Pegged Exchange Rates

Slides for KOMIE Ch18 ()

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Topics Preview

Monetary authority balance sheets:

- monetary base vs. money supply
- foreign exchange market interventions

Fixed exchange rates:

- fixed rate regimes (reserve currency vs gold standard)
- effectiveness of monetary and fiscal policies

Financial market crises:

- capital flight

Why Model Fixed-Rate Regimes?

- EMS (ERM-II) and other regional arrangements
- Developing and transitional economies
- Assessing policy proposals for managed rates

Monetary Authority Balance Sheet

Assets:

- Domestic Credit
  - Domestic government bonds
  - Loans to banks (e.g., discount loans)
- Foreign Assets
  - Gold
  - Foreign government bonds

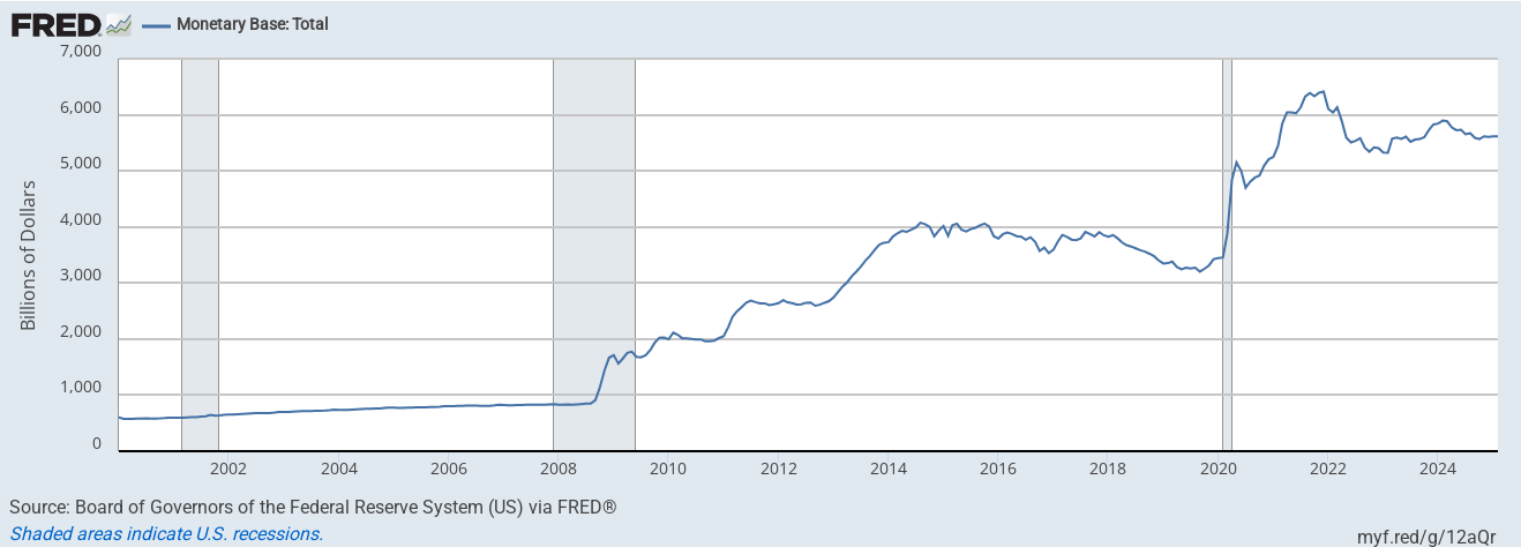
Liabilities (Monetary Base):

- Currency in circulation
- Reserves
  - Vault Cash
  - Deposits with monetary authority

Dollar Base: https://research.stlouisfed.org/fred2/series/BOGMBASE

Euro Base: https://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=123.ILM.M.U2.C.LT00001.Z5.EUR

Monetary Base



Source:

https://fred.stlouisfed.org/series/BOGMBASE

H6 Statistical Release

https://www.federalreserve.gov/releases/h6/current/default.htm

(The 2020 change in definition of M1 did not change the monetary base measure.)

Monetary Authority's Balance Sheet (cont.)

Assets = Liabilities + Net worth

Assume that net worth is constant: $\rightarrow$ a change in assets implies an equal change in liabilities.

Changes in the monetary authority's balance sheet:

- lead to changes in the monetary base (H)
  - H = currency in circulation + reserves
- which leads to changes in the money supply
  - money multiplier: M = multiplier $\times$ H

M1 Multiplier:
https://fred.stlouisfed.org/graph/?g=wroO

Asset Purchase by Monetary Authority

Asset purchases by the monetary authority "create money"

- seller receives a liability of the monetary authority $\rightarrow$ change monetary base
  - currency (probably not)
  - electronic entry in a reserve account
    - either immediate or when a check is cashed
- money supply (M1, M2, etc) responds via money multiplier
- Outright purchases vs. repos
  - repo: sale and repurchase agreement
  - Fed often uses repurchase agreements to temporarily increase reserves
    - (note: Fed terminology is from counterparty's perspective!)

Asset Sale by Monetary Authority

- Asset sales by the monetary authority "destroy money"
  - buyer pays with a liability of the monetary authority $\rightarrow$ change monetary base
- money supply (M1, M2, etc) responds via money multiplier
- leads to equal decreases of assets and liabilities.
- When the monetary authority sells securities the domestic money supply decreases
  - e.g., domestic bonds or foreign bonds
- Outright sales vs. reverse repos
  - Fed often uses reverse repurchase agreements to temporarily decrease reserves
    - (note: Fed terminology is from counterparty's perspective!)

US Open Market

Federal Reserve System asset purchases and sales take place in the “open market”

- Fed’s Open Market Desk (of the NY Fed) announces operations
- open market transactions occur through a competitive bidding process
- only qualifying primary dealers trade with the Fed (i.e., the market is not really “open”)
- dealers submit “propositions” and receive results electronically
- the open market desk uses software to facilitate dealer selection

Fed Balance Sheet

Federal Reserve Statistical Release H.4.1

- 2008-01-03: assets = $925B
- 2009-01-07: assets = $2,122B
- 2010-01-06: assets = $2,216B
- 2015-11-27: assets = $4,522B
- 2016-11-30: assets = $4,446B
- 2021-04-15: assets = $7,795B
- 2022-04-07: assets = $8,987B
- current: https://www.federalreserve.gov/releases/h41/current/default.htm

Maiden Lane LLCs

Maiden Lane LLC: A limited liability company (in DE) that purchased Bear Stearns assets (as part of the deal whereby JPMC took over Bear Stearns).
$28.8B senior loan from the NY Fed, and $1.15B subordinate loan from JPMorgan Chase.

Maiden Lane II LLC: Purchased residential mortgage-backed securities from subsidiaries of the American International Group.

Maiden Lane III LLC: Purchased collateralized debt obligations (CDOs) from counterparties the AIG Financial Products Corp

- limited liability companies created by the NY Fed in 2008
- named after street beside NY Fed
- Fed's stake appeared on the Fed's balance sheet until fully sold off in 2018 (at a $2.5 billion profit)
  - appeared as loans to the ML LLCs

Source: http://www.newyorkfed.org/markets/maidenlane.html

Monetary Authority: Simplified Balance Sheet

Assets		Liabilities	
Domestic Assets	$6,000	Reserves	$4,000
Foreign Assets	$500	Currency	$2,500

International Capital Markets

- Foreign currency deposits and foreign government bonds are rough substitutes
  - both are fairly liquid assets denominated in foreign currency
  - MAs trade foreign government bonds in the international capital markets
- MA purchases or sales of foreign currency deposits and foreign government bonds
  - influence the money supply
  - $\rightarrow$ influence the exchange rate
  - (may have other effects; postponing discussion)

Open Market Purchase

Assets		**Liabilities**	
Domestic Assets	+$500	Reserves	+$500
Foreign Assets		Currency	

Foreign Bond Purchase

Assets		**Liabilities**	
Domestic Assets		Reserves	+$500
Foreign Assets	+$500	Currency	

Sterilization

- Purchase or sale of foreign bonds
  - $\rightarrow$ change in money supply
- Sale or purchase of domestic bonds
  - $\rightarrow$ restore money supply

Sterilized Foreign Bond Purchase

Assets		**Liabilities**	
Domestic Assets	-$500	Reserves	+$0
Foreign Assets	+$500	Currency	

Fixed Exchange Rates

Rules of the game:

- buy or sell as much FX as needed to peg E at stated parity
- control E; give up control of M

Fixed Exchange Rates: Interest Parity

FX equilibrium is still interest parity:

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

Assume a **credible** fixed parity:

$$E^e = E \implies R = R^*$$

Money market equilibrium becomes:

$$M/P = L[R^*, Y]$$

Fixed exchange rate: MA must allow M to move so that $R = R^*$.

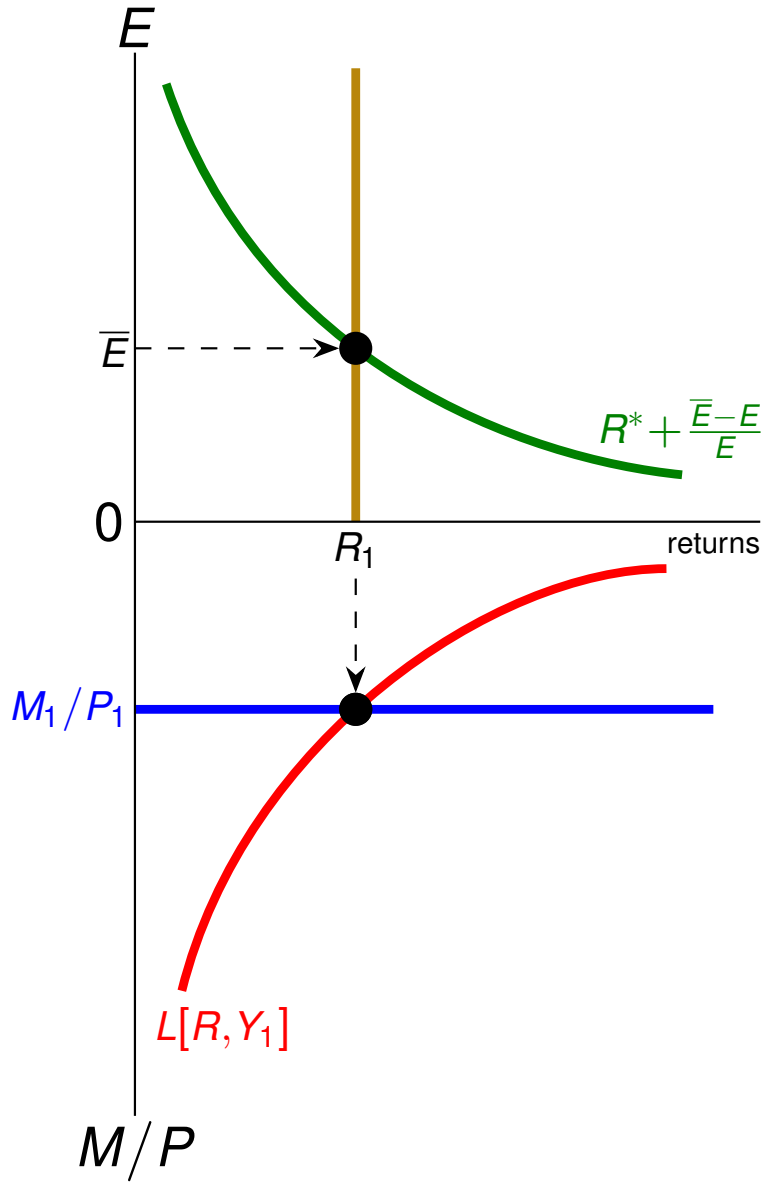
↑Y under Fixed Rates

↑Y $\rightarrow$ ↑L $\rightarrow$ upward pressure on R $\rightarrow$ currency pressured to appreciate

