

Exchange Rate Regimes

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The term “exchange rate regimes” refers to the various arrangements governments around the world make about international transactions. We’ll see (i) how central banks intervene in currency markets to fix the price and (ii) how such fixed exchange rate systems sometimes blow up.

A catalog of foreign exchange arrangements

Governments follow a wide range of policies toward their currencies. One aspect of policy is whether people and businesses can freely exchange their local currency for another: whether the currency is *convertible*. The US dollar, for example, is convertible, but the renminbi has limited convertibility: you need approval from the Chinese central bank to buy or sell Chinese currency.

A related issue is *capital controls*: whether the government restricts movements of capital (funds) in and out of the country. In the US, capital is generally free to move in and out of the country, although there are restrictions on foreign ownership of companies in some industries (banks, media, airlines). In China, there are limits on foreign investments that vary (as in the US) by industry and type (direct investment is easier than buying securities). And there are restrictions that limit the amount of money Chinese citizens can take out of the country. These controls are typically enforced through convertibility: since you can’t convert renminbi to (say) dollars, you can’t take it out of the country.

There’s nothing unusual about this. Many countries limit convertibility and capital flows, particularly during times of stress. Malaysia imposed capital controls during the Asian crisis of 1997, and Argentina did the same in 2002.

Another aspect of foreign exchange policy is whether the price of the currency is set by the government, allowed to float freely, or something in between. If the price is determined in a free market, we say we have a *flexible* or *floating* exchange rate regime. If the government sets the price, we say it has a *fixed* or *pegged* exchange rate regime. A *managed float* is somewhere in between.

Fixed exchange rates

Many countries have fixed exchange rate regimes of one sort or other. Panama uses US dollars, so its currency is fixed by design. The countries of the Euro Zone also used a common currency. Many others have their own currencies, but intervene to fix the price. Probably the most studied example is the Chinese renminbi, which has been quasi-fixed for most the the past decade.

How does a central bank set the exchange rate if the currency is convertible? Can it simply announce a rate? Probably not. You can state a price, but you can't make people trade at it. You could claim, for example, that your apartment is worth \$10m, but if no one is willing to buy it for that price the statement is meaningless. For the same reason, a central bank must back up its claim to fix the exchange rate by buying and selling as much foreign currency as people want at the stated price.

Let's think through how this might work. Suppose the New York City government decided to fix the price of beer at \$2 a 6-pack (cheap even if you live outside NYC). It supports this price by buying or selling any amount at the quoted price. Can they keep the price this low? Our guess is that at this price, beermakers would not find it profitable to make any (at least not any that we'd be willing to call beer). People would then flood the government with requests for beer, which the government would not be able to meet. When the government reneged on its promise to buy or sell at \$2, the price would rise above \$2 to its market level, either officially or on the black market. Unless the government has enough beer to back up the price, the system will collapse. Alternatively, suppose the government set the price at \$20. Beermakers would flood the government with beer at this price, leaving the government with a huge surplus. This is roughly what Europeans do with agriculture, where artificially high prices have left the EU with "mountains of butter," "lakes of wine," and so on. The point is that the government can only fix a price if it is willing and able to buy and sell at that price — or outlaws market transactions altogether.

The same logic applies to currencies. If the People's Bank of China were to support an excessively high price for the renminbi, then they would be flooded with offers from traders selling renminbi for (say) dollars. Its balance sheet would look something like this:

Assets		Liabilities	
FX Reserves	20	Money	200
Bonds	180		

We made these numbers up, but they give us the right idea: the central bank has the usual liabilities, "money" and government bonds, and also holds some foreign currency reserves, which you might think of (for this example) as dollars. The PBOC

intervenes in the currency market by trading renminbi for dollars, and vice versa, depending on market conditions.

Suppose, for example, that Nike wanted to convert \$2m to renminbi for the purpose of building a new plant. It would do this through a Chinese bank. If the bank had no countervailing trades, it would go to the PBOC and exchange the \$2m for renminbi at the going rate — say 10 yuan per dollar, to make the arithmetic simple. The PBC's balance sheet would then show an increase of 20m yuan worth of foreign currency and a comparable increase in its monetary base:

Assets		Liabilities	
FX Reserves	40	Money	220
Bonds	180		

Note that the transaction doesn't make the PBOC any richer. Its net worth is unchanged, since it has exchanged assets with equal value.

The difference, then, between fixed and flexible exchange rate regimes is that the former obligates the central bank to buy and sell currencies at the stated price.

