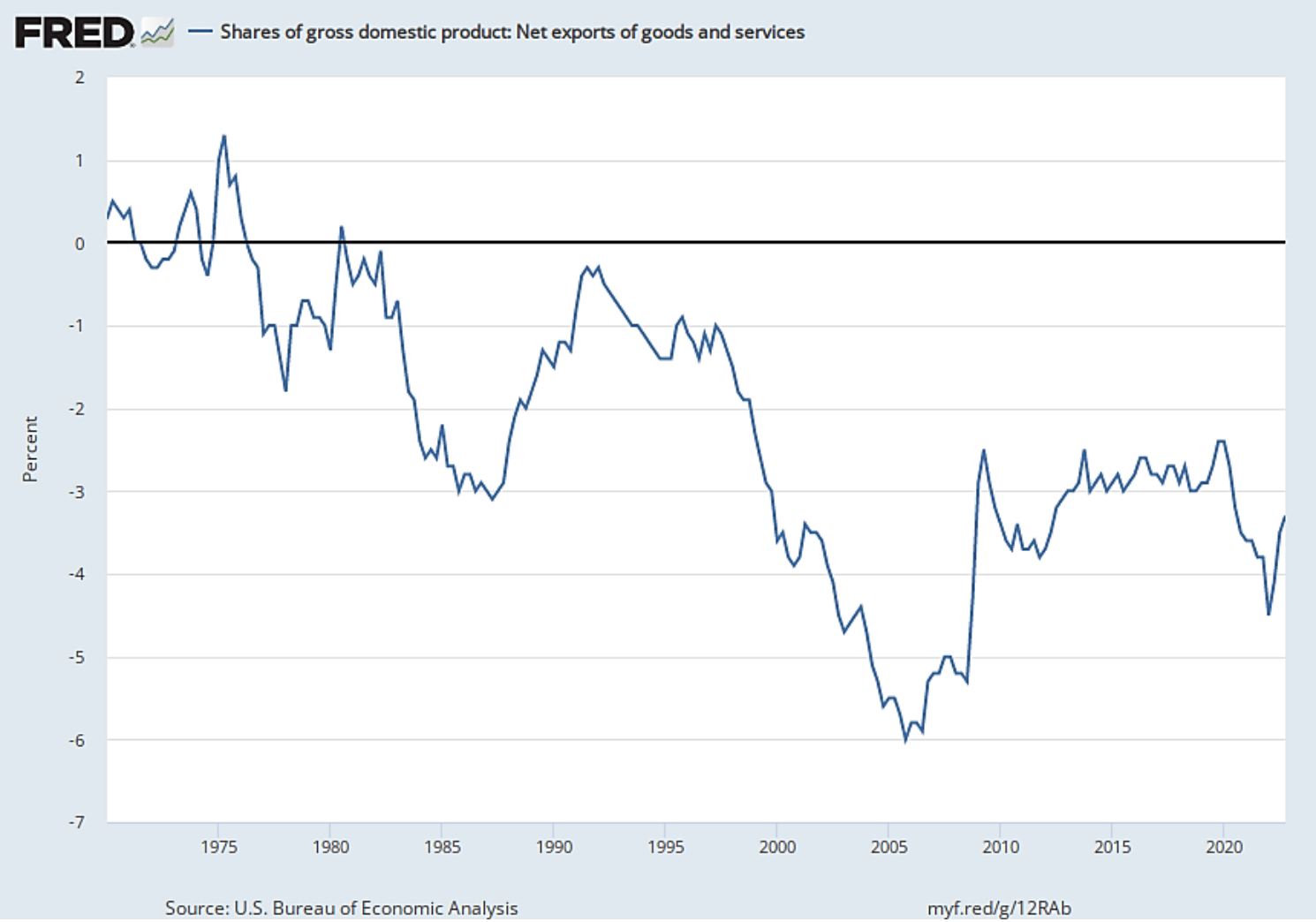
The tariffs do not affect NX in the long run (nor in the short run).

How Seriously Should We Take This?

- Will higher tariffs on many goods have literally ***no*** effect on NX?
  - Almost surely not: All models are approximations.
- Is there a force that clearly works against the direct effect of the tariffs on NX?
  - Yes! The reduced supply of dollars will drive up the price of dollars in foreign currency markets.
- Will the tariffs have ***approximately*** no effect on NX?
  - Very likely yes: As long as KI doesn't respond a lot to the exchange rate (which is realistic), the impact on NX is small. (We assume KI doesn't respond at all to the exchange rate, which is why we find no impact on NX.)