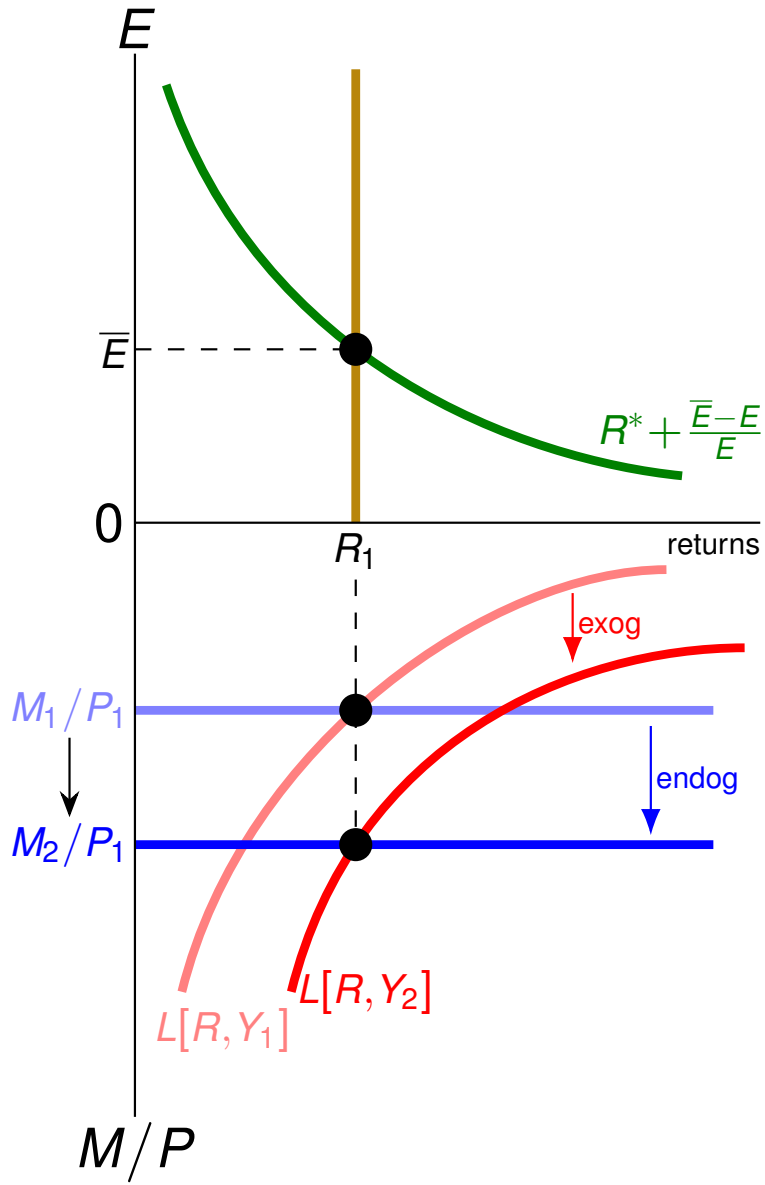
How can the monetary authority mantain fixed parity?

- buy foreign assets in the foreign exchange markets
  - ↑NFA $\rightarrow$ ↑H $\rightarrow$ ↑M
  - $\rightarrow$ eliminate the pressure on R and E

Fixed Exchange Rate: Two-Part Chart



↑Y (Fixed Exchange Rate)

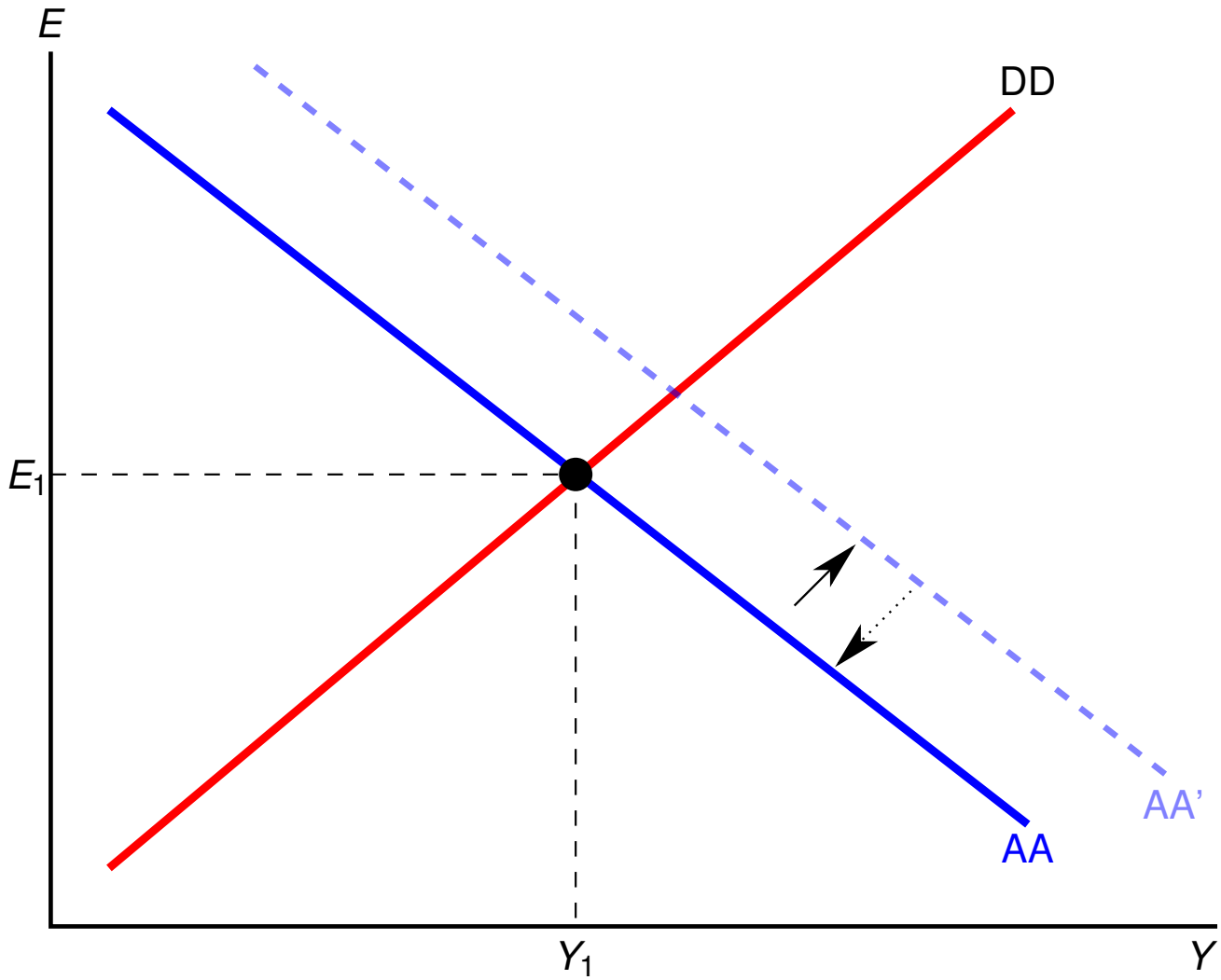


$Y_2 > Y_1$, $M_2 > M_1$

Fixed Exchange Rate Constrains Monetary Policy

- the monetary authority must buy and sell foreign assets to maintain the parity
- this requires maintaining $R = R^*$
- $\rightarrow$ MA cannot adjust R to attain other goals.
  - monetary policy cannot be used to manipulate output and employment.

Monetary Policy Is Ineffective Under a Fixed Exchange Rate



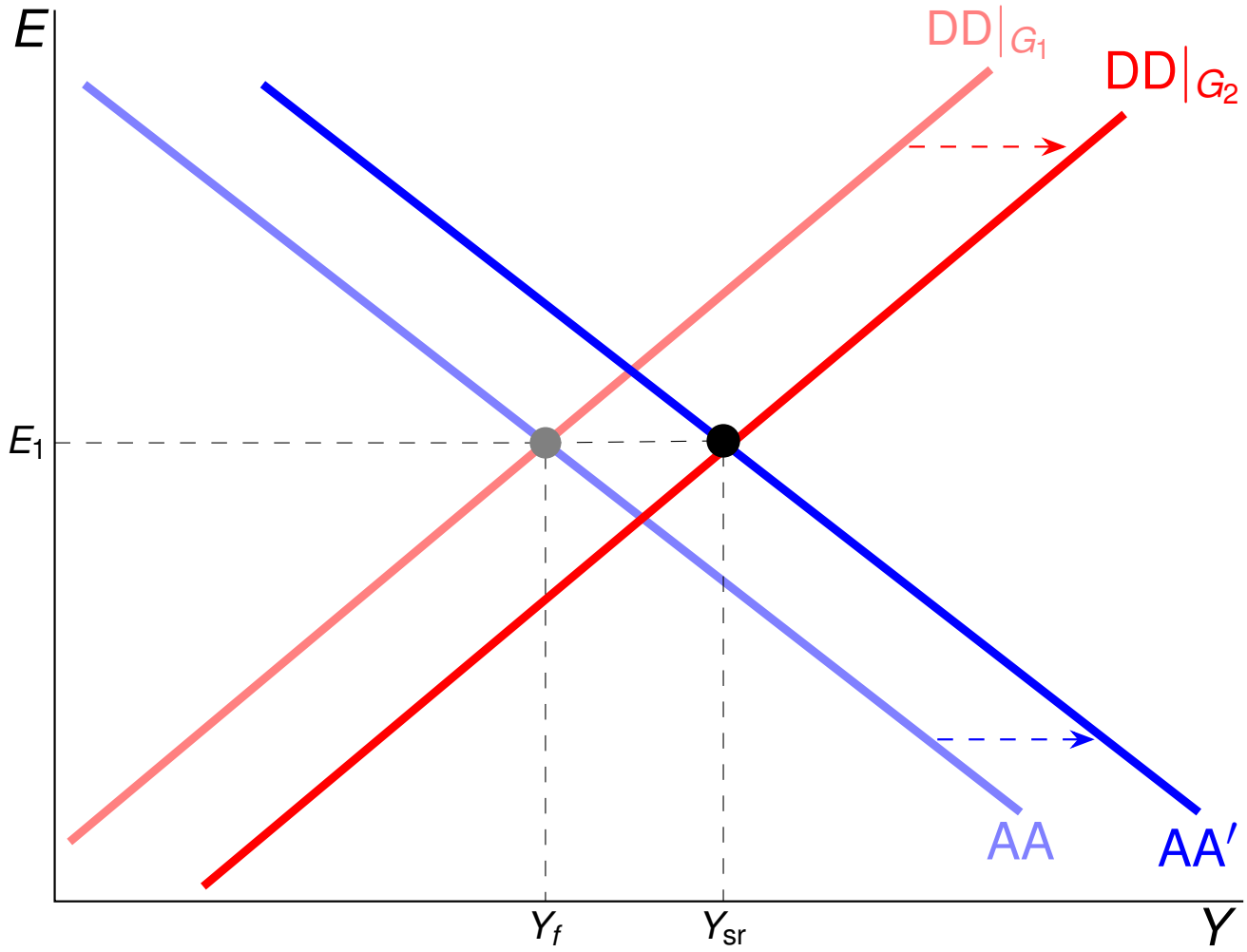
Compare KOMIF Figure 7-2 (KOM 18-2)

Fiscal Policy in the Short Run (Fixed Exchange Rates)

Temporary changes in fiscal policy can influence SR output andemployment

- $\uparrow G \rightarrow \uparrow AD \rightarrow \uparrow Y$
- $\rightarrow \uparrow L \rightarrow \uparrow R \rightarrow$ pressure (to appreciate) on domestic currency.
- To prevent appreciation, the domestic monetary authority buys foreign assets, thereby supplying the desired liquidity
- interest rates end up unchanged

Fiscal Expansion (SR, Fixed E)



