**Slide Show Notes**

**Currencies**

The previous module's detour into Financial Crises touched on financial dynamics and institutions that hopefully you will find relevant to this module's presentation on Currencies. Obviously, one of the cases in the Financial Crises module was itself a currency crisis, in the form of collapsing exchange rates for Southeast Asian currencies relative to other currencies.

The module on the Balance of Payments also discussed a cross-border issue associated with having different currencies in different regions — a BOP crisis.

Clearly, the existence of many currencies around the globe creates issues that sovereigns would need to cooperate in addressing, as we've already seen in the case of the creation of the IMF to coordinate responses to BOP crises.

This module looks at the institutional aspects of currencies globally, as well as at some of the options for reforming institutions.

* What about the IMF? With the end of its old role that it had with fixed parities in the 1950s and 1960s, has it found a role relative to the new exchange rate system?
* And what's up with the Europeans and their euro currency? Or, looked at the other way around, what is system of having separate national currencies all about?

This is a big topic. This slide shows an outline of how the presentation will proceed.

It starts with background: the world's currencies, exchange rates, exchange-rate policy, economists' theories on exchange rates (typified by the Krugman-Obstfeld-Melitz textbook), and the particular case of the currencies that the lower-income half of the world lives with (currencies that I refer to as "mini-currencies").

Then the presentation will turn to international cooperation on currencies.

First, we'll look at currencies worldwide.

To start with, there are many currencies. For a complete catalogue, go online and check out sites that provide a list all the entries under ISO 4127, which standardizes currency designations.

Most sovereigns like having their own currencies, to the point that even territories that have only limited autonomy have their own currencies.

On the other hand, some territories, including fully sovereign territories, don't have their own separate, independent currencies. France uses the euro (whose ISO 4127 designator is "EUR"), a multi-country currency. Senegal uses another multi-country currency, the West African Franc (XOF).

Some territories have currencies that officially are separate but really are only representations of a larger currency.

* In Gibraltar, a "British Overseas Territory," the official currency is the Gibraltar pound (GIP), but the British pound (GBP) and the GIP circulate in Gibraltar as equivalents.
* Panama's official currencies are both the USD and the PAB (the *balboa*), but there are no PAB notes, only coins. USD notes circulate from hand to hand alongside PAB coins.
* The official currency of the island state of Kiribati is the Australian dollar (AUD), but Kiribati minted local coins for a while after independence in 1979, including a one Kiribati dollar coin.
* Brunei Darussalam's "Brunei dollar" (BND) is a subsidiary currency of the Singapore dollar (SGD) via a "currency board" arrangement, and both currencies circulate in Brunei.

I'll use the IMF's Annual Report on Exchange Arrangements to help count the currencies.

The IMF reports on currencies of 193 territories: its 190 members plus three other territories.

* Hong Kong SAR (People’s Republic of China).
* Aruba (Kingdom of the Netherlands).
* Curaçao and Sint Maarten (two lands under the Kingdom of the Netherlands that share a single central bank and a single currency).

The report makes it clear which territories are sharing currencies.

* 14 in the IMF's report have no separate currency and are using a "foreign" currency. Starting from 193 territories, this leaves 179 with separate currencies.
* 11 have "currency board" systems based on foreign currencies rather than their own independent currencies. This leaves 168.
* 19 are in the European Monetary Union, using the euro (EUR). Counting 1 currency instead of 19, this reduces the total by 18, leaving 150.
* 8 use the West African franc (XOF). Counting 1 currency instead of 8, this leaves 143.
* 8 use the Central African franc (XAF). Counting 1 currency instead of 8, this leaves 136.
* 6 use the Eastern Caribbean dollar (XCD). Counting 1 currency instead of 6, this leaves 131.
* 2 use the Netherlands Antillean guilder (ANG). Counting 1 currency instead of 2, this leaves 130.

But the IMF's report leaves out at least three substantial territories that have independent currencies but that are not IMF members: North Korea, Cuba, and Taiwan.

So, a working total of the world's separate, independent currencies would be at least 133.

The main difference between currencies is how acceptable they are globally. There are a small number that are "global reserve currencies," which are acceptable as FX reserves around the world. Most of the other currencies aren't used outside their own territories. I'll refer to them as "mini-currencies."

Which are the global reserve currencies?

The IMF reports on "The Composition of Foreign Exchange Reserves" in the world's central banks. By this standard, you might say that there is only one global reserve currency (the USD), or two (USD and EUR), or four (add JPY and GBP), or seven (add CAD, CNY, and AUD). All but the USD and EUR are probably mainly regional, rather than global.

The BIS reports the volume of FX transactions, which are mainly private transactions between banks, and the leading currencies in those transactions are about the same as for official reserves, except that the CHF appears in the top eight. (Each transaction involves two currencies. For the percentages to add to 100%, divide them by half.)

A somewhat more politicized indicator is provided by the IMF's selection of currencies for the "Special Drawing Rights" basket in which IMF transactions are denominated. The result remains about the same, except the CNY ranks higher, and the basket only has five currencies.

So, no more than 8 currencies are used globally and the predominant currency type globally are the 120+ mini-currencies with limited use outside their home territories. The following slides provide snapshots of five mini-currencies.

Mozambique's "new metical" (MZN).

North Macedonia's "denar" (MKD).

Nicaragua's "córdoba oro" (NIO).

Czechia's "koruna" (CZK).

The Philippines' "peso" (PHP).

Suppose the world's central banks don't accept your currency as a global reserve currency. Do you have other options, aside from maintaining an independent mini-currency?

Yes: as noted above, a number of countries have adopted alternatives.

* Some have linked their currencies to a foreign reserve currency through a "currency board" system.
* Some have designated a currency from another country (usually a global reserve currency) as their legal tender.
* Some have gone together with their neighbors to unify their currencies into a regional currency.

A "currency board" only emits its currency, the "local currency," in exchange for the "base currency," which is a global reserve currency. So, the currency board always has OIR equal, at the legally fixed parity, to the amount of local currency that is in the hands of the commercial banks (bank reserves) and of the non-bank public (folding currency). Therefore the currency board can always redeem any local currency it has issued for the base currency, at par.

Indeed — and this is the key point — the policy of a currency board is always to redeem local currency by paying out the base currency at par whenever requested, no questions asked.

The effect of this system is that the fixed parity is not affected by market demand for the local currency, however much of the local currency the banks and the public want to redeem for the base currency. The currency board can never run short of FX because it never emits currency except in exchange for FX.

"Capital flight" (the exchange of local currency for the reserve currency) can take place, but there is no exchange-rate risk to flee from. Furthermore, when local currency is redeemed, local-currency credit may become tight, raising local-currency interest rates and encouraging retention of the local currency. This is a stabilizing force on demand for the local currency.

In principle, therefore, a currency-board system provides residents with both local currency notes for local use and trouble-free access to a global reserve currency for international use.

Originally associated with imperial systems (where dependent territories would base their currency boards on the imperial power's currency), the currency-board system has now become a policy choice.

