

# Topic 14: international monetary systems (fixed vs flexible exchange rates)

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# Introduction

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The prior notes set the stage for this (brief) discussion by noting that Barbados has a fixed exchange rate relative to US \$. Many others (e.g., US, UK, Japan) have a fully flexible system. Why are there these differences? And consider the euro, which itself is flexible but keeps a rigidly fixed rate across countries that use it.

These insights tell us that *exchange-rate policy is a very important part of monetary policy*.

Start with an overview of what countries are doing in the world. See IMF Exchange Arrangements 2016 table on “monetary policy framework” by country.

Note the first three rows basically demonstrate that if a country has a rigidly fixed exchanger rate it does not have any other monetary policy targets.

As countries choose more managed exchange rates (next 5 rows) they do gain some ability to target either the money supply or inflation as the object of monetary policy.

Countries with fully flexible rates (“floating” and “free floating”) get to choose an independent monetary policy.

**Monetary Policy Framework**

Exchange rate arrangement (number of countries)	Exchange rate anchor				Monetary aggregate target (24)	Inflation-targeting framework (38)	Other <sup>1</sup> (48)
	U.S. dollar (39)	Euro (25)	Composite (9)	Other (9)			
<b>No separate legal tender (14)</b>	Ecuador El Salvador Marshall Islands Micronesia	Palau Panama Timor-Leste Zimbabwe	Kosovo Montenegro	San Marino			
<b>Currency board (11)</b>	Djibouti Hong Kong SAR  ECCU Antigua and Barbuda Dominica Grenada	St. Kitts and Nevis St. Lucia St. Vincent and the Grenadines	Bosnia and Herzegovina Bulgaria				
<b>Conventional peg (44)</b>	Aruba The Bahamas Bahrain Barbados Belize Curaçao and Sint Maarten Eritrea	Iraq Jordan Oman Qatar Saudi Arabia Turkmenistan United Arab Emirates Venezuela	Cabo Verde Comoros Denmark <sup>3</sup> São Tomé and Príncipe  WAEMU Benin Burkina Faso Côte d'Ivoire Guinea Bissau Mali Niger Senegal Togo	CEMAC Cameroon Central African Rep. Chad Rep. of Congo Equatorial Guinea Gabon	Fiji Kuwait Morocco <sup>4</sup> Libya (01/15)	Bhutan Lesotho Namibia Nepal Swaziland	Solomon Islands <sup>5</sup> Samoa



**Monetary Policy Framework**

Exchange rate arrangement (number of countries)	Exchange rate anchor				Monetary aggregate target (24)	Inflation-targeting framework (38)	Other <sup>1</sup> (48)
	U.S. dollar (39)	Euro (25)	Composite (9)	Other (9)			
<b>Other managed arrangement (20)</b>	Cambodia (03/15) Liberia		Syria		Algeria Belarus (01/15) China* (12/14) The Gambia (05/15) Guinea (02/15) Myanmar Rwanda (03/15) Tajikistan (03/15)		Angola (06/15) Azerbaijan (12/15) Egypt (01/15) Haiti (06/15) Kyrgyz Rep. (12/15) Malaysia Pakistan South Sudan (12/15) Vanuatu
<b>Floating (40)</b>					Afghanistan Madagascar Malawi Mozambique Seychelles Sierra Leone Tanzania	Albania Armenia* (11/14) Brazil Colombia Georgia Ghana Guatemala Hungary Iceland India Indonesia Israel Kazakhstan (12/15) Korea Moldova New Zealand Paraguay Peru Philippines Romania Serbia South Africa Thailand Turkey Uganda Uruguay*	Argentina* (12/15) Kenya* Mauritius Mongolia* Switzerland (01/15) Ukraine Zambia

**Free floating  
(31)**

Australia	Somalia <sup>11</sup>
Canada	United States
Chile	EMU
Japan	Austria
Mexico <sup>10</sup>	Belgium
(11/15)	Cyprus
Norway	Estonia
Poland	Finland
Russia	France
(07/15)	Germany
Sweden	Greece
United Kingdom	Ireland
	Italy
	Latvia