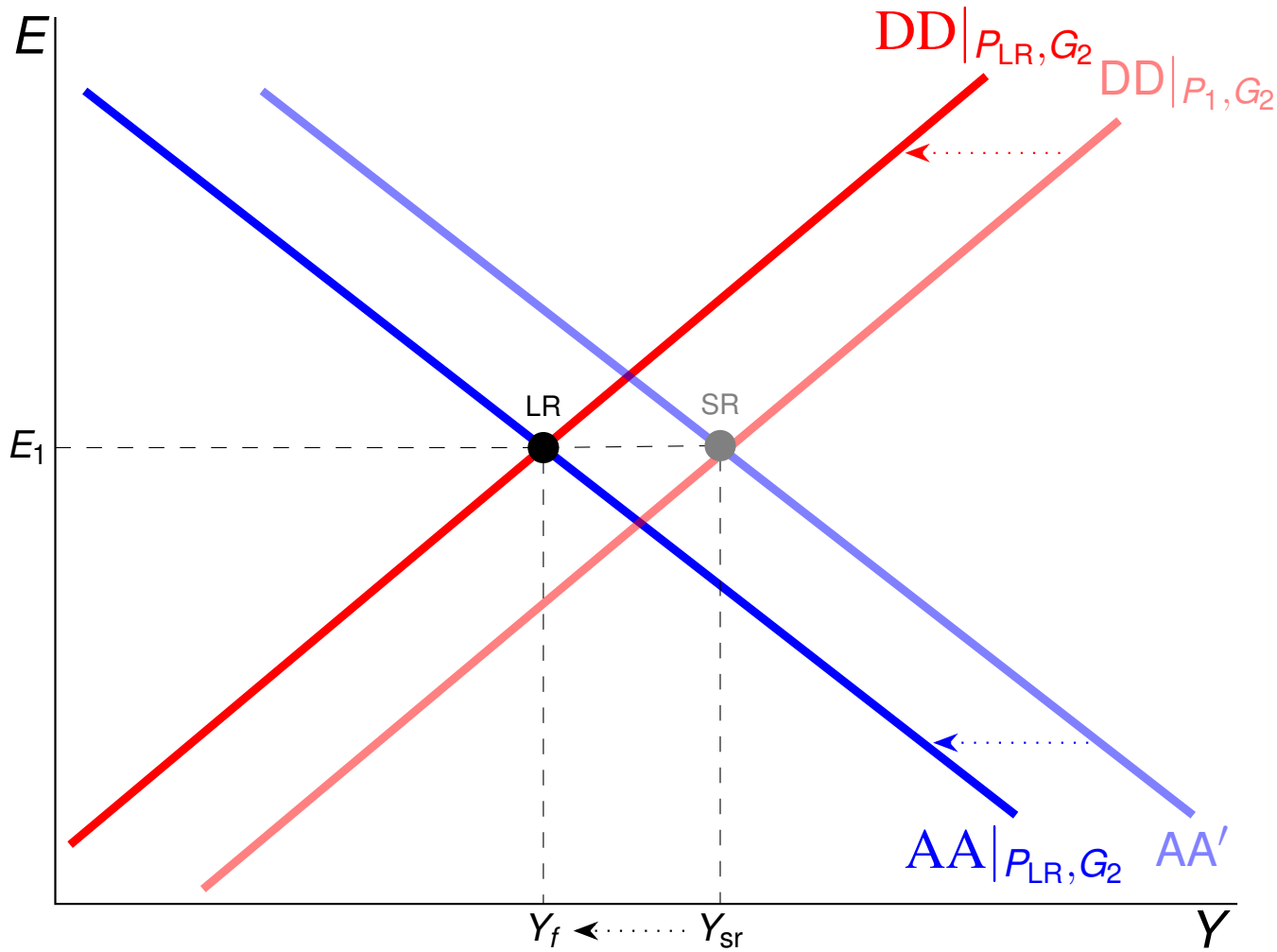
$G_2 > G_1$. Compare KOMIE Figure 18-3 (KOMIE 7-3)

Permanent Fiscal Expansion in the Long Run

Fixed Exchange Rate

- $\uparrow$G $\rightarrow$ $\uparrow$D $\rightarrow$ $\uparrow$Y
  - full multiplier effect (because E does not change)
  - DD shifts right
- starting at $Y = Y_f$, we get $Y > Y_f$ in SR
  - $\rightarrow$ wages and prices begin to rise
  - $\uparrow$P $\rightarrow$ $\downarrow$EP*/P (i.e., $\downarrow$q; real appreciation; domestic products more expensive)
    - $\rightarrow$ $\downarrow$D so DD curve shifts left
    - $\uparrow$P continues until $Y = Y_f$

Permanent Fiscal Expansion (LR Effects; Fixed E)



$P_{LR} > P_1$: rising P crowds out SR effects.

Permanent Fiscal Expansion in the Long Run: AA Shifts

AA shifts are endogenous

Short run: AA must shift right (↑M) to prevent appreciation

Long run: AA must shift back to prevent depreciation

M/P returns to original level (with final ↑M proportional to ↑P)

Fiscal Expansion: Fixed Exchange Rate vs. Float

With a successfully fixed E, a fiscal expansion now gives us

- no $\downarrow$q in SR
- $\uparrow$P instead of $\downarrow$E in the LR
- E^e does not change
- **AA cuve** shifts **up** in SR (because of $\uparrow$M)
  returns to original location in LR
- still get $\downarrow$q in LR
- still get twin deficits

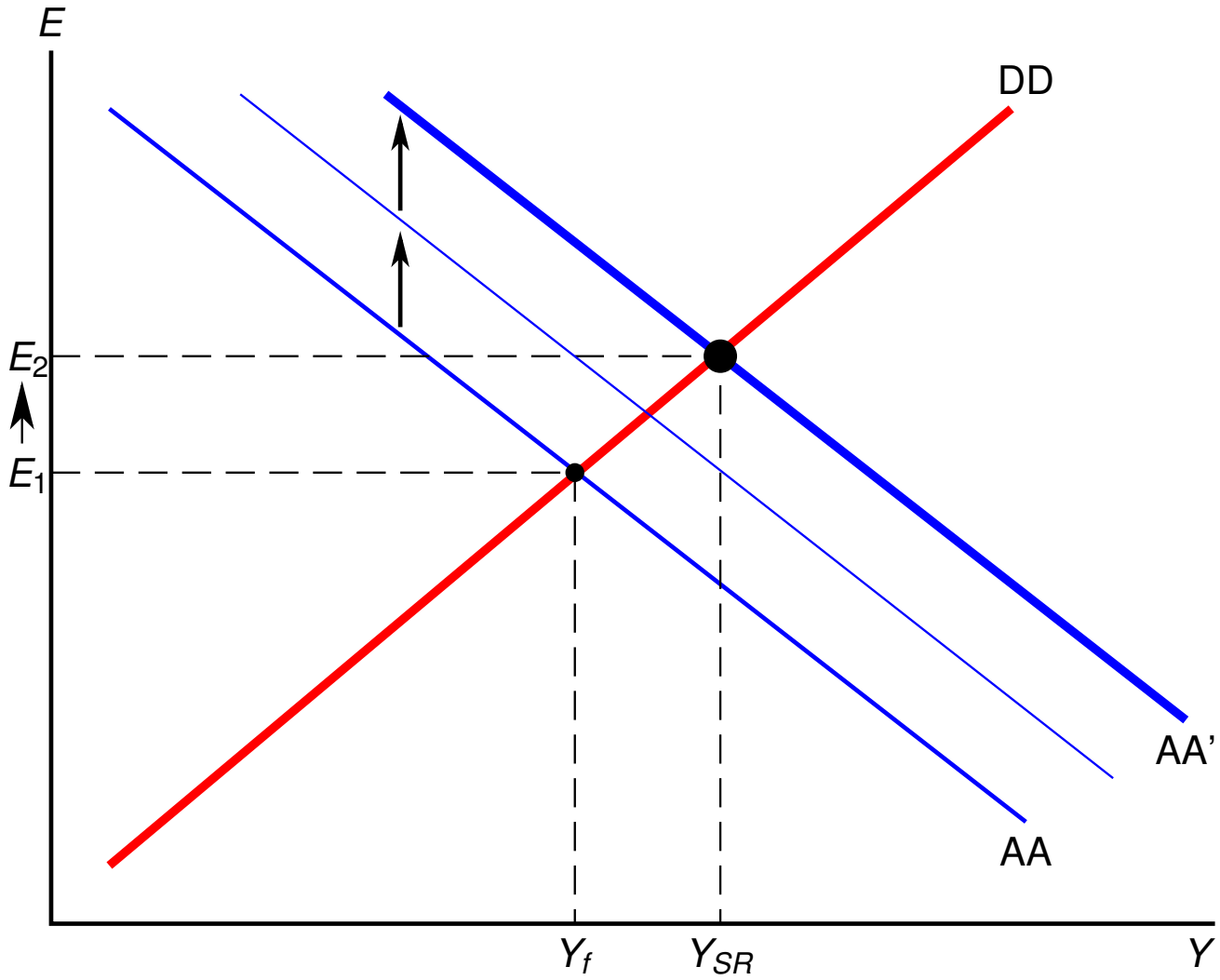
Devaluation and Revaluation

Devaluation: MA intentionally depreciates the currency ($\uparrow$E)

Revaluation: MA intentionally appreciates the currency ($\downarrow$E)

- Depreciation and appreciation generally signify changes in the value of a currency due to market changes.
- Devaluation and revaluation signify the **same** exchange rate changes, but as a change in the peg of a fixed exchange rate

Currency Devaluation (SR Effects)



Compare KOMIF Figure 7-4 (KOM 18-4)

Effects of Devaluation

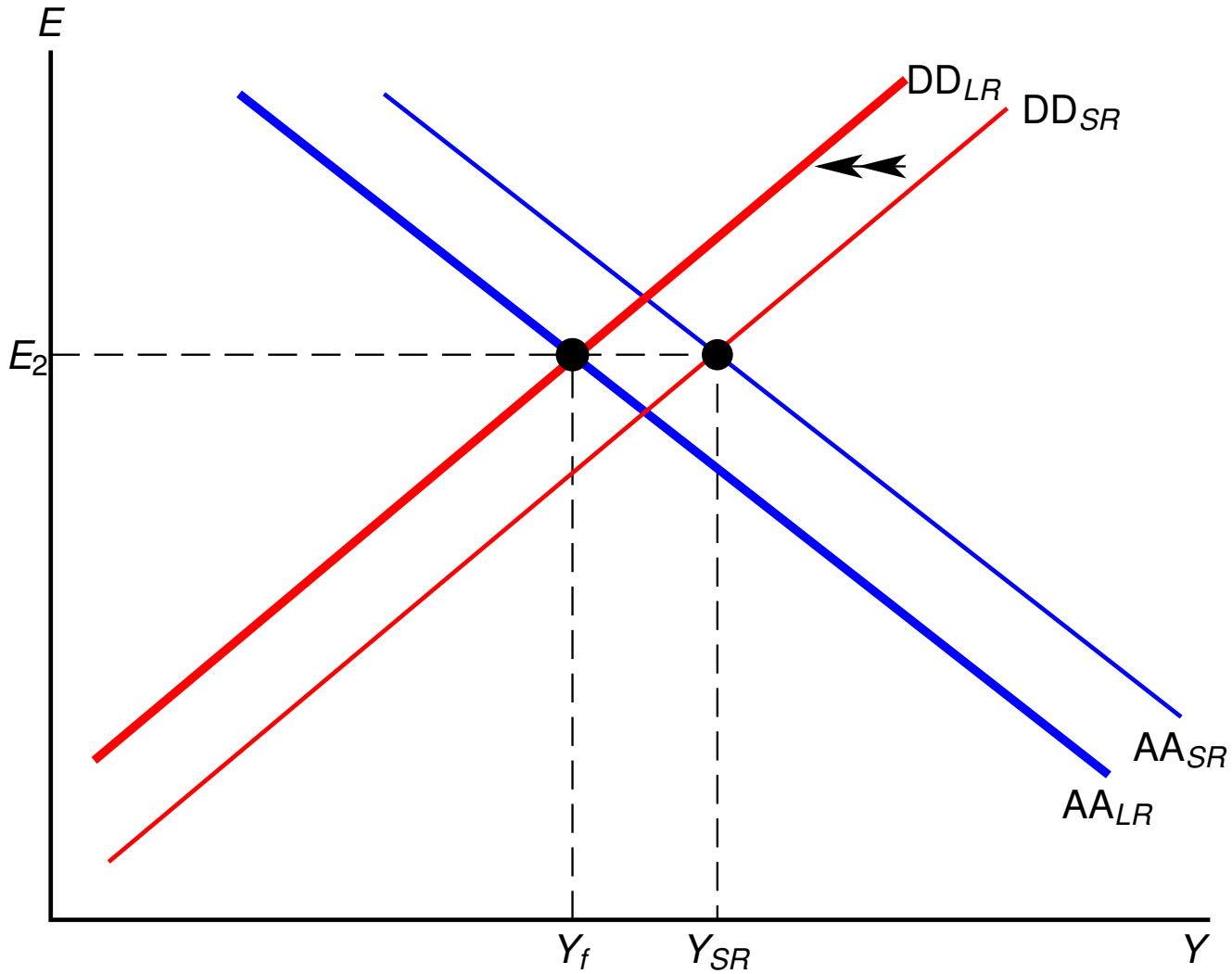
SR Effects

- AD expansion (e.g., fight unemployment)
- CA improvement (assuming ML condition)
- improves monetary authorities reserve position

LR Effects

- depend on starting position
- start from $Y = Y_f \rightarrow$ no LR effect except inflation
  - increase in P proportional to increase in E
  - devaluation is "neutral" in the LR
- start from $Y < Y_f \rightarrow$ can restore LR eq $\rightarrow$ no subsequent adjustment

Currency Devaluation (LR Effects)



Financial Crises and Exchange-Rate Pegs

Under the "rules of the game" for a pegged E, the MA must be able to supply FX to meet any demand at the official peg.
Stylized balance of payments crisis:

- balance of payments problems
- $\rightarrow$ loss of FX reserves
- $\rightarrow$ speculators believe the MA lacks adequate FX reserves to maintain the peg
- $\rightarrow$ devaluation looks inevitable
- $\rightarrow$ investors and speculators sell domestic for foreign assets (anticpating a capital gain)
- $\rightarrow$ FX reserves drained even more quickly

The expectation of devaluation exacerbates the balance of payments crisis! (This might even produce a **self-fulfilling prophecy**.)