V. The Current U.S. Trade Deficit

U.S. Net Exports (as a percent of GDP)

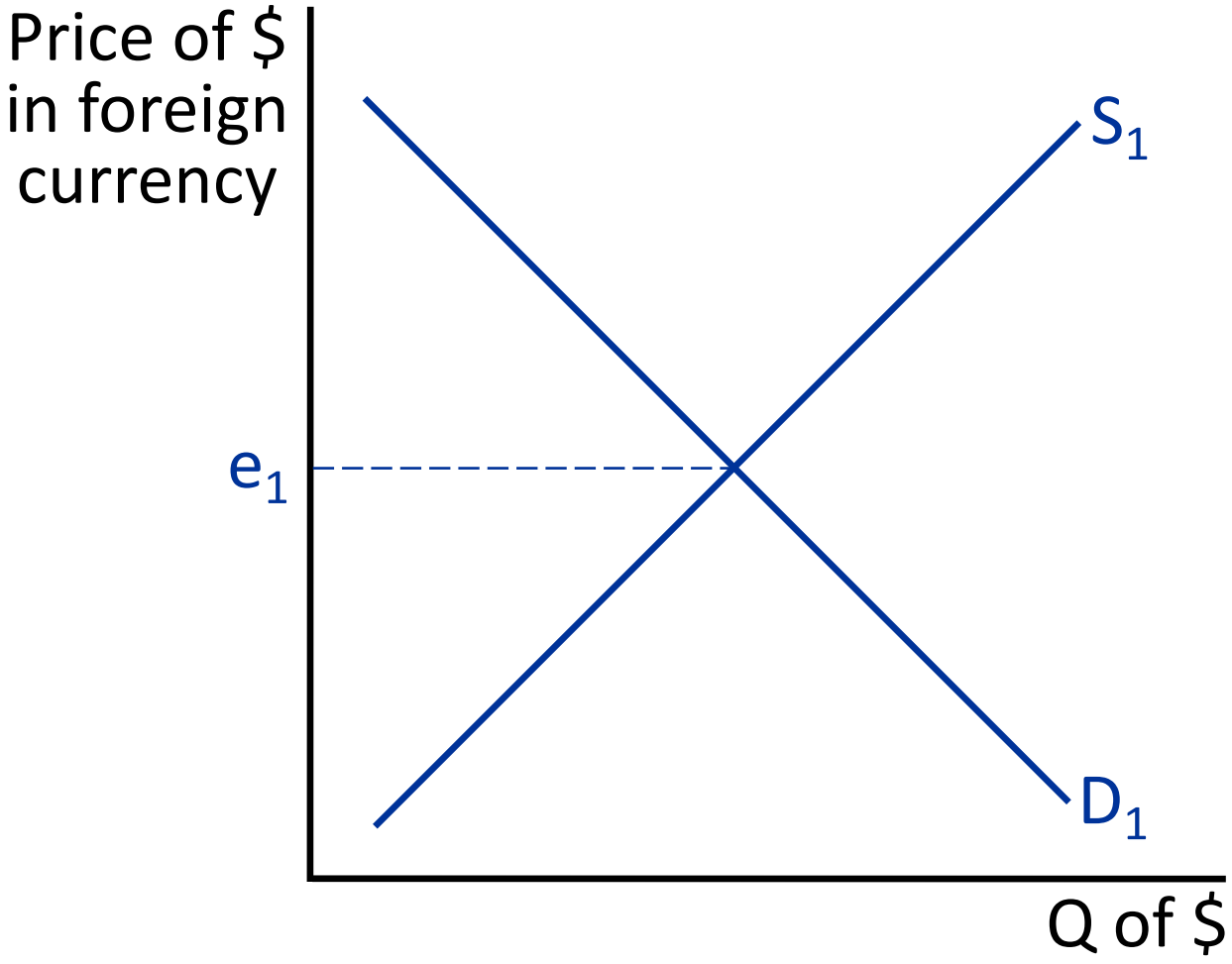


The U.S. been running a large trade deficit for decades.