**Monetary Policy Framework**

**Exchange rate  
arrangement  
(number of  
countries)**

**Exchange rate anchor**

**U.S. dollar  
(39)**

**Euro  
(25)**

**Composite  
(9)**

**Other  
(9)**

**Monetary  
aggregate  
target  
(24)**

**Inflation-  
targeting  
framework  
(38)**

**Other<sup>1</sup>  
(48)**

Lithuania (01/15)
Luxembourg
Malta
Netherlands
Portugal
Slovak Rep.
Slovenia
Spain

# Introduction

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Can we notice any empirical regularities here? Characteristics of countries that choose fixed versus flexible?

Fixed-rate countries tend to be:

- Small and poor;
- Oil exporters;
- Have trade (and investment) volumes dominated by the country against which they peg.

Flexible-rate countries tend to be:

- Larger and highly developed;
- Linked together in a monetary system (e.g., EU);
- Large, upper-middle income economies (Mexico, Chile, Russia).

Other countries align somewhere between these extremes.

Why do these differences exist? Before discussing that let's do a little history on major international monetary systems.

# The Gold Standard (historical fixed exchange rates)

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*The Gold Standard (pre-WW I).*

You may know that many conservative policymakers and economists argue often for a return to the gold standard (GS) or to some other kind of “hard-money” standard where the value of currencies is fixed in terms of gold or some other valuable metal.

The gold standard was a system in which each participating country fixed its currency value to a particular quantity (1 ounce) of gold.

Great Britain did this early in the 19th century and because it was the world’s dominant trading country for several more decades, other countries eventually joined in.

The US had a “bimetallic” standard in which gold and silver coins were the currency (1 ounce gold = 15 ounces silver) and private banks could issue certificates that could be traded for them.

US adopted solely a gold standard in 1879 (1 ounce of gold = \$20.67) after inflation from the Civil War.

This choice destroyed the demand for silver as a circulating coinage material and many silver towns went bust. It also reduced the supply of money in the US and generated pressure for prices to fall, causing real distress in agriculture.

William Jennings Bryan’s famous “Cross of Gold” speech in 1896 when he advocated putting silver back into circulation at a ratio of 16 to 1 (16 silver ounces for 1 gold ounce). That would have dramatically increased the money supply.



# The Gold Standard

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If the major countries had these prices for currency in terms of gold units they were explicitly choosing fixed exchange rates. How did the GS work?

Finance ministries, e.g. the US Treasury) declared a fixed price (called “par value” or “parity”) in currency units for an ounce of gold.

Actual parities: UK set 1£ sterling = 113 grains of pure gold (works out to £4.25 per ounce); US set 1\$ = 23.22grains (\$20.67 per ounce)

=> E rate was  $113/23.22 = \$20.67/£4.25 = 4.86 \text{ \$/£}$ .

Finance ministries promised to buy or sell gold at that fixed price in any quantity. So the country’s currency value was backed strictly by gold. The higher the gold stock (at the Treasury) the greater the ability to increase the money supply. Gold reserves were the “monetary base”.

*But the idea here was NOT that the Treasury (or later the Fed, as 1913) would try to influence the money supply as a matter of policy. Rather it passively bought and sold gold as private transactions needed it, meaning that the actual supply of money depended on how much money people needed in circulation.*

This gold price was fixed and not permitted to change. Since there was no expectation of any change there was no need for any forward markets and only rarely any speculation against currencies.

# Gold Standard: practical operation

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To use the text's example suppose the UK set a price of £10 per ounce and US a price of \$40 per ounce. Then \$4 = £1 was the fixed exchange rate, or bilateral parity. How was it maintained?

Because anyone could buy or sell gold at any participating central bank, the exchange rate in any one country could never get outside a band around the parity given by the costs of shipping gold back and forth. See the text for UK-US example.