Financial Crises and Capital Flight

capital flight: private financial capital shifts from domestic assets to foreign assets

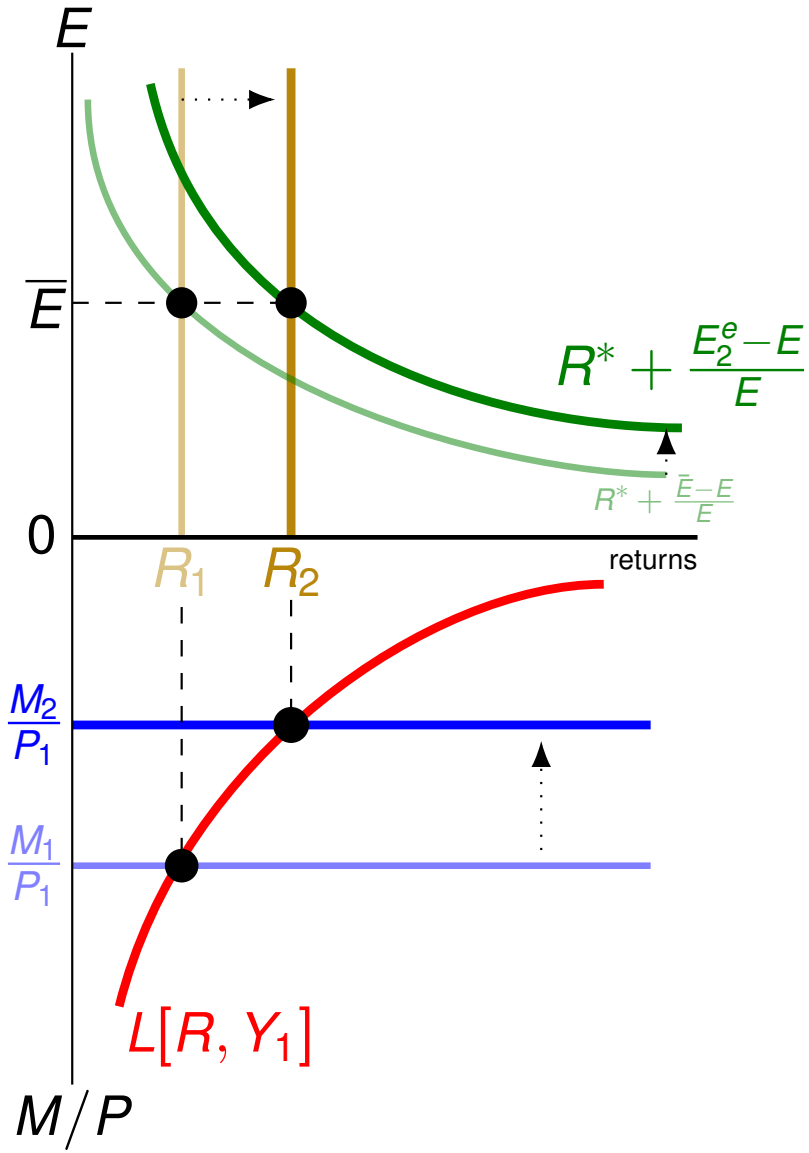
domestic assets must offer a higher interest rate (to offset expected depreciation)

the monetary authority is forced to $\uparrow$R (via $\downarrow$M by selling assets, esp. FX)

Results: $\uparrow$R, $\downarrow$M

Extended results: $\downarrow$ aggregate demand, $\downarrow$ Y, $\uparrow$ unemployment.

Capital Flight in Response to "Devaluation Scare"



$E_2^e > \bar{E}$, $R_1 = R^*$, $R_2 = R^* + (E_2^e - E)/E$

Compare KOMIF Figure 7-5 (KOM 18-5)

Financial Crises and Capital Flight

An anticipated devaluation can exaccerbate a balance of payments crisis.

anticipate devaluation when:

- monetary authority not seen as abile or willing to defend the parity
- $\downarrow$Ex (so that the domestic currency should become less valuable)
- credible speculative attack

self-fulfilling prophecy:

- expected devaluation can even force a devaluation

Financial Crises and Capital Flight (cont.)

When the monetary authority runs out of reserve assets:

- it can no longer intervene in the FX market by selling FX
- it must devalue the domestic currency
- devaluation then
  - raises E (ideally to E^e)
  - $\rightarrow \downarrow$R
  - $\rightarrow$ increasing the money supply ($\uparrow$M $\rightarrow \uparrow$M/P)
  - $\rightarrow$ stops the FX outflow

extended analysis:

- devaluation should (soon) $\uparrow$D $\rightarrow \uparrow$Y

Interest Rate Differentials

For many countries: $R \neq R^*$. Why?

our current answer: $E^e \neq E$

I.e., we still expect interest parity: $R = R^* + (E^e - E)/E$

But many countries appear to violate uncovered interest parity. Why?

possible answer:

- investors are not risk neutral; *exchange risk* matters
- foreign and domestic assets are not perfect substitutes
- default risk: the risk that the country's borrowers will default

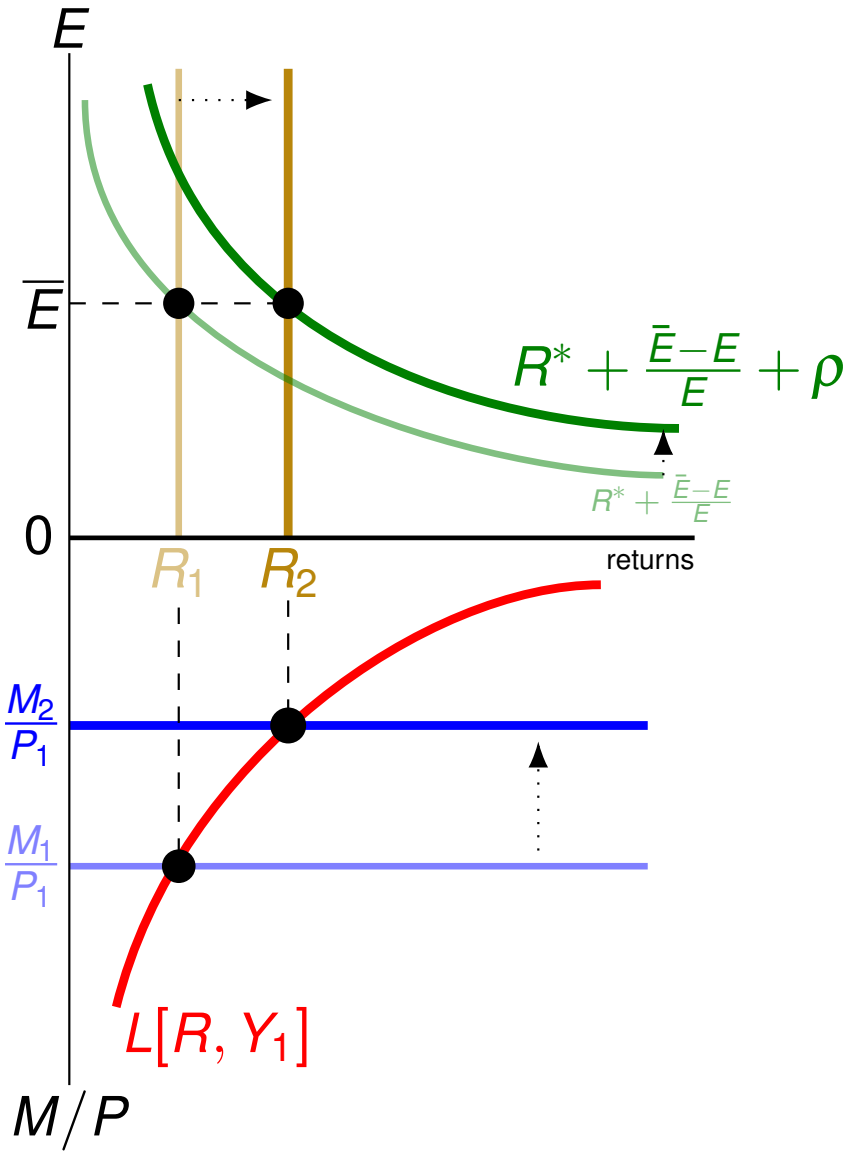
Risk Premium

A difference in the risk of domestic and foreign assets is one reason why expected rates of return are not equal across countries:

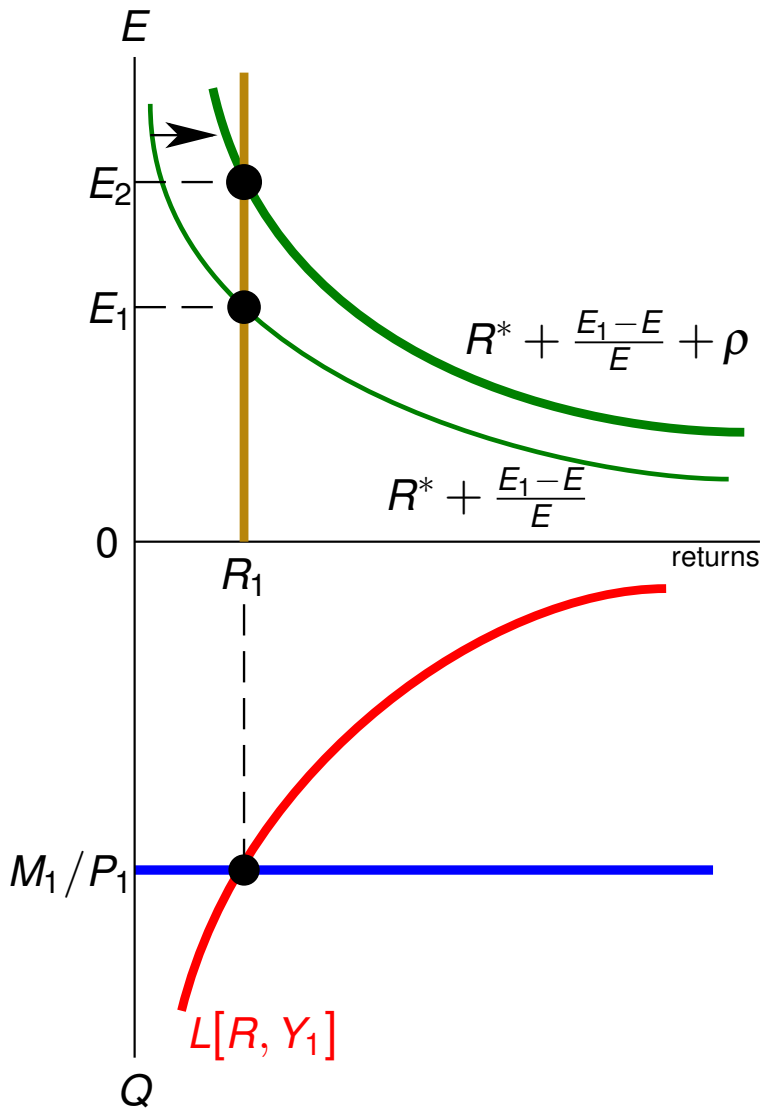
$$R = R^* + \frac{E^e - E}{E} + \rho$$

Here ρ is called a *risk premium*, an additional amount needed to compensate investors for investing in risky domestic assets.

Increase in Perceived Risk (SR Effect; Fixed E)



Temporary Increase in Perceived Risk (SR Effect; Flex E)



Limitation of this analysis: fixed E^e.

CASE STUDY: The Mexican Peso Crisis, 1994 - 1995

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- In late 1994, the Mexican central bank devalued the value of the peso relative to the U.S. dollar.
- This action was accompanied by high interest rates, capital flight, low investment, low production and high unemployment.
- What happened?