The IMF's Annual Exchange Arrangements publication reports eleven territories as having currency boards, notably including Hong Kong. The Eastern Caribbean Currency Union is both a currency union and a currency board based on the USD.

Another alternative to having a mini-currency is to use a global reserve currency or the currency of a larger neighbor. Quite a few countries do this: this slide lists a few examples, along with the case of comparator countries who are similar but who have kept separate, independent mini-currencies.

Some of these countries have local notes or coins for use by hand in small consumer transactions, where they circulate alongside foreign notes and coins and can be redeemed for the foreign notes at any time. The difference between this system and a currency board is a matter of degree.

Using a global reserve currency from another country instead of creating a currency of your own is sometimes referred to as "dollarization," even if the global reserve currency isn't the USD. (As described below, "dollarization" is also used to refer to cases where there is a local currency that people usually use, but where banks also offer accounts in a global reserve currency and residents make heavy use of it in addition to the local currency.)

Countries' reasons for choosing or not choosing to use foreign currencies are as diverse as the countries' histories.

In addition to the option of using a global reserve currency, there is the option of creating a single currency for a group of countries, thus making the resulting currency bigger and more widely used than a currency of any of the individual members would be.

There are currently four main cases of multi-country currencies serving all the country-members in a currency union. They're listed on this slide.

Since currency union's currency doesn't belong to just one country, the ISO 4127 designator can't start with a an existing two-letter country designator. Instead, in some cases ISO replaces the country designator with 'X' and then adds two letters.

There are also cases of countries moving in the other direction — dissolving currency unions and currency boards, and adopting national mini-currencies in their place. The East African Currency Board formed in the early 1900s by Uganda, Kenya, Tanganyika, and Zanzibar was something like the East Caribbean Currency Union today, but its members severed their relations with the GBP and with each other's currencies after political independence.

Have you noticed sometimes that it's hard to get people to do what you want?

In the case of currencies too, people often use the currencies they want, despite what the government says. As has been noted, some governments explicitly endorse circulation of a foreign currency alongside the local currency.

Also, it's common to see two currencies in use in border areas.

But private choice of currencies goes far beyond this. Even in countries that actively discourage use of other currencies, the attractiveness of global reserve currencies means that businesses and citizens may use them extensively anyway. Experiences in countries with mini-currencies are likely to demonstrate this on a personal level. U.S. residents who don't travel likely have no experience of it.

At the business level, even when neither the importing or exporting country uses the USD officially, it's common for firms to demand payment for exports in USD or another global reserve currency to minimize the impact on their businesses of mini-currencies' frequent exchange-rate changes.

Also, both firms and wealthy individuals try to keep their assets in the relatively safe form of global reserve currencies.

This behavior by banks, firms, and households is an aspect of "dollarization."

Countries who have their own currencies must manage both their Balance of Payments (an increase or decrease in OIR) and their exchange rates.

A previous module covered the Balance of Payments. What about exchange rates?

An exchange rate is a price.

Prices are usually simple. If I ask you the price of something, say — a computer, the answer is that it's so-many USD. If the computer's price goes up, we say, "Its price went up." If the price of the pound goes up, we might say, "Its price went up."

But it doesn't make much sense to quote the price of a currency against itself: "What's the price of a dollar?" In USD, USD 1.00 is always USD 1.00.

Rather, the value of a currency must be quoted in another currency. If the price of a USD in terms of the euro (EUR) goes up from EUR 0.90 to EUR 0.95, we say that the USD has "appreciated" against the EUR. If the average of the USD's prices in terms of all the other currencies goes up, economists say that the USD's "effective" rate of exchange appreciated.

These are "indirect" quotes of the value of the USD. "Direct" quotes are the prices of foreign currencies. So, if here in the U.S. the price of the EUR rises from USD 1.10 to USD 1.11, we can say that the EUR appreciated against the USD or that the USD depreciated against the EUR.

Changes in officially set exchange rates are often referred to as devaluations and revaluations, in contrast to changes in market-set exchange rates, which are called depreciations and appreciations.

Even if the government doesn't legally set a particular exchange rate, a governmental policy to move a market-set exchange rate in one direction or the other (for example, by the central bank's buying or selling FX in the market with the intent of changing the market's equilibrium rate) might also be referred to as a devaluation or revaluation, because it's the result of an official policy.

The commercial banks who make payments for their customers in other currencies keep inventories of securities denominated in different currencies and must guard against loss of value in their assets due to exchange-rate changes. So, they are constantly trading financial instruments according to their expectations about future exchange-rate changes. (Hopefully, they can even make money with their trades.)

According to surveys by the BIS (reported in the BIS's "Triennial Central Bank Survey: Foreign exchange turnover in April 2019"), over half of currency trading is done by ten big banks located in London or New York City, with 88% of the trades being the USD against some other currency, and with the volume in recent times being on the order of USD 6 trillion per day. From this huge volume you can see why exchange rates are dominated by financial speculation rather than by the relatively small balances of goods & services trade, which are less than 10% of the overal FX market.

So, now we have some background regarding the world's currencies, the nature of exchange rates, and the risks of currency crises. Let's look into countries' arrangements to manage their currencies' exchange rates.

The IMF, in addition to helping members through BOP crises, was also built to coordinate exchange-rate adjustments.

But the system that the IMF was built to coordinate, the system of fixed exchange-rate "parities," broke down and ended in the early 1970s. Since that time, the world has not settled on a uniform exchange-rate policy.

So, the IMF is neutral about its members' exchange-rate policies and helps members manage whatever policy they adopt, so long as the policy permits international payments to go forward — especially for commerce in goods & services.

But as regards payments for purely financial transactions — buying and selling securities (rather than goods & services) — there remains debate about whether governments should limit them (using "capital controls") or not. It's sometimes argued that governments should limit short-term speculative financial flows in order to stabilize the exchange rate. On the other hand, the governments of the U.S. and the UK, as homes to financial industries that make money by currency trading, are more in favor of fluctuating exchange rates and speculation in currencies. As a result of this unresolved debate, the IMF doesn't take a definitive stance on capital controls.

As part of its role in knowledge management, the IMF catalogs and analyzes its members' currency and exchange-rate policies, which it refers to as "exchange rate arrangements" (ERAs). The IMF's "Annual Report on Exchange Arrangements and Exchange Restrictions" is a great source of information on the state of play around the world.

The Fund identifies ten different ERAs in the report's Table 1, "Classification of ERAs" (reproduced in this slide), with each ERA being explained in more detail in a later section of the report, the "Compilation Guide." Each IMF member country is asked to report to the Fund the ERA that it is implementing, and the Fund staff empirically verify that the member's policies and the resulting course of exchange rates correspond to the member's reporting.

Note that the IMF characterizes "no separate legal currency" as an "exchange-rate arrangement" even though there's no currency to have an exchange rate with.

The Fund's ERAs are mainly distinguished by how much control the government tries to exert over the exchange rate. A lot of control is a "peg," while relatively little effort at control is a "float."