The trilemma

Currency policy is evidently a dimension of monetary policy, since it involves management by the central bank of its balance sheet. Is it another tool a central bank can use to manage the economy?

Both logic and experience tell us that the central bank's choices are limited. The sharpest example is the "trilemma." You can choose at most two of

- fixed exchange rate
- free international flow of capital
- independent monetary policy.

If you try for all three, something will give, probably the exchange rate.

The US lets the exchange rate float, which allows it to have an independent monetary policy and free movements of capital. China limits the international flow of capital, which allows it to have a fixed exchange rate and an independent monetary policy. The UK in 1992 tried for all three, and it blew up, driving them out of the precursor of the Euro Zone. And Mexico let its real exchange rate appreciate in 1994, only to see it depreciate sharply at the end of the year.

Exchange rate crises

As a matter of experience, fixed exchange rate systems often collapse — sometimes spectacularly — when the central bank runs out of reserves.

We can illustrate the mechanics with the central bank's balance sheet. Suppose it looks like the one above, with “fx reserves” of 40. And suppose, further, that investors would like to exchange 50 worth of pesos for the same value in dollars. Once the central bank runs out of dollars, it can no longer support the exchange rate, which becomes (more or less automatically) floating.

It's the same issue we illustrated earlier with beer: if people would prefer to buy foreign currency at the official exchange rate, and the currency is convertible, the central bank may find that its supply of reserves is not enough to meet the market demand. (The market for currencies is enormous, so you need a lot of reserves.) For that reason, currency traders often look closely at the central bank's foreign currency reserves to measure its ability to maintain a fixed rate.

There's a big picture question lurking behind the scenes here: whether fixed exchange rate regimes reduce volatility. With flexible rates, we tend to see a lot of short-run volatility, as we noted earlier. With fixed exchange rates, short-run volatility is low, but we occasionally have spikes in volatility when the system collapses. Neither seems completely appealing, but that's the choice we're given.

Strong fixes (optional)

The tendency for fixed exchange rates to blow up has led to two competing lines of thought. One is to let them float: let off the pressure, so to speak. The other is to reinforce the fixed exchange rate system: nail the lid down tighter. Nothing has proved foolproof to date, but you never know.

One way to reinforce a fixed exchange rate is with a currency board. The idea is to start off with a large reserve of foreign currency and limit issues of domestic currency to this amount. That way you can never run out of foreign currency when people trade in their local currency. Argentina set up a system like this in the 1990s, and established an exchange rate of one dollar per peso. It was dissolved ten years later.

A more extreme arrangement is a common currency. The Euro Zone is the most ambitious effort along these lines to date. We'll see how it fares.

Executive summary

1. “Convertibility” and “capital mobility” refer to policy over currency transactions and international capital flows.

2. Foreign currency reserves are an indicator of the government's ability to maintain a fixed exchange rate.
3. The trilemma says you can have at most two of the following three things: (i) fixed exchange rates, (ii) international capital mobility, and (iii) independent monetary policy.

Review questions

1. Foreign exchange market intervention. Use a hypothetical central bank balance sheet to show how purchases of foreign currency affect the bank's assets and liabilities. What does this purchase do to the supply of money (currency)?

Answer. When a central bank buys foreign currency, it receives it from private owners and gives them domestic currency in return. The latter is an increase in the domestic money supply. Suppose, for example, the central bank starts with the balance sheet

Assets		Liabilities	
FX Reserves	100	Money	200
Bonds	100		

The purchase of 25 worth of foreign currency changes the balance sheet to

Assets		Liabilities	
FX Reserves	125	Money	225
Bonds	100		

2. Sterilization. Suppose the central bank has increased the money supply by purchasing foreign currency, as described above. How might it offset this impact on the money supply (sterilize it, so to speak)?

Answer. It does an equal sale of bonds, accepting money in return. If it sells 25 worth of bonds, the balance sheet changes to

Assets		Liabilities	
FX Reserves	125	Money	200
Bonds	75		

The net result of the two trades is that it's liabilities are now more heavily weighted in foreign currency. If the foreign currency rises, it makes money; if it falls, it loses money. This posture is designed as protection against a sharp fall in local currency (or rise in foreign currency), and it does that.

If you're looking for more

The International Monetary Fund's *Annual Report on Exchange Arrangements* is the definitive guide to exchange rate arrangements: fixed, flexible, capital controls, and so on.