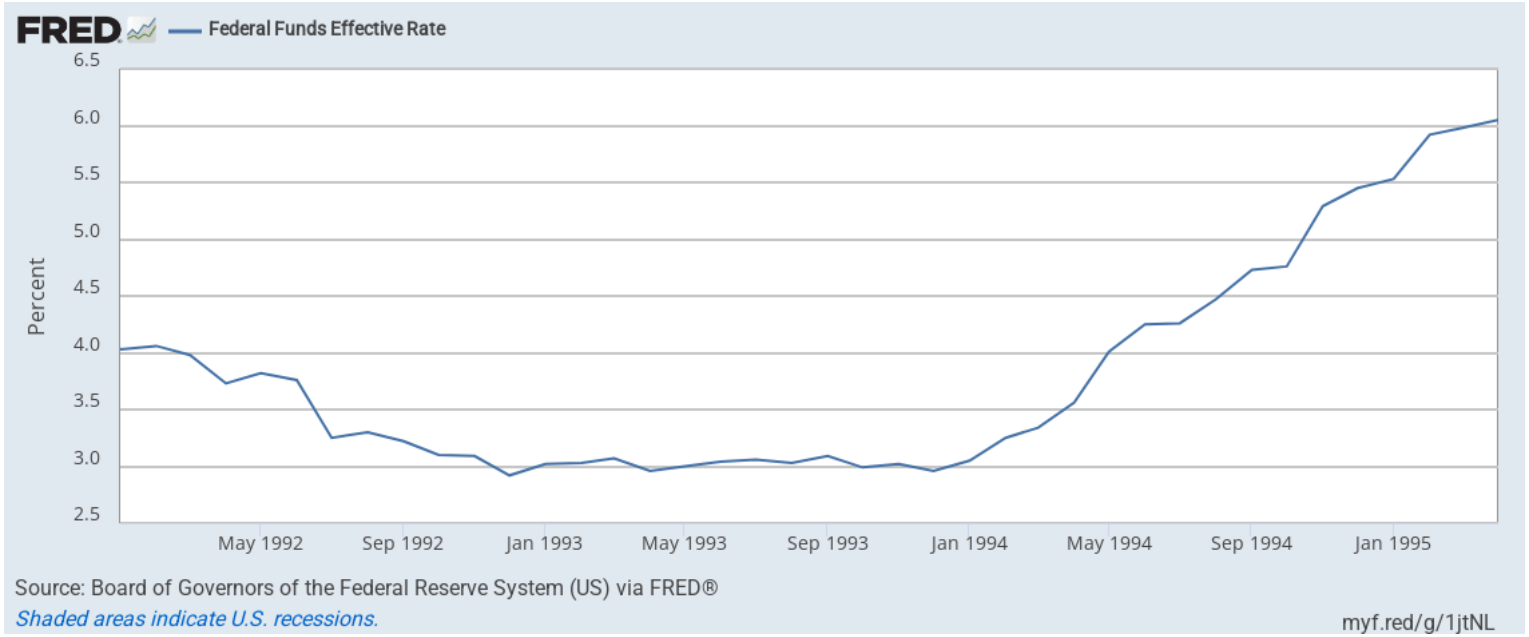
CASE STUDY: The Mexican Peso Crisis, 1994 - 1995

Early 1990s: Mexico was an attractive place for foreign investment, especially from NAFTA partners.
NAFTA went into effect Jan 1, 1994).
During 1994, political developments caused an increase in Mexico's risk premium (rho) due to increases in default risk and exchange rate risk:

- Jan 1, 1994: Chiapas rebellion begins
- March 23, 1994: assassination of the PRI presidential candidate (Luis Colosio)
- Sep 28, 1994: assassination of another leading PRI politician (José Francisco Ruiz Massieu)

Also: nasty rumors abound . . .

US Monetary Policy around the Peso Crisis



CASE STUDY: The Mexican Peso Crisis, 1994 - 1995

These events put downward pressure on the value of the peso.

- Mexico's central bank had promised to maintain the fixed exchange rate.
- To do so, it sold dollar denominated assets, decreasing the money supply and increasing interest rates.
- To do so, it needed to have adequate reserves of dollar denominated assets. Did it?

U.S. Dollar Denominated International Reserves at the Mexican Central Bank

January 1994	$27 billion
October 1994	$17 billion
November 1994	$13 billion
December 1994	$6 billion

During 1994, Mexico's central bank hid the fact that its reserves were being depleted. Why?
Source: KO 8 (Data Source: Banco de México,http://www.banxico.org.mx)

CASE STUDY: The Mexican Peso Crisis, 1994 - 1995

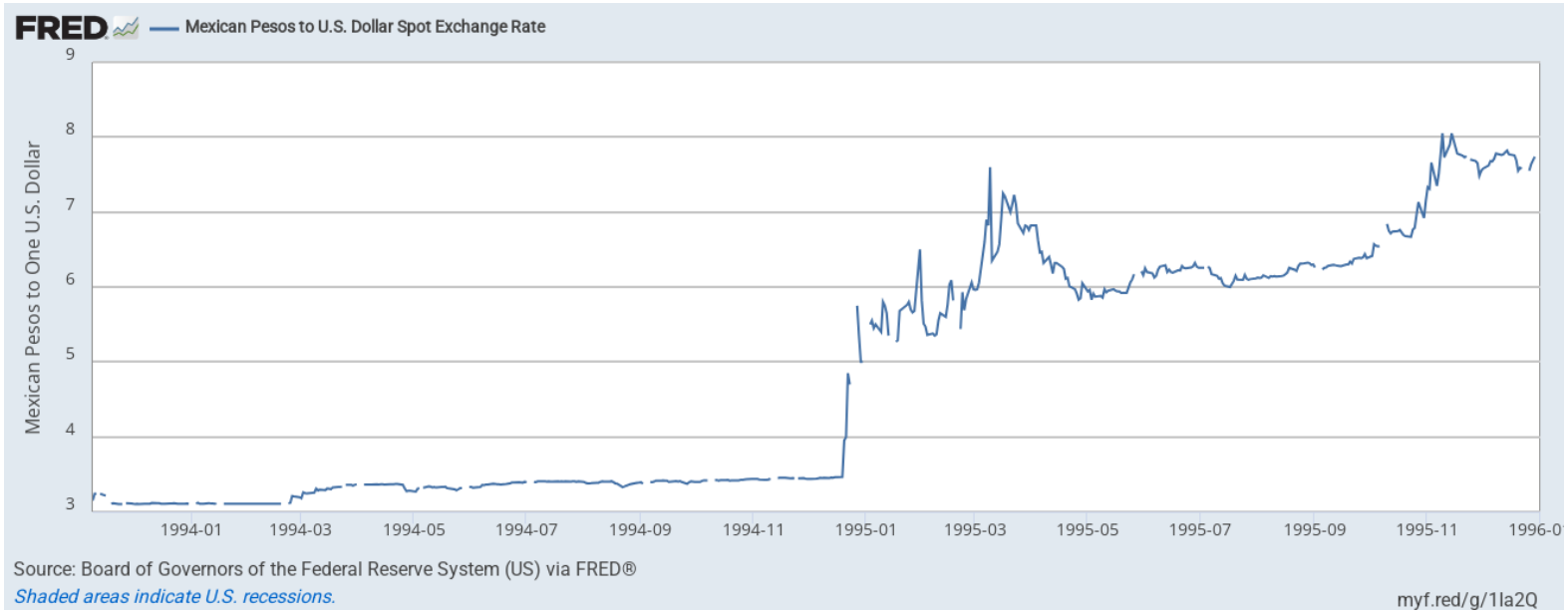
20 Dec 1994: Mexico devalues the peso by 13% and fixes E at 4.0 pesos/dollar instead of 3.4 pesos/dollar.

- Investors expect that the central bank has depleted its reserves.
- risk premium (ρ) rises further due to increase in perceived risk
- E^e rises: investors expect the central bank to devalue again and they sell Mexican assets, putting more downward pressure on the value of the peso.

22 Dec 1994: with reserves nearly gone, the central bank abandons the fixed rate.

- In a week, the peso falls another 30% to about 5.7 pesos/dollar.

The Mexican Peso Crisis, 1994 - 1995



Source: FRED

The Rescue Package: Reducing rho

The U.S. & IMF set up a $50 billion fund to guarantee the value of loans made to Mexico's government,

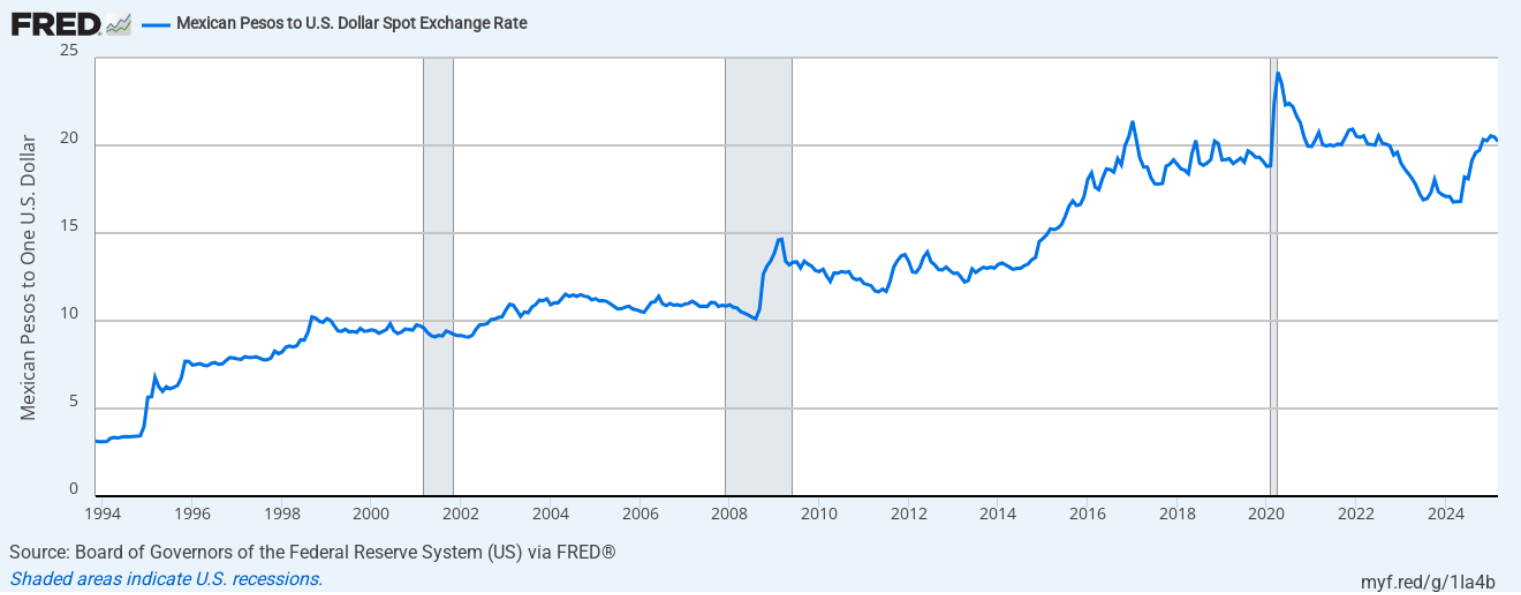
- reducing default risk,
- and reducing exchange rate risk, since foreign loans could act as official international reserves to stabilize the exchange rate if necessary.

After a recession in 1995, the economy began to recover.

- Mexican goods were relatively inexpensive, allowing production to increase.
- Increased demand for Mexican products relative to demand for foreign products stabilized the value of the peso and reduced exchange rate risk.

Other Troubles

USD-MXN Since 1994



Source: FRED series EXMUS

Note: monthly data hides a lot of the action

Aside: note effects of covid:

https://fred.stlouisfed.org/graph/?g=12hDM

Summary

1. Changes in a central bank's balance sheet lead to changes in the domestic money supply.
   - Buying domestic or foreign assets increases the domestic money supply.
   - Selling domestic or foreign assets decreases the domestic money supply.
2. When markets expect exchange rates to be fixed, domestic and foreign assets have equal expected returns if they are treated as perfect substitutes.

Summary (cont.)

3. Monetary policy is ineffective in influencing output or employment under fixed exchange rates.
4. Temporary fiscal policy is more effective in influencing output and employment under fixed exchange rates, compared to under flexible exchange rates.

Summary (cont.)

5. A balance of payments crisis occurs when a central bank does not have enough official international reserves to maintain a fixed exchange rate.
6. Capital flight can occur if investors expect a devaluation, which may occur if they expect that a central bank can no longer maintain a fixed exchange rate: self-fulfilling crises can occur.
7. Domestic and foreign assets may not be perfect substitutes due to differences in default risk or due to exchange rate risk.

Summary (cont.)

8. Under a reserve currency system, all central banks but the one who controls the supply of the reserve currency trade the reserve currency to maintain fixed exchange rates.
9. Under a gold standard, all central banks trade gold to maintain fixed exchange rates.