No country that has its own currency is indifferent to its currency's exchange rate, however, even if it's "floating." Countries with mini-currencies are particularly aware of the potential for market exchange-rate changes to morph into exchange-rate crises.

This awareness creates a "fear of floating," since changes in an exchange rate that is floating might go beyond what the market expects and create expectations of further change. In particular, if a depreciation leads currency traders to suspect that further depreciation is coming, it will result in the traders selling — which generates the further depreciation they expected ("self-fulfilling" expectations). The further depreciation is purely the result of expectations rather than whatever the reason for the initial depreciation was.

Since policy makers don't know how expectations are formed, it's safest not to do anything to worry currency traders. Exchange-rate changes are therefore looked on with concern, even under a floating-rate policy, resulting in government interventions to limit exchange-rate changes, making the float not a pure, "clean" float but rather a "dirty" or "managed" float.

Similarly, a policy of pegging the exchange rate to a particular level might not be an absolute policy. There might be a range of exchange rates that are considered acceptably close to the rate you want to peg to. You might call the peg "soft."

Sometimes it's hard to tell a soft peg from a dirty float. In both cases, the government is intervening to keep the exchange rate from changing too much, too quickly. There is a colorful menagerie of terms for different policies, including bands, crawls, and snakes.

For an IMF member in a currency union, the IMF used to report that the member had a "hard peg" of its (nonexistent) exchange rate against the currency of the union. For example, when after 1999 France and Germany were using the euro, the IMF said that France's currency was in a hard peg with Germany's currency.

That seemed a little odd, so the Fund switched to reporting that the ERA of a currency-union member like France is determined by the policy governing the currency of the currency union, the European Monetary Union. Since the euro floats, the IMF now reports (in Table 4, "De Facto Classification of ERAs") that the EMU has a floating currency, that France has a floating currency, and that Germany has a floating currency.

The Fund still reports that members like Kosovo have a hard peg to the currency they use, the EUR in Kosovo's case, although what it is that Kosovo is pegging to the EUR is not clear.

It's as if in the IMF's mind each country must have a national currency of its own, and if it doesn't then there must be a ghost of its currency wandering the land, shackled (pegged) to the union's currency. I wonder if they can hear its chains rattling?

Seriously, there appears to be some "framing" going on here, as the IMF's way of expressing things seems rooted in the notion that individual national currencies are a natural phenomenon and that alternatives need to be described using terms that imply that.

This specter that haunts the IMF is not, however, the historical reality, as national currencies are an invention of the 1800s. Previously, currencies tended to be universally accepted commodities — gold being only the most famous example — or private bank money. The Bretton Woods system attempted to imitate this, so the triumph of currency nationalism can really only be dated from the early 1970s. In any case, the idea of separate, independent currency for each territory still is far from having total sway, given the variety of practices that the IMF persists in calling "exchange rate arrangements."

The IMF characterizes the way the country will try to realize its exchange-rate goals as the "Monetary Policy Framework." Each monetary policy framework is defined by a target variable.

The Fund's ERA report, in Table 4, shows countries' ERAs and Monetary Policy Frameworks together in matrix form. (The 2021 version of the table is shown in the [annex](#Table4) at the end of these notes.)

Each target is represented by a column, with the various possible targets being (i) the exchange rate with some other currency, (ii) the money supply, (iii) the inflation rate, and (iv) a flexible mix of targets. (The first several columns are for the various currencies whose exchange rate might be targeted.)

The table's rows show the institutional mechanisms — the ERAs — that the countries use in adjusting their policies to their targets.

Targeting the exchange rate as a Monetary Policy Framework obviously correlates with pegging as an ERA. Thus, there are many countries in Table 4 in the pegging rows at the top that are targeting an exchange rate. In contrast, no member with a floating ERA has a monetary policy in Table 4 that targets the exchange rate — that would be a contradiction in terms. Thus, the floating rows at the bottom are empty in the columns for targeting an exchange rate.

The money supply was for a few years considered a popular monetary-policy target, but it has fallen out of favor for several reasons.

* Financial assets that are used as money are diverse: you may have heard of different measures with names like M1, M2, M3, "Broad Money," and so forth.
* Money-like assets are also constantly changing and it's sometimes hard to keep up with the market. This lesson was reinforced when the world became more aware of "shadow banking" in the crisis of 2008.
* As a result of the diverse, changing nature of the money supply, no one was ever sure which financial assets should be targeted as "the money supply."
* Instead, to decide whether there is too much or too little money, central banks judge not by quantity but by price: the interest rate.
* So, central banks provide the reserves that financial markets want at the interest rate the central bank sets (rather than providing a predetermined amount of reserves regardless of impact on interest rates).
* Furthermore, the central bank has direct impact on commercial interest rates through the interest rate the central bank charges to lend reserves to the banks.
* In sum, central banks use the thing that they can measure and control (the interest rate), rather than something that they have trouble observing and can only influence indirectly (the money supply).

In terms of the IMF's Monetary Policy Frameworks, "inflation targeting" is now more popular than targeting the money supply. A central bank that is targeting a certain inflation rate would adjust its interest rate up to slow down spending if inflation were higher than the target rate.

If an IMF member doesn't use one specific target, the country falls in the final, "Other" column of Monetary Policy Frameworks. The rows in the Other column show how much attention different ERAs pay to the exchange rate. This ranges from the Solomon Islands, which pegs against a group of currencies, to Somalia, which not only doesn't care what its exchange rate is (it has a free-floating ERA), but "does not have a monetary policy framework" either. (The ISO code for Somalia's currency, by the way, is "SOS.")

Only two other entities are listed in Table 4 in the same category as Somalia: the U.S. and the European Monetary Union. What this signifies is not that the U.S. and the EMU don't care enough about what their exchange rate is to do anything particular about it. It's that they don't have to care. Their currencies are the preeminent global reserve currencies, so no one is going to abandon them. (As someone once said, "It's good to be King.")

To be more explicit about implementing monetary policy, this slide lists the instruments that central banks use to hit the monetary policy targets.

* Buy and sell FX.
* Buy and sell "domestic assets," usually government bonds. (Buying expands credit, lowers the interest rate, and indirectly expands demand for FX.)
* Set interest rates for loans to banks.
* Set rules regarding what banks can provide FX for: the rules are often called exchange controls, currency controls, or capital controls.

The IMF takes specific cognizance of these instruments, especially when a member is using Fund resources.

* The IMF's Articles of Agreement include clauses discouraging currency and capital controls.
* As we saw in the case of Pakistan, IMF loan agreements typically set ceilings for "Net Domestic Assets" and effectively limit sales of FX by setting floors for the central bank's FX reserves.

To make economic recommendations about what ERA to adopt, you need to have an economic theory about how ERAs connect with the economy.

Let's get guidance about economists' theories from a leading textbook written by some of the most authoritative professors of international economics — Profs. Krugman, Obstfeld, and Melitz (KOM).

There are three principal economic variables that determine exchange rates: interest rates, price levels, and expectations. Let's see what the textbook says about each of them.