Mistaken Explanations of the U.S. Trade Deficit

- We aren't productive enough; our goods and services are of low quality.
- Americans have strong tastes for foreign goods.
- Foreign countries engage in widespread protectionist polices.
- The problem: These theories predict a weak dollar, not a large trade deficit.

Foreign Exchange Market for Dollars
The Quality of U.S. Goods Deteriorates



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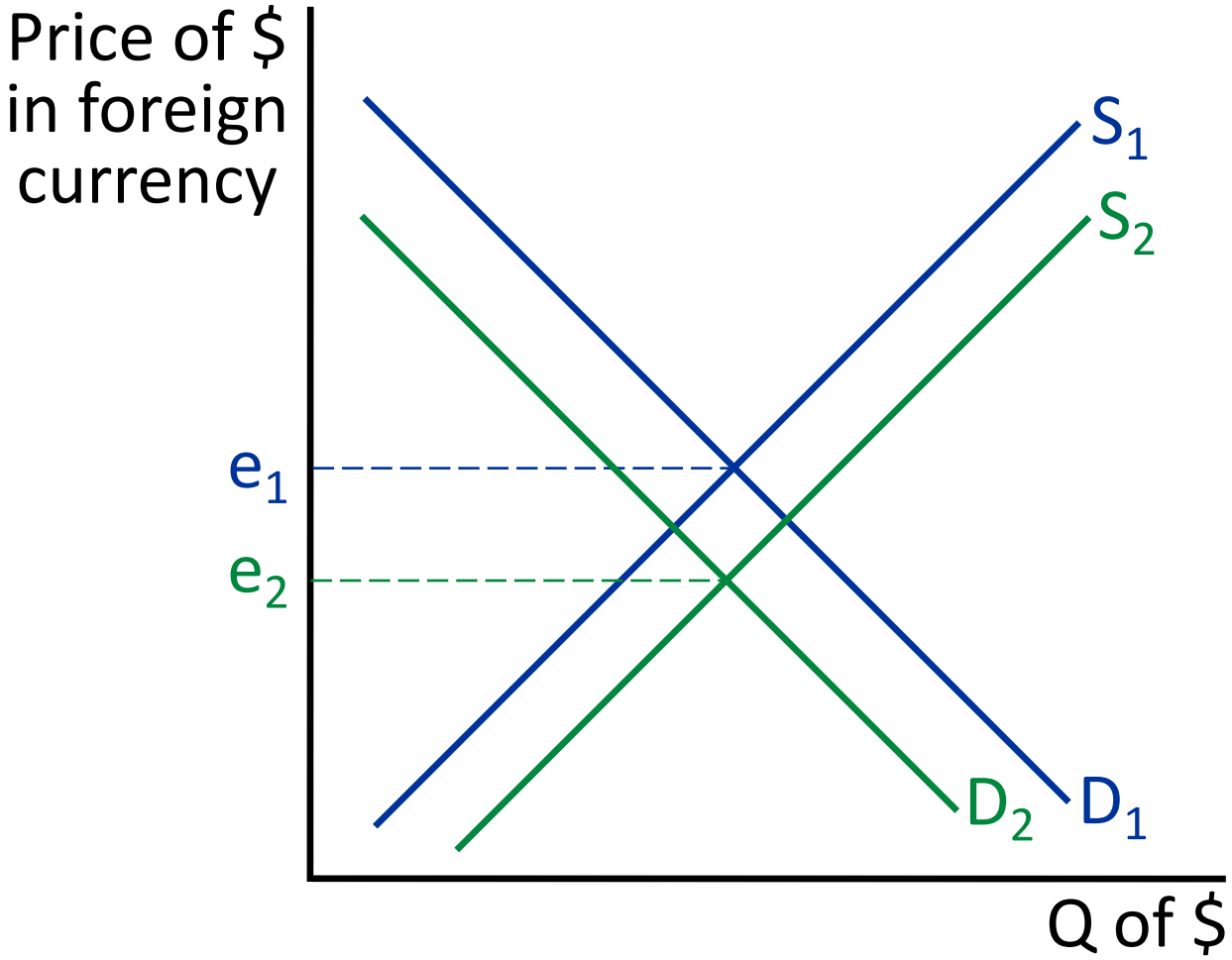


Foreigners want to buy fewer US goods (demand) and Americans want to buy more foreign goods (supply). Both effects reduce exchange rate