Appendices

Exchange Rate Mechanism (ERM)

1957: European Economic Community (EEC)

- Treaty of Rome $\rightarrow$ EEC (common mkt and customs union)
- 1993: renamed EC (incorporated in EU); 2009: EC ends

1979 (March): establish European Monetary System (EMS)

- define the ECU as accounting unit (a basket of currencies; ISO code: XEU)
- establish an exchange rate mechanism (ERM-I)
- semi-peg (i.e., inside band) to ECU
- most of EEC participates
- Goals
  - Reduce exchange rate variability
  - Prepare for European Monetary Union (EMU)

Britain and ERM-I

1979: UK declines to join ERM-I; pound immediately appreciates

1990-10-08: UK enters ERM; GBP-DEM 2.95

1992: currency speculation against pound

- UK raises interest rates; spends billions trying to adhere to mechanism
- Soros alone is estimated to have USD 1B in profits

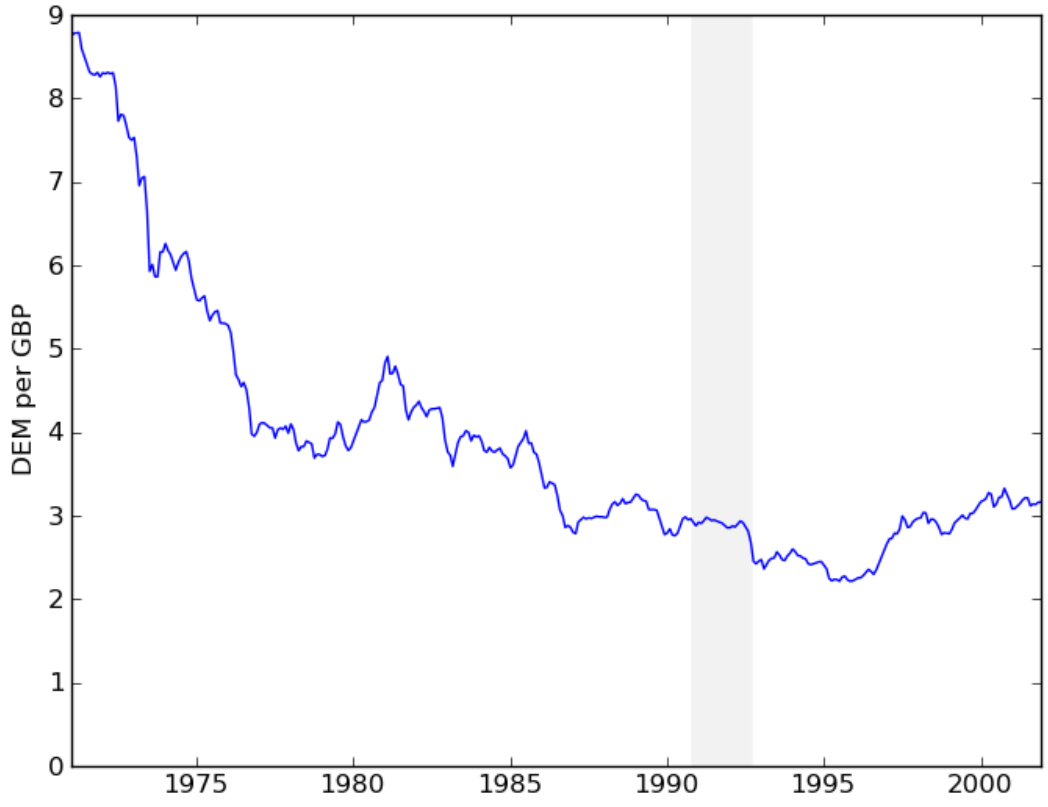
1992-09-16: UK withdraws from ERM

- UK economic performance improved after withdrawal
- (ERM dubbed “eternal recession mechansim”)

1997: pound rallies

- passes 1990 level!

Britain and the ERM-I



France

- 1993 speculation against franc fails
  - But: band enlarged due to pressure

Eurozone

1999-01-01: end of ERM-I

- euro (ISO code: EUR) replaces ECU at 1:1
- the **euro area** (eurozone) comes into existence: euro adopted for accounting by 11 initial eurozone countries
  - those that met the convergence criteria:
  - Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain

2002 (Jan 1)

- euro notes and coins enter circulation

ERM-II and the euro

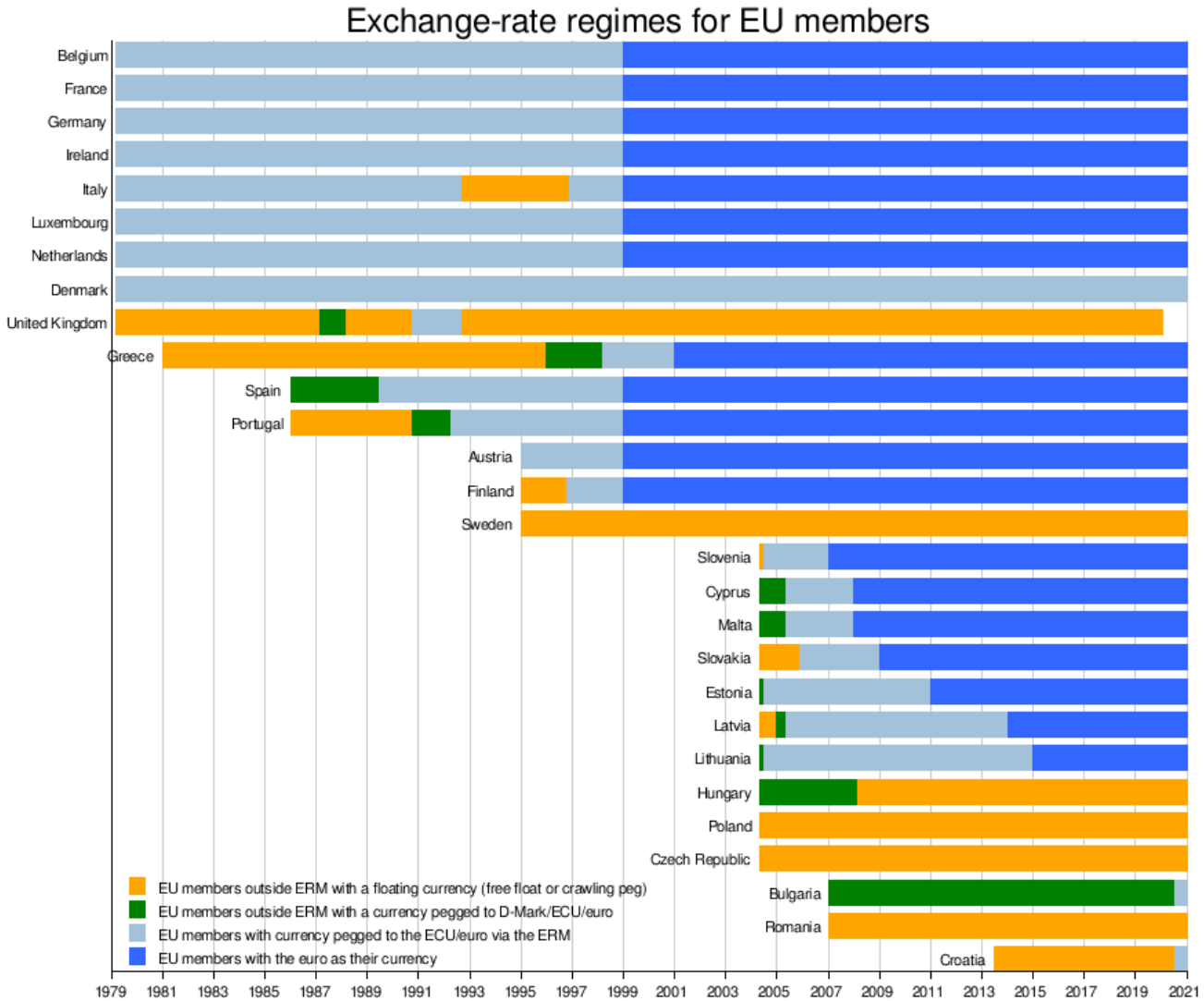
1999-01-01: start of ERM-II

- Greece and Denmark semi-pegged to euro
  - (central rate plus or minus 15%, or less)
- Goal: transition to euro
  - Two year stability test
  - Countries leave ERM-II when adopt euro
    Greece (2001), Slovenia (2007), Cyprus (2008), Malta (2008), Slovakia (2009)

2004 and 2005

- smaller new EU member countries join ERM-II

Exchange-Rate Regimes for EU Members



Source: https://en.wikipedia.org/wiki/European_Exchange_Rate_Mechanism

Greek Debt Crisis of 2011

- Greek debt crisis emerges in 2011, leading to talk of Greece leaving the euro, and concerns about a debt crisis in Spain and Italy
- so-called euro package
  - proposed ammendment to euro treaties to impose fiscal discipline
  - addition resources for European Financial Stability Facility (EFSF)
  - IMF support for the EFSF
  - political support fore the ECB to keep buying Italian and Spanish bonds

Monetary Arrangements

https://www.imf.org/en/Publications/Annual-Report-on-Exchange-Arrangements-and-Exchange

Monetary Arrangements

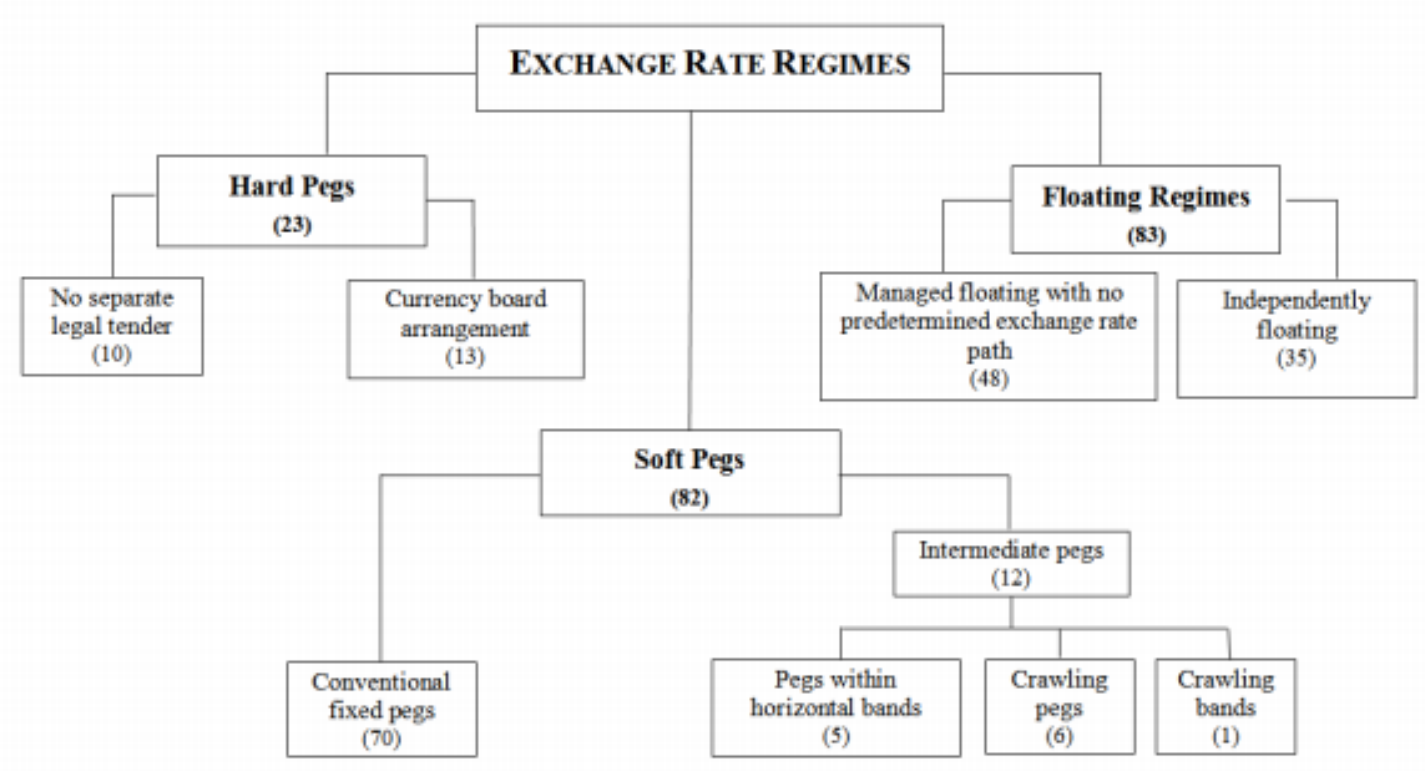
Monetary Arrangements, as of Year End 2005

	Countries and Places		GDP		Population	
	Number	%	Billions PPP $	%	Millions	%
U.S. dollar	45	21.0	13206	24.1	658	10.5
U.S.	1	0.5	11628	21.2	294	4.7
Dollarized or hard peg	27	12.6	426	0.8	37	0.6
Other dollar pegs	17	7.9	1152	2.1	327	5.2
Euro area	58	27.1	12284	22.4	584	9.3
Euro proper	12	5.6	8638	15.8	307	4.9
EU members not in ERM-I	3	1.4	2270	4.1	74	1.2
Accession countries	10	4.7	1093	2.0	74	1.2
Other euroized or hard peg	33	15.4	283	0.5	128	2.0
Sovereign currency without fixed peg to dollar or euro	111	52.0	29328	54	5048	80
China	1	0.5	7124	13.0	1297	20.6
Japan	1	0.5	3774	6.9	128	2.0
India (w/ Bhutan)	2	0.9	3363	6.1	1080	17.2
Brazil	1	0.5	1483	2.7	179	2.8
Other sovereign:	106	49.5	13584	24.8	2365	37.6
Foreign currency deposits						
> 50% of total deposits	(22)	(10.3)	(1749)	(3.2)	347	5.5
Other	(84)	(39.3)	(11835)	(21.6)	2018	32.1
Total	214	100.0	54818	100.0	6289	100.0