An emphasis on interest rates highlights the fact that the FX market is dominated by speculative trading for financial gain (rather than merely to get access to FX to pay for imports).

The idea behind the interest-rate theory is that if you can get an interest rate 5 percentage points higher in London than in New York, you'll take it — that is, unless you believe that, at the end of the year when you cash in your certificate of deposit in London and bring your funds back to the U.S., the USD will have risen by 5% relative to the GBP. Paying the higher price for USD on bringing your funds back to the U.S. would cost you the whole interest-rate gain.

On the other hand, this numerical situation would represent an equilibrium relationship between four things:

* The two interest rates — today's one-year interest rates in (1) London and (2) New York.
* And the two exchange rates — the USD-GBP rate (3) today and (4) a year from today.

It's an equilibrium because, with those numbers, there would be no gain from shifting money between London and New York City and thus no tendency to shift funds: no movement = equilibrium.

Economists predict that economic variables will move to equilibrium values, so that's the theory: the higher the gap between London's interest rate and New York's, the more financial markets evidently expect the GBP to depreciate against the USD.

Of course, although the two interest rates are available in contracts that you can sign today, no one really knows what the change in the USD-GBP rate will be over the next 365 days. So, how do you decide if the higher interest rate in London is really a good deal?

Well, you could just speculate. You could say, "No, the market's overall expectations are wrong. The USD won't appreciate against the GBP by 5%. Maybe only 1% or 2%."

But then you would be anxiously watching the news over the whole year, looking at every bit of news about exchange rates. (Welcome to the world of people who live in countries with mini-currencies! Of course, most people in those countries don't have enough wealth to own investments in other currency areas. But the things they buy are largely imported or produced with imported inputs, so their purchasing power and standard of living are immediately affected by exchange rates.)

For money managers who do manage investments spread across several currency areas, however, news over the coming year that changes their individual expectations could lead them to cash in their London CDs early, if the news leads them to think that the GBP will depreciate by more than 5%. So, one consequence of a link between exchange rates and interest rates is that the supply of credit in London varies depending on expectations regarding exchange rates.

Another consequence is that cross-currency investments are risky. Fortunately, there are plenty of bankers out there willing to do the speculating for you. They are willing to sell you, right now, USD for delivery a year from now (a "forward" contract). And if the market consensus makes that forward contract anything less than a 5% depreciation of the GBP — say, for example, the forward contract for one year from now is at the same USD-GBP exchange rate as today's (0% depreciation) — then that 5 extra percentage points of interest in London is going to be all gravy, because you can guarantee today that there will be no price surprise on your funds' return trip. So, you're covered — it's called "covered interest arbitrage."

But then we're back to a situation where there's free money to be made. Massive funds would immediately want to sell their New York CDs, buy GBP, buy London CDs, and buy USD forward. But the theory is that, as a result of these transactions, exchange rates and interest rates would all change until they reached "covered interest parity": the interest-rate difference would be exactly covered by the difference between the spot and forward exchange rates, which is the equilibrium.

Again, economists' theory is that the expected exchange-rate change (the difference between the spot exchange rate and the forward exchange rate) must change to remain equal to the interest-rate difference.

Here's the equilibrium equation:

$$\left(1+iUSD\right)=(1+iGBP)(\frac{FutGBP}{NowGBP})$$

In other words (once again):

* If you deposit your dollar in New York City, you get at the end of the year your dollar back plus interest at the U.S. rate, *iUSD*. That's the left-hand side.
* If you deposit your dollar in London, after one year you get the dollar back plus interest at the UK rate, iGBP, plus however much the GBP has appreciated against the USD in the interim, the ratio of the future USD value of the GBP (*FutGBP*) and today's USD value of the GBP (*NowGBP*). That's the right-hand side.
* If those two returns are equal, no one has any incentive to move money between the two markets and there's equilibrium.

Today's exchange rate is *NowGBP* and there are three factors that determine it in equilibrium — the U.S. interest rate (*iUSD*), the UK interest rate (*iGBP*), and expectations about next year's exchange rate (*FutGBP*) — and there's an inverse (or, negative) relationship between U.S. interest rates and today's value of the GBP (its price in USD), which is in the denominator of the expression on the right. That means there's a positive relationship between U.S. interest rates and today's value of the USD (the USD's price in GBP). So, the U.S. central bank would appreciate the USD by raising U.S. interest rates.

But that relationship assumes that the other two variables don't change. In other words:

* The UK's central bank keeps UK interest rates unchanged when the U.S. central bank changes U.S. interest rates.
* Expectations of the future don't change when the interest rates and the exchange rate change.

Those assumptions seem unlikely.

Anyway, how does the interest-rate theory work out in practice?

If KOM were actually your textbook, it would be 6 chapters and 260 pages later before you found out that it doesn't work at all. Not only does the theory fail in its predictions, but it's common to be able to profit by investing according to the opposite of its predictions. This is what's called "the carry trade": borrowing in one currency area and lending in another currency area at higher interest rates, without exchange-rate changes eating up your gains. (Of course, there's a lot of risk in it.)

How about our second contestant for "theory of exchange rates": national price levels?

This one is easier to understand: if the price of apples and everything else in the U.S. goes up by 10% (expressed in USD), and if nothing else changes, including local prices of apples etc. in the UK, then the equilibrium price of the GBP (expressed in USD) goes up by 10% too. After all, if the USD-GBP exchange rate did not change, then everything in the UK would be 10% cheaper than everything in the U.S.: U.S. exports would collapse, imports from the UK would boom.

But then the demand for GBP to pay for those imports would boom, with USD being thrown on the market to get them. Before long, that 10% price disadvantage of U.S. goods would be erased by the GBP exchange rate rising by 10% against the USD, and the tendency to expand imports from the UK would cease.

Again, we have a process leading to an equilibrium and, according to economists' methods, a prediction: a country whose inflation is faster than another country's has a currency that is depreciating against the other country's. That the "Purchasing Power Parity" theory.

A mere 8 pages later in KOM's textbook, however, the student finds out that theory no. 2 also does very badly. Common personal observation also verifies that prices differ markedly in different countries, even when corrected for the exchange rate.

That's not too surprising when you consider that, when there is a bilateral surplus in the bilateral balance of trade, the volume of currency trading needed to compensate for the imbalance in goods & services commerce is only a small part of the amount of currency actually traded in FX markets. More than 90% of FX markets' activity is buying and selling financial instruments (not goods & services).

So, you can't expect the goods & services balance of trade to dominate the price that is set by the overall balance of payments (as the Purchasing Power Parity theory assumes).

How about expectations? Unfortunately, this is no help either.

Interest rates, inflation rates and exchange rates (including forward exchange rates) are observable. You can use them as data to infer what financial markets' expectations must be, in theory.

But, as KOM says (on page 658), the expectations themselves are unobservable. And, obviously, you can't predict exchange rates using non-existent data.

For government policy, not having data on expectations means that you can't calculate how policy has historically affected them, so if you're trying to set policy to affect exchange rates by affecting expectations, you're flying blind.