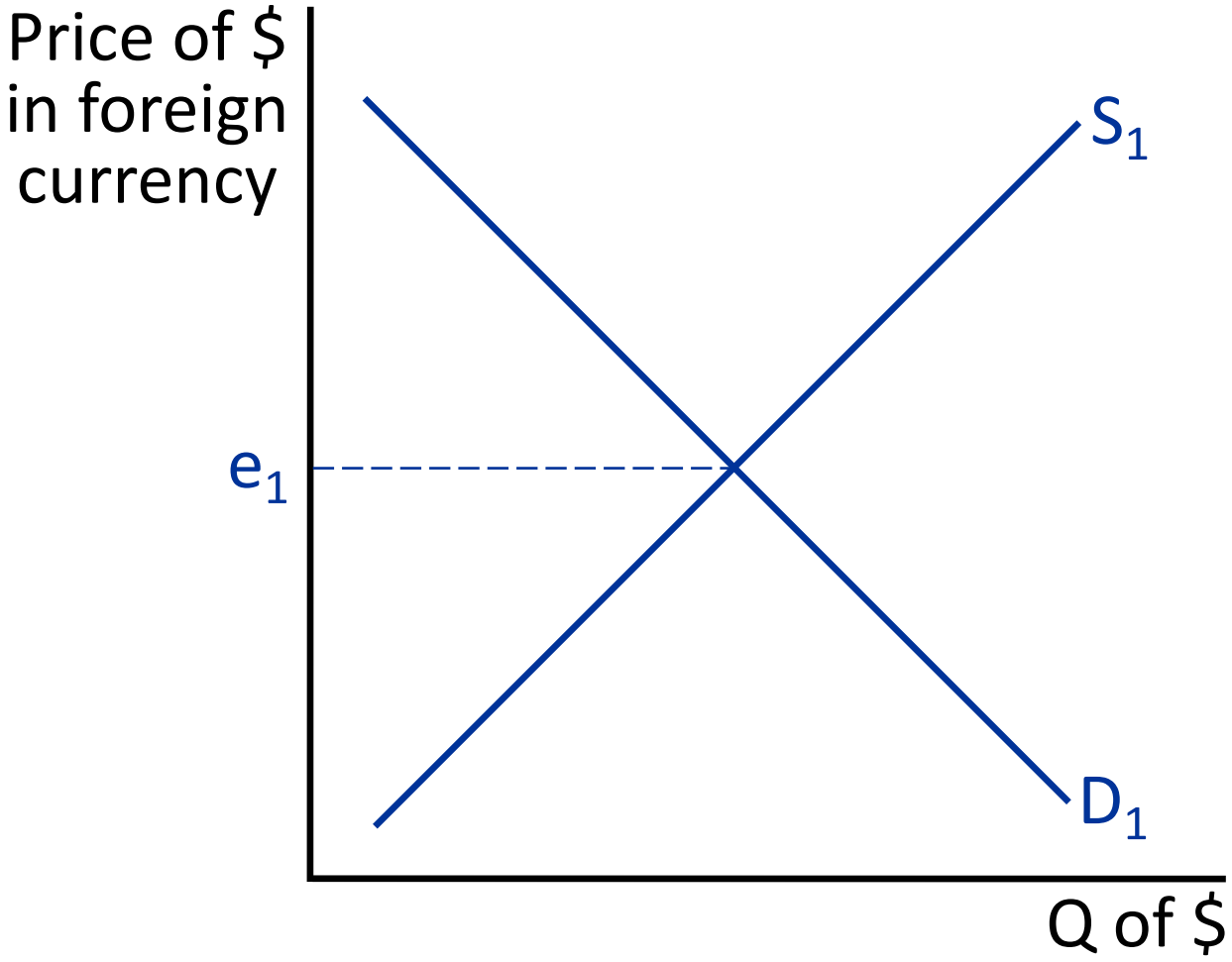
Understanding the Persistent U.S. Trade Deficit

- Recall: $NX^* = -KI^*$.
- So, to understand why NX^* is large and negative (that is, a persistently large trade deficit), we need to understand why KI^* is large and positive.

A Factor That Has Contributed to the Persistent U.S. Trade Deficit

- U.S. assets look highly attractive.
    - Perhaps because people think risky U.S. assets are likely to pay off especially well (for example, tech in the 1990s, housing in the early 2000s).
- As a result, KI is big and positive—so NX is big and negative.
- To put it another way: the increased attractiveness of US assets shifts the supply and demand curves in the foreign exchange market, leading the dollar to appreciate, and so causing NX to fall.