Monetary Arrangements 2007

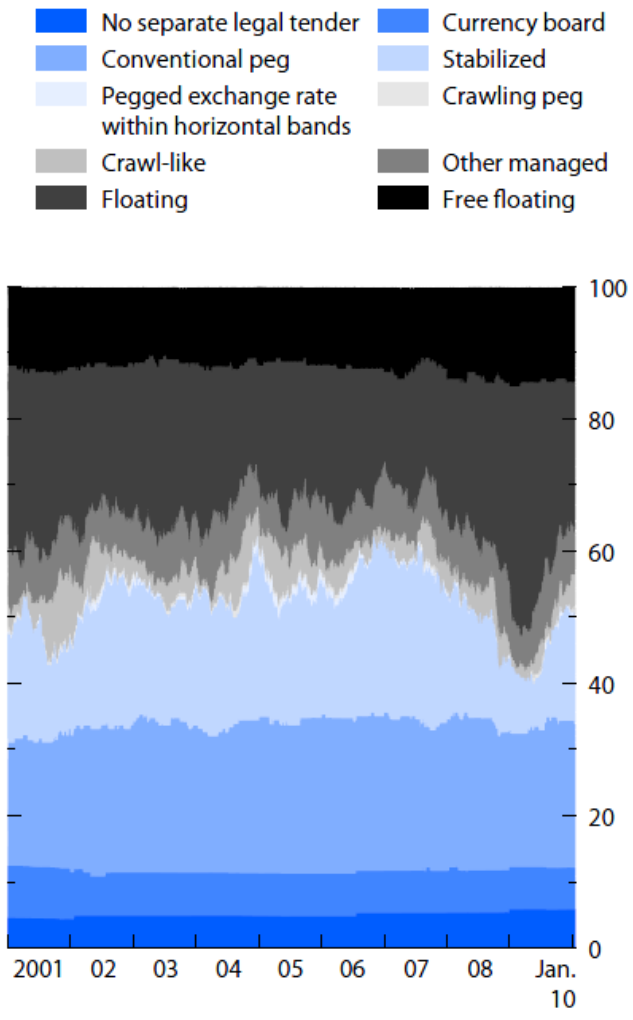
Figure 1. De Facto Exchange Rate Arrangements 1/

(Number of countries, end-April 2007)



Source: *Annual Report on Exchange Arrangements and Exchange Restrictions* database.

Exchange Rate Classifications 2001–2009



Source: http://www.imf.org/external/pubs/ft/weo/2010/01/index.htm

Exchange Rate Classifications 2008–2014

Table 2. Exchange Rate Arrangements, 2008–13

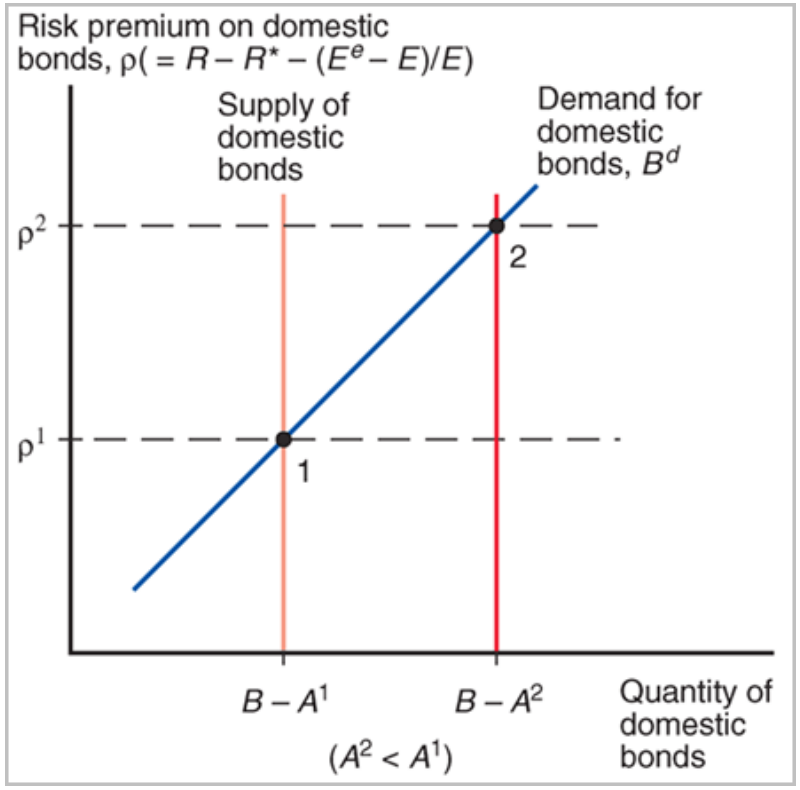
(Percent of IMF members as of April 30 each year)[1]

Exchange Rate Arrangements	2008[2]	2009[3]	2010[4]	2011[5]	2012[5]	2013
Hard pegs	12.2	12.2	13.2	13.2	13.2	13.1
No separate legal tender	5.3	5.3	6.3	6.8	6.8	6.8
Currency board	6.9	6.9	6.9	6.3	6.3	6.3
Soft pegs	39.9	34.6	39.7	43.2	39.5	42.9
Conventional peg	22.3	22.3	23.3	22.6	22.6	23.6
Stabilized arrangement	12.8	6.9	12.7	12.1	8.4	9.9
Crawling peg	2.7	2.7	1.6	1.6	1.6	1.0
Crawl-like arrangement	1.1	0.5	1.1	6.3	6.3	7.9
Pegged exchange rate within horizontal bands	1.1	2.1	1.1	0.5	0.5	0.5
Floating	39.9	42.0	36.0	34.7	34.7	34.0
Floating	20.2	24.5	20.1	18.9	18.4	18.3
Free floating	19.7	17.6	15.9	15.8	16.3	15.7
Residual						
Other managed arrangement	8.0	11.2	11.1	8.9	12.6	9.9

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions 2014 https://www.imf.org/external/pubs/nft/2014/areaers/ar2014.pdf

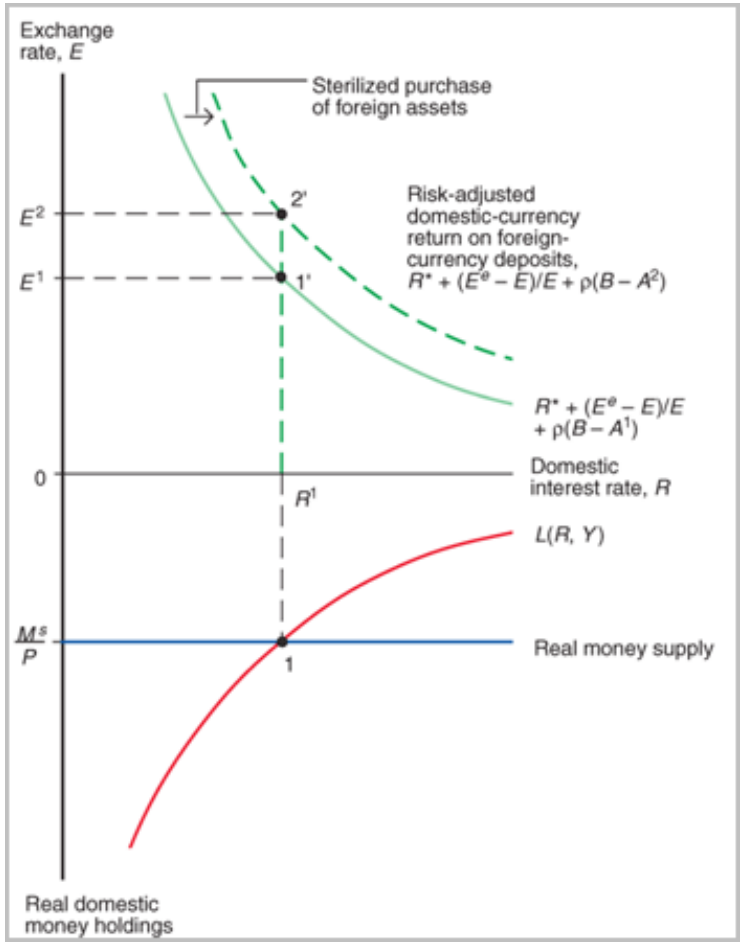
Appendix: Imperfect Substitutability

The Domestic Bond Supply and the Foreign Exchange Risk Premium Under Imperfect Asset Substitutability



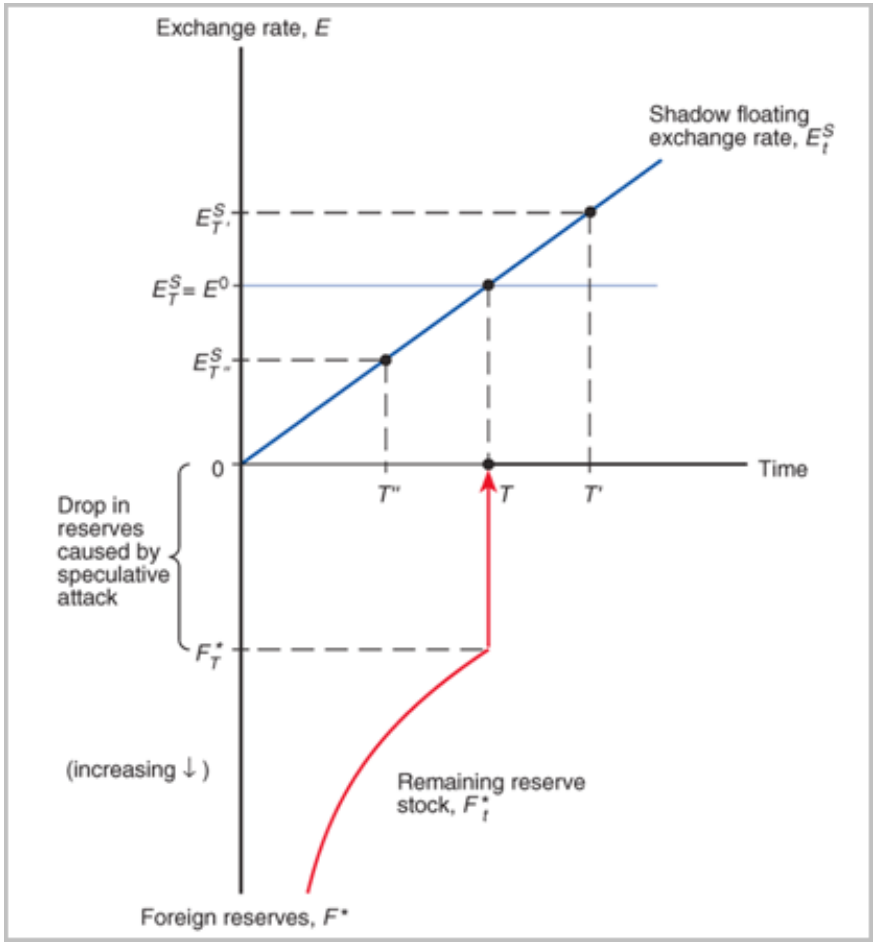
Source: KOMIF 11 Figure 7A1-1

Effect of a Sterilized Central Bank Purchase of Foreign Assets Under Imperfect Asset Substitutability



Compare: KOMIF Figure 7-7

How the Timing of a Balance of Payments Crisis Is Determined



Source: KOMIF 11 Figure 7A2-1

Appendix: Demand for International Reserves

Demand for International Reserves

The dollar remains the primary reserve currency.
Why bother holding international reserves? In a fixed exchange rate system, under the rules of the game, one could always get them when needed.