Here's another: the US and Japan. Suppose US set \$40 = 1 ounce; Japan set ¥80 = 1 ounce. So immediately we know that 1¥ = \$0.50 (\$1 = 2¥) in the FX markets. (And we know  $1¥ = (0.50\$/¥)/(4\$/£) = £0.125$ .)

(Note: actual rate in 1910 was 2.07 ¥/\$. Why do suppose it's now around 120 ¥/\$?)

If you wanted to convert an ounce of gold to yen in Tokyo you had to (1) buy 1 ounce with \$40 and (2) ship the ounce to the Bank of Japan. Let's suppose that it cost \$2.00 per ounce to ship gold between US and Japan (5% of the gold price; in yen terms it would be ¥4 per ounce). So the full cost for someone in the US to convert an ounce of gold for ¥80 at the Bank of Japan was \$42. Implicitly the \$42 was worth ¥80, or  $\$0.525 = ¥1$ .

The full cost for someone in Japan to convert an ounce of gold at US Fed for \$40 was ¥84, or  $\$0.475 = ¥1$ .

So these shipping costs set up a 5% band above and below the parity within which it did not pay to ship gold back and forth.

# Gold export and import points

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In this example the “parity value” is \$0.50 per yen.

But if the cost of shipping gold is \$2 per ounce that sets a 5% band above and below parity (0.475 to 0.525) within which it would not be profitable to ship and convert gold. If the private market FX equilibrium exchange rate is inside that band, the US Treasury and B of Japan don't do anything; no gold would be offered to or demanded from them.