Returning to the earlier slide about interest rates as predictors of exchange rates, the discussion noted that the theory depended on expectations not changing. But if you don't know how expectations are formed, how can you assume that?

In sum, economists' theories don't seem to have provided dependable guides to how exchange rates will correspond to interest rates and inflation. So even if sovereigns were able to manage those two "fundamentals" they wouldn't know what market exchange rates would result.

Another way of saying this is to say that market exchange rates are "unstable." That doesn't mean that they necessarily change all the time. On the contrary, it means that market exchange rates may stay unchanged even when fundamentals say they should move. Then, they may change without apparent stimulus from the side of fundamentals.

An everyday experience that illustrates the concept of instability is hot and cold water in the shower. Sometimes you want the water coming from a tap to be a bit warmer, so you turn the handle and — nothing happens! You turn it a bit more, and still nothing. A little bit more, and suddenly the water is super-hot. That's instability: something whose changes are not proportional to an observable cause (or not predictable on the basis of observable causes).

One question is whether, even though macroeconomic policy can't predict or control market-determined exchange rates, maybe there is an unobservable mechanism by which the FX market will respond to shocks and crises in a way that will make adjustment those crises easier.

If that were true, however, then there would be an *ex post* correspondence between market exchange rates and the other macroeconomic variables that change in crises. As KOM reports, we don't see that correspondence.

To take the case of the 2009 financial crisis, the IMF's 2016 review, "Strengthening the International Monetary System — A Stocktaking" (in Canvas), found that exchange-rate changes had a "limited role" in adjustment, partly because their reaction to the crisis was inconsistent and also partly because the impact of whatever exchange-rate changes there were was small.

So, this presentation has now covered:

* The world's currencies.
* Exchange rates.
* Exchange-rate policy (as catalogued by the IMF).
* Economists' theories on exchange rates (represented by the KOM textbook).

Let's turn to the case of the mini-currencies, which in addition to being the majority of the currencies are also used by the majority of the world's people.

Residents of the U.S. — and textbooks written by and for people in the U.S. market — may not appreciate the importance that cross-border transactions and exchange rates have for people who live in small territories with mini-currencies.

The tradeoffs between risks and benefits of having "your own" currency look different from the perspective of a developing or emerging-market country with a mini-currency than they do from the perspective of an industrialized country with a global reserve currency.

The modules in this course on Financial Crises and Currencies include readings from the 2006 book, *Playing Monopoly With the Devil: Dollarization and Domestic Currencies in Developing Countries*, by the former Finance Minister of El Salvador, Mr. Manuel Hinds. The book is available electronically in the Indiana University library. Although like anything having to do with international finance it is hard to understand the arguments the first time you hear them, Hinds' book uses simple language and is worth reading.

One point that it makes repeatedly is that U.S. residents and developing-country residents have very different lived experiences as regards currencies. No one in the U.S. thinks about exchange rates, but everyone in a developing country with its own mini-currency is aware of what its U.S. dollar exchange rate is.

Managing a mini-currency that is separate and independent from the global reserve currencies has two aspects.

* You have to ensure that FX reserves are available to pay for imports from other currency areas.
* You have to prevent exchange-rate changes (probably depreciation) from getting out of hand.
* You can try to get some advantage from having an "independent monetary policy."

The first two issues — the risks of BOP crises and exchange-rate (currency) crises — have been described in previous modules.

What about the potential benefit of having an "independent monetary policy"?

Mainly, it is about the government wanting local industry to get credit at interest rates that are different (higher or lower) than the interest rates in financial markets outside the country.

Two questions about an independent monetary policy:

* Is it feasible? Can the central bank of a mini-currency actually keep interest rates higher or lower than prevailing rates in global markets?
* If you can do it, what are the results? Is it beneficial?

For example, suppose the government of a developing country wants interest rates for local industry to be lower than in world markets in order to finance investment at a lower cost and thus to accelerate industrialization.

The thing about having different prices for the same thing (your lower interest rates for loans, their higher rates) is that, since people and firms want to buy low and sell high, they will try to take advantage of the difference between your interest rates and global rates. This will start a series of events.

* Your banks will be able to lend a lot but won't be able to retain deposits. Everyone will want to draw down their local-currency deposits, buy FX, and deposit the FX in Miami or London to get the higher interest rates there.
* This is going to exhaust local banks' FX inventories and require the central bank to provide FX to the interbank market — until, of course, the central bank itself runs out.
* Obviously, the quantity adjustment will stop when the central bank's OIR reaches zero, so somewhere along the line a price adjustment will start, meaning that sellers of FX will start asking higher prices for the increasingly scarce FX. In other words, the local currency will depreciate. (This depreciation might start as soon as the market sees the interest rate fall below global levels, because in developing countries with mini-currencies the market has seen this all happen before.)
* Currency depreciation raises import costs for industry and consumer prices — in other words, inflation.
* Unfortunately, the prospect of depreciation creates another buy-low, sell-high opportunity, as local depositors will foresee that they can shift to FX deposits in Zurich now and buy the local currency back cheaper a year from now. So now there are two reasons to shift from local currency to FX — (1) interest-rate differences and (2) the prospect of depreciation — which further accelerates both depreciation and local price inflation.

This doesn't sound like a very good dynamic, does it? Any benefit local industry gets from low-interest loans seems like it would be offset by import costs and general inflation, which will affect wage costs. Also, banks' private deposits are dwindling, so that the banks are increasingly dependent on central bank lending, which is a way of saying that they're in crisis.

Manuel Hinds' book describes this dynamic more fully, with cases from Latin America and Asia.

This bad dynamic is why governments who want an independent monetary policy usually have to forbid people from buying FX to take advantage of higher world interest rates and appreciating FX. This policy is called "capital control." (The word "capital" refers to financial securities. "Exchange" control may refer to government controls on getting FX to import goods and services.)

But can the government get global investment in the local economy while also preventing people from selling their shares and buying FX to their money back again? Probably the country's access to global investment is going to be hurt by capital controls. So what local industry gains from lower-cost local credit may be offset by losing access to global investors.

Also, developing countries have histories of using credit policy to subsidize favored firms with directed credit and preferential access to FX for imports, sometimes at preferential prices (the "multiple" exchange practices that are forbidden by the IMF's Articles of Agreement). These practices can be corrupting.

A (hopefully) amusing portrayal of the worst-case scenario forms the prologue to Mr Hinds' book. As bad as the book's scenario seems, it points out how actual experiences in several countries has approximated that scenario.

The steps of the scenario represent the results of using control over a central bank to try to spend more than 100% of national income. Each step starves some part of the economy of resources, with the remedy to the previous step always reproducing the same underlying conflict in a different sector — but constantly expanding the conflict until it consumes the whole economy.

The KOM textbook points out the existence of "contagion" in developing-country (mini-currency) exchange rates. This externally generated instability suggests that mini-currencies are the opposite of a safety net when an offshore financial crisis starts.

This shows that managing currencies has the character of a "public good," in the economists' sense of having external effects that don't directly affect the country whose exchange rate is fluctuating. A single country cannot control the fate of its own mini-currency if other currencies are fluctuating.