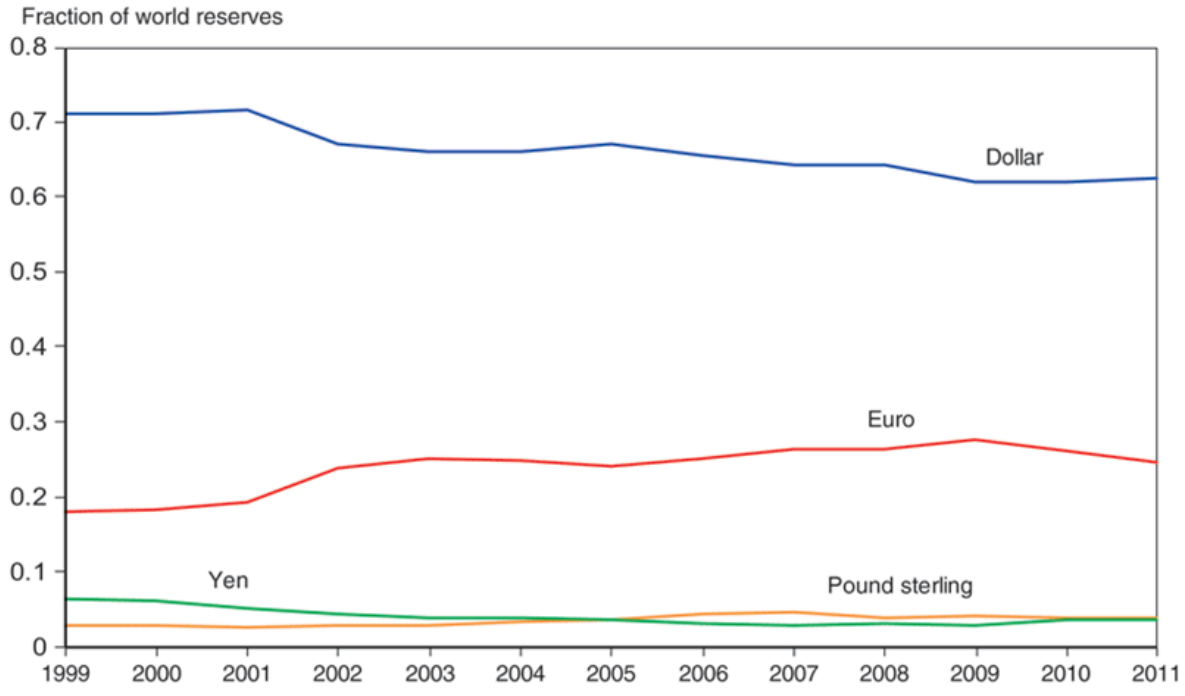
- sell domestic assets
- foreign assets flow in at fixed exchange rate (for constant money supply / interest rate)

Problem: during crisis, selling domestic assets may not be so easy.
International reserves are largely *precautionary*: held against a time of need.

Historical Demand for Reserves

1960s theory emphasized the variability of *trade* flows as the source of the demand for reserves.
If a country would face large adjustment costs in the face of a sudden CA deficit, it could use its reserves instead of raising interest rates.
This argument suggests the adoption of flexible rates should cut into the demand for reserves. But it did not.

Currency Composition of International Reserves



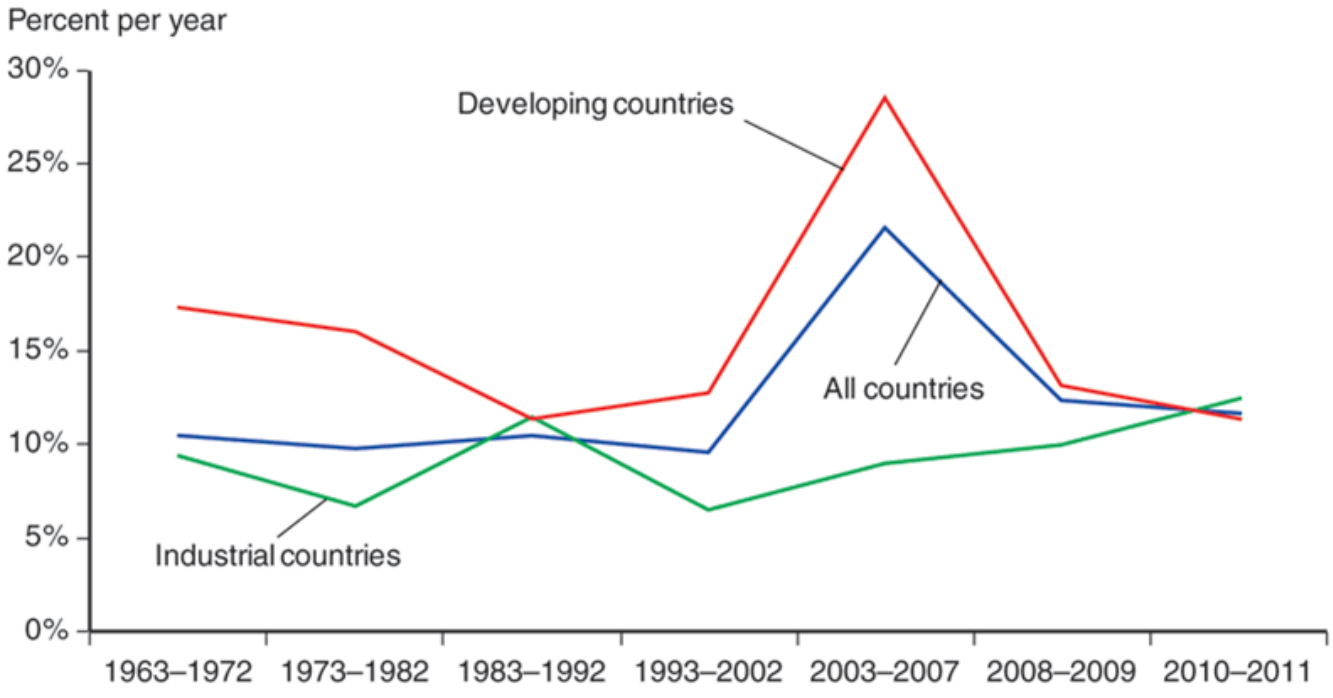
Source: International Monetary Fund, Currency Composition of Foreign Exchange Reserves, at http://www.imf.org/external/np/sta/cofer/eng/index.htm. These data cover only the countries that report reserve composition to the IMF, the major omission being China.

Note: Omits China.

Source: KOM 10 Figure 18-9

Data Source: http://www.imf.org/external/np/sta/cofer/eng/index.htm

Growth Rates of International Reserves



Source: International Monetary Fund.

Source: KOM 10 Figure 18-8 (Data Source: Economic Report of the President)

Appendix

Types of Fixed Exchange Rate Systems

1. Reserve currency system: one currency acts as official international reserves.
   - The U.S. dollar was the currency that acted as official international reserves from under the fixed exchange rate system from 1944 - 1973.
   - All countries except the U.S. held U.S. dollars as the means to make official international payments.
2. Gold standard: gold acts as official international reserves that all countries use to make official international payments.

Reserve Currency System

1944 - 1973 central banks throughout the world fixed the value of their currencies relative to the US dollar by buying or selling domestic assets in exchange for dollar denominated assets.

- Arbitrage ensured that exchange rates between any two currencies remained fixed.
  - Suppose Bank of Japan fixed the exchange rate at USD-JPY360 and the Bank of France fixed the exchange rate at USD-FRF 5.
  - Then the yen/franc rate was (360¥/US$1)/(5Ffr/US$1) = FRF-JPY 72
  - If not, then currency traders could make an easy profit by buying currency where it was cheap and selling it where it was expensive.

Reserve Currency System (cont.)

- Because most countries maintained fixed exchange rates by trading dollar denominated (foreign) assets, they had ineffective monetary policies.
- The Federal Reserve, however, did not have to intervene in foreign exchange markets, so it could conduct monetary policy to influence aggregate demand, output and employment.
  - The U.S. was in a special position because it was able to use monetary policy as it wished.

Reserve Currency System (cont.)

In fact, the monetary policy of the U.S. influenced the economies of other countries.

Suppose that the U.S. increased its money supply.

- This would lower U.S. interest rates, putting downward pressure on the value of the U.S. dollar.
- If other central banks maintained their fixed exchange rates, they would have needed to buy dollar denominated (foreign) assets, increasing their money supplies.
- In effect, the monetary policies of other countries had to follow that of the U.S., which was not always optimal for their levels of output and employment.

Gold Standard

Gold standard (1870 - 1914 and after 1918 for some countries): each central bank fixed the value of its currency relative to a quantity of gold (in ounces or grams) by trading domestic assets in exchange for gold.

- For example, if the price of gold was fixed at USD 35 per ounce by the Federal Reserve while the price of gold was fixed at GBP 14.58 per ounce by the Bank of England, then the GBP-USD exchange rate must have been fixed at $2.40 per pound.

Gold Standard (cont.)

The gold standard did not give the monetary policy of the U.S. or any other country a privileged role.

- If one country lost official international reserves (gold) so that its money supply decreased, then another country gained them so that its money supply increased.
- The gold standard also acted as an automatic restraint on increasing money supplies too quickly, preventing inflationary monetary policies.

Gold Standard (cont.)

- But restraints on monetary policy restrained central banks from increasing the money supply to increase aggregate demand, output and employment.
- And the price of gold relative to other goods and services varied, depending on the supply and demand for gold.
  - A new supply of gold made gold abundant (cheap), and prices of other goods and services rose because the currency price of gold was fixed.
  - Strong demand for gold jewelry made gold scarce (expensive), and prices of other goods and services fell because the currency price of gold was fixed.

Gold Standard (cont.)

- A reinstated gold standard would require new discoveries of gold to increase the money supply as economies and populations grow.
- A reinstated gold standard could give Russia, South Africa, the U.S. or other gold producers inordinate influence on international financial and macroeconomic conditions.

Gold Exchange Standard

The gold exchange standard: a system of official international reserves in both a group of currencies (with fixed prices of gold) and gold itself.

- allows more flexibility in the growth of international reserves, depending on macroeconomic conditions, because the amount of currencies held as reserves could change.
- does not constrain economies as much to the supply and demand for gold
- The fixed exchange rate system from 1944 - 1973 used gold, and so operated more like a gold exchange standard than a currency reserve system.

Gold and Silver Standard

Bimetallic standard: the value of currency is based on both silver and gold.

The U.S. used a bimetallic standard from 1837 - 1861.

- Banks coined specified amounts of gold or silver into the national currency unit.
  - 371.25 grains of silver or 23.22 grains of gold could be turned into a silver or a gold dollar.
  - So gold was worth 371.25/23.22 = 16 times as much as silver.

See http://www.micheloud.com/fxm/MH/index.htm for a fun description of the bimetallic standard, the gold standard after 1873 and the Wizard of Oz!

CURRENCY CRISIS EXAMPLE: Brazil 1997-1999

Background

- 1980s: high inflation
- 1994: introduce the *real*, peg to dollar, but: inflation 2669% in 1994

soon switch to crawling peg, but crawl too slow, $\rightarrow$ large real appreciation

1997:

- inflation 10%
- high deficit
- high interest rate

1999:

- *real* floats, loses about 50% of value
- export competitiveness recovers
- international reserves increase

Chiang Mai Initiative: Precursor

1977: ASEAN Swap Arrangement (ASA):

- bilateral reciprocal currency or swap arrangements (initial maximum total amount of $100 million; increased to $200 million in 1978).

ASEAN:

- 1965: Thailand, Singapore, Philippines, Malaysia, Indonesia
- 1984: Brunei
- 1995: Vietnam
- 1997: Laos and Myanmar
- 1999: Cambodia

Chiang Mai Initiative (CMI)

May 2000

- follows the 1997-1998 Asian financial crisis
- ASEAN+3 countries met in Chiang Mai, Thailand.

PLUS 3: China, Japan, and South Korea

Initiative: establish a regional liquidity support facility: a network of financing for countries with balance of payments deficits.

Other explorations coordinating monetary policies to fix their currencies, or even to create a common currency, in the future.

Chiang Mai Initiative (cont.)

ASEAN +3 countries wanted to preclude another Asian Financial Crisis (AFC) like the one that occurred in 1997.
This was also a response to the misdiagnosis of the crisis and the resulting inadequate response of the IMF.

- Banks did not insure (hedge) against a decline in the value of domestic assets, and when value of those assets dropped below the value of foreign currency liabilities after devaluations occurred, many went bankrupt.
- Banks expected that that the exchange rate would be fixed, but since 1997 banks have insured against this exchange rate risk.
- Thus, one of the reasons for having a fixed exchange rate (to avoid a banking crisis) has been already reduced by banks.

Chiang Mai Initiative Multilateralized

2008 Lehman shock CMI members requiring liquidity did not seek to use the CMI. Korea and Singapore borrowed from the US Federal Reserve; Indonesia secured finance from a consortium led by the World Bank.

2009-2010 CMI "multilateralized" (CMIM) a self-managed reserve pooling arrangement, governed by a single contract. ASEAN countries would contribute 20%, while the "plus three" countries contributed 80%

- 16% by Korea and 32% each by Japan and China (including Hong Kong).

The CMIM came into effect on 24 March 2010 with $120 billion. In 2012, the CMIM was doubled in size to $240 billion.
BUT:

- the contributions remain in the contributors central banks
- relative to crisis needs, the amounts are still small
- still very little use of the CMIM