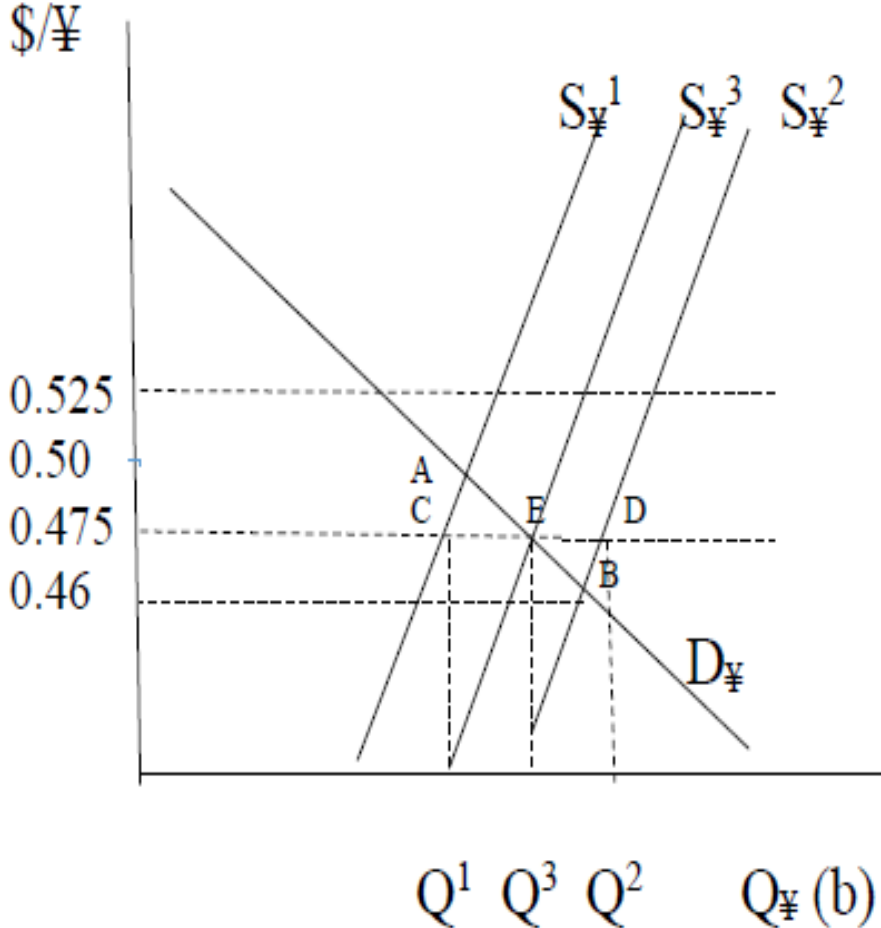
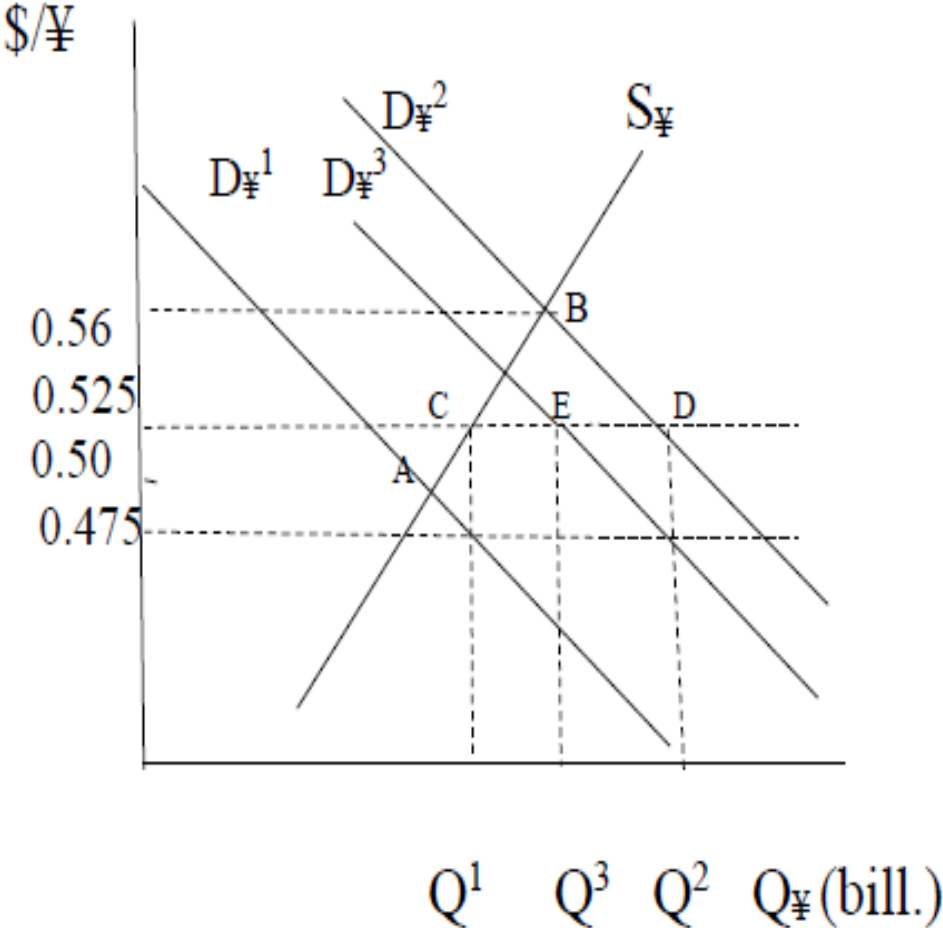
But suppose  $E = 0.54$ . A trader could take \$1 million to US Treasury, buy  $\$1\text{m}/40 = 25,000$  ounces of gold, ship to Japan at a cost of \$50,000 (total cost \$1,050,000) and sell them to B of Japan for  $25,000 * 80$  (yen/ounce) = ¥2 million. At the market rate this would be worth  $\text{¥}2 \text{ m} * 0.54 = \$1,080,000$ . Profit of \$30,000 per \$1 million traded.

So any  $E$  above 0.525 would cause gold to flow from US to Japan (US “gold export point” and Japan “gold import point”).