Currencies' public-good nature means that it would be beneficial for sovereigns to cooperate in their currency policies.

So, let's put on our "global" hats and think in terms of the options the world's sovereigns have for cooperative currency management.

If there were a consensus on the best ERA that all the sovereigns could agree on and institutionalize, the IMF's policy would reflect it.

But in fact, the IMF is officially neutral on which ERA a member should choose.

This was not always the case, as the IMF was designed for a particular ERA that did reflect a consensus — the Bretton Woods system of fixed parities.

The IMF's present official neutrality is based on several things.

* First, evidence connecting macroeconomic results to ERAs is inconclusive, and we saw by reviewing the KOM textbook's discussion.
* Second, different countries are in different currency situations, as we have seen in reviewing the difference between global reserve currencies and mini-currencies. This might imply that different ERAs would be appropriate for different situations.
* Third, the Fund's leading members — the U.S. and the EU — are issuers of the main global reserve currencies and have continental-sized economies that are less dependent on the outside world than smaller developing countries are. So (as we can see in the IMF's "De Facto Classification of ERAs" table) the U.S. and the EU have the luxury of not having to worry much about their exchange rates. Also, they wouldn't benefit as much as smaller economies might from cooperating with other currency areas.
* Fourth, the Fund's leading members differ substantially on the question of integration of the post-1945 national currencies into shared regional currencies — particularly on the euro, which Europe has implemented while the U.S. expresses skepticism.

As a result of its neutrality, the IMF tries to help each member country manage its ERA choice as best it can, without insisting *a priori* on any particular ERA.

Unofficially, however, IMF staff tend to agree that, if a country is going to have its own currency, then either it must have sufficient OIR to supply whatever amount of FX the market may demand at a given exchange rate — which means in principle that the country needs to have a currency board — or it must accept that the exchange rate is going to fluctuate with market pressures.

In the latter case, setting monetary policy to try to maintain low price inflation — "inflation targeting" — is the priority goal that IMF staff see for monetary policy.

But as regards currency cooperation, the IMF doesn't have a policy that favors it or a plan for the best way to cooperate, if a country wanted to.

As the IMF leaves us to our own devices, we have to think about it on our own.

Let's start by reviewing the historical experience on international cooperation on currencies and exchange rates.

In the hundred years from the 1870s to the 1970s, the industrialized economies consistently tried to put their currencies into a common framework, where exchange rates were generally fixed. After each of this period's great crises — the 1914 war, the late 1920s financial meltdown, and war again at the end of the 1930s — the industrialized countries tried to knit currency cooperation back together again, modernizing the framework to make it more suited to economic and financial conditions.

A new era started in the 1970s, a decade that saw increased financial volatility, less government control of the financial sector, and greatly expanded financial institutions and products. Internationally, these circumstances led to abandonment of the century-long consensus on having a common framework for currencies and exchange rates and adoption instead of the ideology that favors letting private currency traders establish exchange rates within a government system of separate, independent currencies.

While the new era has continued for almost fifty years, dissent has not been absent.

* Most of Western Europe put their currencies back into a regional framework in 1979 (the "European Monetary System"), leading to the European Monetary Union and the euro in 1999.
* Regional currency arrangements also exist the Caribbean and Africa.
* Several countries have adopted the currency board system.
* Countries have adopted a foreign currency (for example, El Salvador, Ecuador, and Kosovo).

The following slides offer a quick review of some details in the historical evolution. Then we'll turn to the options within the current system.

The classic solution to joint currency management is to base all currencies on a commodity that is universally accepted. Gold is everyone's favorite, but silver, real estate, and other commodities have been used too.

In the 1800s, several regions standardized coins so that they could be used across jurisdictions. In Europe, there were the German, "Latin," and Scandinavian monetary unions. In East Asia, there were interchangeable silver coins minted in Mexico, the U.S., France, the UK, and Japan.

In the late 1800s, gold became main reserve currency in the industrialized countries so that international payments could take place at relatively constant prices, especially between the UK — the era's main source of international finance — and the other countries. Gold thus became the main central-bank money, in the sense that the main industrialized countries' central banks were willing to settle deficits in payments between their territories by shipping gold.

The stock of commodity moneys, including gold, inevitably became smaller and smaller relative to the size of the global economy. Gold reserves became smaller and smaller in propotion to circulating currency, mainly bank money. The "constancy" of gold eventually made it irrelevant.

The Bretton Woods system that succeeded the Gold Standard substituted a core currency, the USD, for gold. Unlike the case of gold, which became too scarce, the USD gradually became too abundant thanks to internal USG polices. In addition, the fixed parities between the various currencies were both disrupted by the growth in cross-border financial flows and the fluctuating prices of the 1960s and 1970s.

In the early 1970s, not only was the Bretton Woods system was abandoned but in addition the century-long consensus on having a system that integrated currencies was challenged. The alternative claim was that "the magic of the marketplace" would find a set of exchange rates at which all countries' BOP would be in a structural balance.

That hope was never realized.

For one thing, the 1970s turned out to be a period of volatile price changes, including major changes in crude oil prices (the OPEC crises), grain prices, and other commodity prices. Inflation accelerated globally, reaching 20% per year in the U.S. at the end of the decade. Some industrialized countries even sought IMF support through Stand-By Arrangements in the 1970s.

Not only did currency exchange rates have to adjust to these price changes, but financial institutions in general had to change how they did business. Commercial banks that traditionally paid no interest on deposits lost deposits as businesses and households shifted funds to non-bank institutions that were paying interest. So, banks started raising deposit interest rates to compete (with the help of loosened regulations). This meant that banks' interest costs rose and became volatile, setting the banks up for potential debt crises — as described in the course's modules on banking regulation and on financial crises.

Internationally, banks that had never made many foreign loans found themselves full of "petrodollars" (deposits from OPEC exporters), while at the same time developing economies needed loans to import higher-priced fuels. Bank loans to "recycle" the petrodollars from oil exporters to oil importers were potentially profitable, but they also exposed the banks to the commercial risk of oil importers — mostly developing countries' — structural imbalances.

That risk was realized: "by 1982, the nine largest U.S. money-center banks held Latin American debt amounting to 176 percent of their capital," and then "in August 1982, ... [the] Mexican Finance Minister ... informed the Federal Reserve chairman ... that Mexico would no longer be able to service its debt ... . Ultimately, sixteen Latin American countries rescheduled their debts."

This made the main U.S. banks insolvent. But because their lending had been encouraged by the USG during the oil crises, the USG also allowed them to work their way out of insolvency, rather than forcing them into legal bankruptcy.

(See: <https://www.federalreservehistory.org/essays/latin_american_debt_crisis>.)

In addition to banks exposure to the risk of international debt crises, currency risk became a factor for banks. If they accepted deposits or borrowed in one currency to loan in another currency, they would lose money if the value of the loan currency fell relative to the currency that they had to repay to depositors. If they made the borrower repay in U.S. dollars, then the bank might lose anyway if the borrower went into a payments crisis and ran out of FX.