Foreign Exchange Market for Dollars
Change in Tastes Toward U.S. Assets



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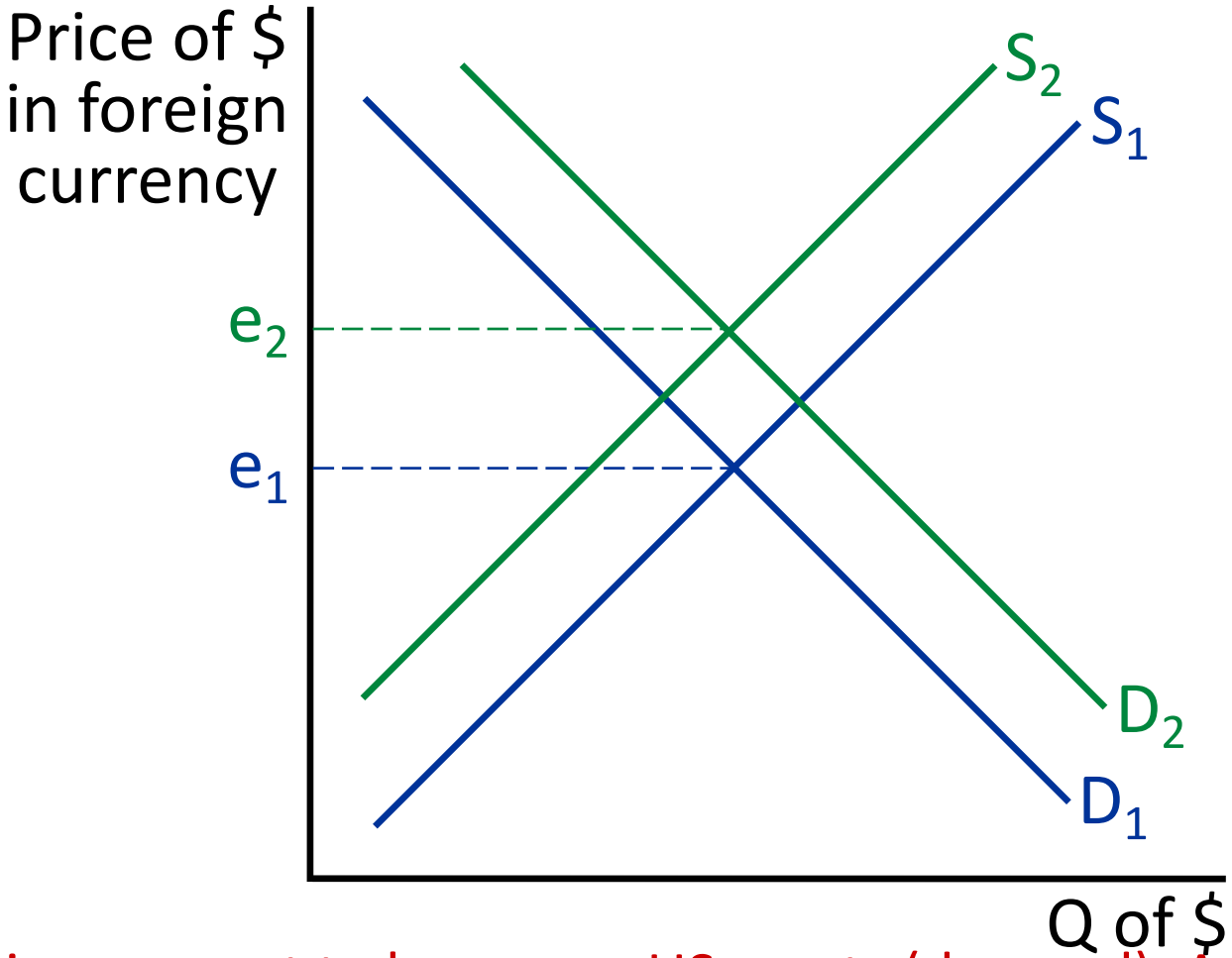

Foreigners want to buy more US assets (demand). Americans want to buy fewer foreign assets (supply) => The dollar appreciates.

References

- Principles of Economics, Chapter 28.