Similarly, any  $E$  below 0.475 would cause gold to flow from Japan to US (US “gold import point” and Japan “gold export point”). You should show this.

The next chart relates this theory to BOP surpluses and deficits.

Let's see how this system then worked. Below are 2 FX diagrams showing the market for yen in terms of dollars.



# BOP and monetary adjustment under GS

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Let these diagrams be in billions of yen.

In the left diagram, if S and D intersected at point A the parity value 0.50 would be the market price of the yen. We know that this exchange rate can fluctuate between 0.475 and 0.525 without any gold flowing.

Suppose S and D for yen intersected at point B. If the exchange rate were flexible the yen price would rise to 0.56.

But the exchange rate cannot rise above 0.525. Note that at 0.525 there is an excess demand for yen of distance  $CD = Q^1Q^2$  billion yen. This implies that Japan has an economic BOP surplus of CD billion yen. (And the US has a BOP deficit of  $0.525 * CD$  billion dollars.) There would still be upward pressure on the yen due to this excess demand.

But if the exchange rate went above 0.525 (say, at 0.53) we know that traders would buy gold (using \$) in the US Treasury, ship it to the Bank of Japan to get yen at the parity price, making a profit. (It's cheaper to get yen through shipping gold than in the FX market.)

*Key result: under the GS, if a country has a BOP surplus gold will flow into its monetary authority. If a country has a BOP deficit gold will flow out of its monetary authority.*

Convince yourself in the right diagram that at exchange rate 0.475 the US has a BOP surplus and Japan has a BOP deficit (of CD b yen). At any exchange rate below 0.475 gold would flow from Japan to the United States because getting \$ through the gold channel is cheaper than getting them in the FX market.

# BOP and monetary adjustment under GS

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Consider the first case (left diagram), say at an exchange rate of 0.53 \$/¥. What would happen?

Alternative 1: If the BOP surplus remains, Japan would see its stock of gold rise and US would see its stock of gold fall. This can only continue until the US risks running out of gold.

Alternative 2: As the gold stock rises in Japan then its money supply also rises. This should be inflationary and raise Japanese prices, wages, and maybe employment and output. Japanese goods would get more expensive, reducing the demand for yen. This is how the GS was designed to work.

As the gold stock (monetary base) falls in the US its money supply falls. This should be deflationary and reduce US prices, wages and employment and output. This would also reduce the demand for yen. So overall the demand for yen shifts inward to  $D_{¥}^3$  where the FX market is in balance at the gold export point. (The sustainable BOP surplus for Japan is CE billion yen). (Note: the supply of yen would also increase (shift to the right) because the Japanese would want to buy cheap US goods and assets. But we won't clutter the diagram that way.)

In the second case (right diagram) the adjustment is shown as a decrease in the supply of yen because as gold flows to the US from Japan, US prices rise and Japanese prices fall. The sustainable BOP deficit for Japan is CE b yen (and sustainable BOP surplus for US is  $0.475 * CE$  b dollars).

# BOP and monetary adjustment under GS

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*The conclusion is that the gold standard offers an automatic means of correcting BOP surpluses and deficits.*

*Any BOP surplus larger than the one at the gold import point will bring gold into the economy, raising its money supply and prices until the BOP returns to equilibrium.*

*Any BOP deficit larger than the one at the gold export point will take gold out of the economy, reducing its money supply and prices until the BOP returns to equilibrium.*

## BIG IMPLICATIONS:

1. Under the GS, countries with BOP surpluses will see their money supplies rise, which is inflationary. This should make them less competitive and correct the imbalance. Countries with BOP deficits will see their money supplies fall, which is deflationary. This should make them more competitive and correct the imbalance. This **“specie flow mechanism”** is what corrected imbalances in the BOP.
2. The central banks do nothing here other than just buy and sell gold. There is NO INDEPENDENT MONETARY POLICY; the money supplies of countries depend solely on private demands for gold, relative to the existing stock of gold.
3. If there is no monetary policy, the adjustments to BOP were in terms of INTERNAL ECONOMIC ADJUSTMENTS. Countries with BOP surpluses would see prices rise and there would be more demand for labor, driving up wages (and other costs). Countries with BOP deficits would see deflation and less demand for labor (lower wages and more unemployment).