The course's Banking Regulation module noted that the Basel Process has tried to address the risk of international banking in the post-1971 environment, including by recommending standards for national regulation of commercial banks' exposure to currency risk.

With respect to avoiding or managing fluctuations in mini-currencies' exchange rates, the essential rule of the system, as managed by the IMF, is to avoid borrowing excessively in global reserve currencies. Although economic development should attract resources from global-reserve countries to developing countries, borrowing in FX can also produce a combination of local-currency price inflation (making exports less competitive, encouraging imports, and thus drawing down FX reserves) and real-estate and stock price bubbles (leading to bankruptcies and banking crises). These impacts can start a process of currency depreciation, as illustrated by Hinds' discussion.

The main policies for avoiding these risks are inflation targeting and capital controls.

* Inflation targeting, which the IMF favors, is the use of monetary policy to prevent easy credit from pushing prices up.
* Capital controls, which the IMF is ambivalent about, are government regulations that cap or at least regulate borrowing in FX. Governments can also tax short-term FX transactions to raise the cost of potentially destabilizing high-frequency currency speculation, without greatly affecting long-term investment transactions.

As shown by the graphic in this slide, another adaptation to the risk of exchange-rate instability has been that emerging-market countries that are "inflation targeters" have engaged in a massive build-up of FX over the past twenty years. Currency-board systems also depend on ample FX backing to ensure their parities.

The pre-1971 idea of multi-country coordination of currency and exchange-rate management was not entirely abandoned in favor of fluctuating market exchange rates, of course. As the global review of post-1971 currency landscape showed, a number of countries have chosen eith to peg their currency's exchange rate with another country's currency or to adopt a form of international currency integration:

* A regional currency.
* A currency board based on another country's global reserve currency.
* Adoption of another country's global reserve currency.

This section will explore the currency integration options.

Currency integration differs fundamentally from pegging the exchange rate of a separate, independent currency.

Pegs are numerical policy variables. Countries with pegged mini-currencies have all the institutional infrastructure needed to change the peg at any time. Everyone recognizes that pegged exchange rates can change and indeed are unstable.

On the other hand, a country that is using a foreign or regional currency lacks the institutional levers to affect its exchange rate, without a long effort of institutional change

Currency integration can be done unilaterally by adopting the currency of another country, or cooperatively by the joint action of the two or more parties involved. Let's look first at unilateral approaches and then at cooperative approaches.

There are two main ways of unilaterally adopting an existing foreign currency. Either you can use the foreign currency as your currency for transactions, or you can use it as the reserve currency in a "currency board" system with a local currency representing it in transactions.

The currency board system was described in [a previous slide](#CurrBoard). In what sense is it "currency integration"?

The public should be able to view the local currency as being essentially a denomination of the currency board's reserve currency.

* In the U.S., we have five-dollar bills and ten-dollar bills. As means of payment, they have slight differences in usefulness, so that we might want two five-dollar bills sometimes and a single ten-dollar bill at other times. But we recognize that they are part of the same currency. Your bank will substitute one ten for two fives without question.
* In a currency-board country, the local currency has a convenience factor in its favor as a means of payment in many transactions. But there is no doubt in the public's mind that it can be exchanged at the bank for a fixed equivalent in the base currency, whenever that is convenient to the user. In that sense, they are part of the same currency.

As noted earlier, a substantial number of smaller territories have adopted foreign currencies — usually global (or at least regional) reserve currencies. The public's bank accounts and pocket cash are in reserve currencies, although local notes or coins may circulate alongside the foreign ones, at fixed values.

The banking system holds its reserves as deposits in the banks of the reserve currency's country, from which they get currency notes and coins for their customers. They typically get no services from the reserve currency's central bank. Like all banks, they depend on relationships with other banks (the interbank market) for liquidity, but they do not have emergency access to the central bank the way the banks in the reserve currency's territory do.

El Salvador has adopted the USD as its currency, but its banking sector, including the central bank, has no special access to the U.S. Federal Reserve. (In contrast, the European Central Bank serves all the country-members of the European Monetary Union.)

Furthermore, even after adoption of a foreign currency there are still many other currencies whose values continue to fluctuate relative to the currency you've chosen. Argentina's attempt to integrate with the U.S. dollar through a currency board system did not prevent major fluctuations with Brazil's exchange rate relative to the dollar, which had major impacts on Argentina just as they would have had if Argentina had still had a separate, independent currency.

In considering unilateral currency integration, there are both push and pull factors. Factors that push you away from having a separate, independent currency include a history of currency crises and vulnerability of a small economy to changes in the cost of living due to exchange-rate changes.

Pull factors include demand by citizens for the convenience of having a global reserve currency, complementary forms of integration that are already in place, and the potential for cooperation from the authorities of the target currency.

The leading theoretical method for evaluating the option of currency unification is called "Optimal Currency Area" theory, which is based on pull factors. It is based on the observation that cross-border integration is multi-dimensional, and it concludes that currency integration's benefits depend on complementary integration in other dimensions.

Take the example of labor markets and currencies. Unifying the labor market of two neighboring countries would increase the daily flow of people across the border, making transactions on each side. Labor-market integration thus makes separate currencies more inconvenient than before and raising the benefit from unifying them into a single currency.

Note that this complementarity operates in both directions. Not only does labor-market integration make currency integration more beneficial, but conversely unifying the two currencies into a single one reduces the costs of paying employees who come from the other side of the border, making it easier and less expensive to unify the labor market.

Ideally, however, currency integration would not be unilateral but rather would be cooperative and supported by a global policy framework.

Currency unions seem more attractive than the limitations and risks of mini-currencies, especially if the union's currency can achieve the status of a global reserve currency. The EMU has done this, and the ECCU in the Eastern Caribbean attempts to do it through having a currency-board arrangement with the USD as their reserve currency.

A leading issue with currency unions is the relationship between the union's central bank and the members' governments and banking systems. Compared with national central banks that are presumably responsive to local needs, a union's central bank may not be so responsive to individual members' fiscal situations or to their commercial banks.

The EMU's experience in the 2010 debt crisis illustrates this issue, as the European Central Bank was caught between the interests of Germany's banks and Greece's banks.

That experience highlighted the need to complement currency unions with fiscal and banking-sector institutions that are responsive to the union's whole territory, and the EMU has indeed created some new institutions in response to those lessons learned (as was noted in the course's Financial Crises module).

Given the lessons learned about unifying separate currencies, it would be useful to institutionalize those lessons, perhaps in an organization that helps countries who are considering currency unification.

However, there is no general agreement or institutional mechanism that supports and facilitates currency integration. The IMF does not institutionally oppose currency integration but has no doctrine or institutional mechanism that supports or facilitates it.

This may bias countries towards unilateral measures.