# More comments on GS

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It's now possible to see why some conservatives prefer a gold standard to modern systems of flexible exchange rates (see below). The benefits they see:

- Fixed exchange rates should reduce international exchange rate risk from prices changing due to movements in exchange rates. This should increase international trade and investment.
- The GS rigidly constrains policymakers and so you could not see central banks raising or cutting the money supply on their own as a matter of policy. This discipline (gold as an “anchor”) was thought to be beneficial.

What problems are there with the GS? Several but here are 2 main ones:

- Each country's money supply depends on its stock of gold. So if there was an exogenous rise in the stock of gold there would be a rise in money supply. This would probably generate a BOP deficit and some of this money would go abroad. So global money supplies were dependent on where new gold finds existed.
- Many countries don't like the fact that the domestic economy must contract if they have a BOP deficit.
  - This deflationary pressure often causes real problems for uncompetitive countries. The best current example is Greece under the euro system. It's not a GS but a common currency, implying effectively a rigid exchange rate for each member country.

In fact, the GS collapsed mainly because certain countries wanted to inflate rapidly (e.g., Germany in the 1930s).



# Brief overview of gold-exchange (dollar standard) system

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*Bretton Woods system and the gold-exchange standard (or dollar standard)*

Brief comments on the Bretton Woods conference (1944) and what it developed: the IMF, World Bank, and the beginnings of the GATT (now WTO).

The primary outcome was to establish a new system of fixed exchange rates: the gold-exchange standard (GES). Here's how that worked.

The US (by then the major economic power) had the primary responsibility. It set the gold price at \$35 per ounce and the Fed pledged to buy and sell gold at this price to anyone.

All other IMF member countries chose an exchange rate fixed to the US\$ and had to buy and sell their currencies at this rate (within 1% bands) for dollars at the given rate but not gold. For example, the Japanese yen was set at 360 Y/\$ (= 0.0028 \$/Y) by the US authorities. Note how cheap the yen was in this system. It remained at that price until 1971.

The fixed exchange rate of each currency to the dollar was supposed to have similar effects as the GS on domestic economies and adjustments to BOP surpluses and deficits.

But countries could also borrow from the IMF to deal with temporary deficit problems. So the IMF became something new: a global issuer of money to central banks that needed it. IMF can issue "special drawing rights" (SDRs), which are part of the FX reserves of central banks that take some of them.

# Gold-exchange standard

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Countries with chronic BOP deficits were permitted to *devalue* their currencies on occasion relative to the dollar, as the UK did with the pound in 1967.

Countries with chronic BOP surpluses were permitted to *revalue* their currencies, as Germany did with the deutschemark (DM) a few times. Interestingly, Japan did not revalue even though it became highly competitive in the 1970s and 1980s. Its cheap currency was a big reason for Japanese export growth and became a real irritant with US policymakers.

Some key points to remember here:

*This entire system was built on the ability of the US to sustain its gold price in dollars, which meant it was based on confidence that the US dollar would not depreciate over time.*

*It was also built on the willingness of the US to expand its money supply to facilitate the needs of central banks around the world in buying and selling dollars. That is, the US had to stand ready to supply dollars as international reserves for other countries.*

*That meant in turn that if the US tended toward chronic BOP deficits (so US households, investors and the government bought more foreign goods, services and assets than foreigners bought from the US), foreign traders would take all of those excess dollars and convert them to local currencies at their CBs.*

*In turn, these foreign CBs would show up at the Fed to convert their excess dollars into gold and the US gold stock would diminish. This threat of the US losing its gold reserves was the disciplinary anchor of the system and limited US monetary independence.*

# Gold-exchange standard

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Why did this system collapse?

- In the 1960s the US government felt compelled to run a highly inflationary domestic policy to finance the war in Vietnam and pay for increases in social benefits (the “War on Poverty”).
- Also the US tended toward large deficits in the current account as imports exceeded exports. (Why? US households had low savings rates.)

This situation created large US BOP deficits and massive volumes of dollars flowed overseas in FX markets as a result. Foreign firms took them to their CBs to convert to local currencies with these impacts:

- Local CBs saw large increases in FX reserves.
- These conversions were greatly increasing local money supplies, so we saw a rise toward global inflation. In essence, the United States was “exporting” its inflation through the monetary system.

By 1969 a number of CBs saw this system as unsustainable and began to demand gold from the Fed as they brought dollars back to the US. This meant the US gold stock declined rapidly and the US government decided this was unsustainable.

In 1971 the dollar was devalued to \$38 per ounce and then \$42.20 in 1972 (this is still the US official gold price, though that doesn’t really mean anything).

None of this restored balance to the international system and in 1973 the US suspended its commitment to buy and sell gold, meaning that it went to a floating exchange rate. Other developed countries followed, though many developing countries keep a fixed rate. (But it is their responsibility to fix it, not the responsibility of the US).

# Comments on flexible exchange rates

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This has been the international system among developed economies since 1973 and shows no signs of changing. Why would major countries want flexible rates?

- Because it permits them to have an independent monetary and macroeconomic policy. That is, if a country wants to stimulate its economy with expansive money growth and budget deficits it can do that as long as it knows that will depreciate its currency.
- As a result, the country doesn't expose its domestic labor and output markets to the pressures of a fixed rate.

The major exception is the euro system, which is a combination of a single currency (and so rigidly fixed exchange rates of 1.0) among members but fully flexible against other currencies. I will circulate a set of notes on the euro system and the euro crisis.

All of which means we should understand why countries choose different systems. With all this background let's consider the advantages and disadvantages of fixed and flexible rates.

# Fixed versus flexible exchange rates

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*The case for fixed exchange rates (and against flexible rates)*

1. If your trade is heavily concentrated in a particular foreign currency it may be wise to fix the rate and not face a lot of exchange rate risk (discussed earlier).
2. Fixed rates provide greater certainty about the costs of doing business across borders. This advantage is greatest for small, extremely open economies who are more interested in stable foreign prices than domestic prices.
3. Fixed rates also reduce the risk of international investment.
4. The biggest reason: fixed rates are a policy “anchor” and countries can’t really run an independent macroeconomic policy.

These reasons are generally why developing countries peg to the \$ or euro or other currency. It also is the main driver behind the establishment of the euro, to integrate the economies better and reduce currency volatility costs.

# Fixed versus flexible exchange rates

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*The case for flexible exchange rates (and against fixed rates)*

1. Flexible rates permit more independence in monetary and fiscal policy.
  - If you want to raise your interest rate in order to dampen the economy you can do that and permit the exchange rate to adjust. (Put another way, with a flexible exchange rate economies are put back into balance through *external adjustments in the exchange rate*. The country can have “external balance” achieved without much disrupting the “internal balance”.
  - The US Fed is currently raising interest rates, which is attracting inward capital flows, pushing up the dollar in value. It also expands the CA deficit.

But it should be noted that policy flexibility is not necessarily the best thing if your country is likely to run highly inflationary macro policies with expansive government spending.

2. Developed countries with sophisticated financial markets can hedge away exchange rate risk so the problems with variability and instability really don't matter as much.

# Fixed versus flexible exchange rates

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So how do we summarize?

Countries preferring flexible rates:

- Large
- Less dependent on trade and investment
- More diversified trade patterns
- Higher level of economic and financial development

Countries preferring fixed:

- Small
- Very dependent on trade and investment
- Undiversified trade
- Lower level of economic and financial development (can't hedge or arbitrage risk)