A free-trade area has more than once been a steppingstone to a currency union. The German mark was created in the mid-1800s out of predecessor currencies (mainly the *thaler* in the north and the *gulden* in the south), after the German-speaking states who used those currencies had established a customs union (*Zollverein*). (Both customs and currency integration may be steps towards political integration.) A century later, the German mark became, in its turn, one of the predecessor currencies integrated into the EUR, in part to avoid having currency and exchange-rate conflicts interfere with the highly successful Western European free-trade area.

The case of the difficult internal integration of the U.S. dollar illustrates some of the issues involved with currency integration.

The U.S. Constitution, which was adopted in 1789, uses the word "dollars" twice, but it is referring to the Spanish trade dollar, the "*real de a ocho*" (literally, the "piece of eight" that children in the U.S. hear about in pirate stories), a silver coin that was the dominant cross-border currency in the U.S. at that time. So, while in the early 1800s the U.S. dollar was defined in terms of silver as the U.S. unit of account, there was relatively little circulating currency issued by the U.S. Government.

Currency for business purposes was, as it is today, largely created by banks, but without the consistent USG oversight of banking that we have now. Private interests at the state level succeeded in eliminating the bank chartered by the USG, the Bank of the United States, that had attempted to ensure banking standards, and there followed a period from the 1830s into the 1860s where banks were state-chartered, with many being poorly supervised and even frauds ("wildcat banks").

Bank liabilities that served as currency (printed notes and checks on deposits) were often doubted by the public because of banking instability (and fraud). Therefore, they would be discounted (accepted at less than face value) on account of both risk and the cost of redemption at the issuing bank's offices. The discounts amounted to "exchange rates" between the moneys emitted by different banks.

The barriers to national standards for U.S. currency were overcome during the great rebellion of the 1860s, when the rebels who had objected to national currency integration stayed away from Congress. Also, the USG needed to emit notes to pay military expenses. There resulted acts of Congress in 1863 and 1864 under which a national currency system was set up.

Under these acts, the USG chartered what were called "national" banks to dominate note issue. The USG ensured by law that the nationally chartered banks' note issue would be unified, as every national bank had to accept the notes and checks of other national banks at par, with no discounting. In other words, the "exchange rates" between currencies formerly issued by state-chartered banks became history, and a unified system of national-bank notes and deposits — at a fixed, one-to-one parity between banks — took its place.

The national banks' notes were issued by individual national banks, but they were designed and printed by the new U.S. Bureau of Engraving, created in July 1861, to all look the same as one another.

The USG's Comptroller of the Currency, created by the National Bank Act of 1863, oversaw the chartering of national banks and supervised those banks' currency issuance. However, there was still no central bank to protect individual commercial banks and the U.S. banking system remained crisis-prone through the 1800s. The 1907 crisis was the last straw, leading to creation in 1913 of the Federal Reserve system, which became the commercial banks' lender of last resort.

It took until the 1930s before the Federal Reserve learned the lessons of central banking taught by the U.S. banking sector collapse in the Depression. In 1935, folding currency in the U.S. became mainly Federal Reserve notes and the private national banknotes were retired.

To this day, however, the Fed mimics the old system by attributing each Federal Reserve note to one of the twelve privately capitalized district Federal Reserve banks. Besides reflecting U.S. political culture, the USG's artifice of a currency composed of twelve regional central-bank currencies illustrates the tools used to forge a union of currencies.

* A legally fixed exchange rate (one-to-one in the U.S. case).
* Banknotes printed to look like one another (except for, in the U.S. case, some fine print indicating which of the twelve Reserve Banks each note belongs to).
* A common source supplying commercial bank reserves (in the U.S. case, purchases of U.S. domestic assets by the Trading Desk of the New York Federal Reserve Bank).
* A common lender-of-last-resort policy for support of commercial banks who are solvent but who are having trouble acquiring liquidity by borrowing from private sources (in the U.S. case, common lending — "discount" — interest rates for all twelve Federal Reserve banks, set nationally by the Federal Reserve Board in Washington, DC).

For the moment, there is no global institution or policy understanding that supports cooperative currency integration, despite the example of past currency integration episodes in leading economic powers like the U.S. and Germany.

Unilaterally or regionally integrated currencies remain embedded in a global system with many currencies whose exchange rates change substantially. The global system undercuts partial integration efforts through the currency crises that are endemic to a system with many currencies.

It's unclear when this system might change. There are global developments, both in the Eurozone and in East Asia, that might disrupt the existing system and lead toward broader currency integration. On the other hand, the existing global reserve currencies work more or less well for several of the main sovereigns — like the U.S., the UK, Germany, and Japan — whose cooperation would be needed to establish a new system.

One question that is asked is whether the IMF's Special Drawing Rights (the SDR) would potentially provide the basis for a global currency.

As explained earlier, the SDR is a unit of account used to quantify IMF members' access to reserve currencies from other members. When the IMF makes SDR available, it empowers a reallocation of existing national reserves. When the IMF provides SDRs to members who need reserves from members for whom reserves are in surplus, the IMF allows its members as a group to get more utility out of their existing reserves.

This process is made more fluid when the IMF "allocates" more SDRs to member countries, as it did at the time of the great financial crisis in 2009 and the Covid-19 pandemic in 2020. In this context, the term "allocation" refers to providing IMF members with SDRs that they can use to buy available reserves without having to enter into an agreement, like a Stand-By Arrangement or an Extended Fund Facility, with the IMF.

But the reserves themselves are still created by the members' own central banks and are only available through the IMF if the members agree to make them available. Furthermore, the system that the SDR is part of does nothing to eliminate variable exchange rates between existing currencies

For the SDR to become the global reserve asset, the central banks of all IMF members would have to deposit their assets in the IMF in exchange for SDRs (or for a new IMF money), which would become the national central banks' new reserves, and the IMF members' central banks would furthermore have to agree not to provide commercial banks in their jurisdiction additional reserves unless they, the national central banks, receive additional IMF reserves that only the IMF could create.

This would globalize monetary policy, but it would still not globalize the currency. To achieve that, IMF members would have to do what European Monetary Union members did and irrevocably fix exchange rates.

Since nothing is irrevocable for a sovereign, IMF members would have to take an institutional step like replacing their existing currencies for a global currency with a new name and new banknotes. Otherwise, with the legacy currencies still circulating, albeit at "permanently" pegged exchange rates, the institutions would always be in place for an IMF member to revalue its currency at any moment.

Furthermore, the EMU's experience in southern Europe's debt crisis of 2010 suggests that, for a global currency, complementary banking supervision and support institutions are needed. The BIS's Basel Process might be a framework. Furthermore, fiscal coordination is likely to be necessary, and the World Bank-IDA process only suggests what this might look like.

Thus, while the existence of the IMF and the SDR have elements upon which IMF members could build to achieve global currency integration, such integration is not the purpose of the IMF or the SDR and would require basic decisions about major institutional changes to be made by the world's sovereigns.

IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions* (2022).

Pages 9-12 (Table 4):

"De Facto Classification of Exchange Rate Arrangements, as of April 30, 2021,

and Monetary Policy Frameworks"

(Click [here](#Table4Discussion) to go back to the discussion of this table.)





