

13. Chartalism, Metallism, and Key Currencies

In terms of our hierarchy of money and credit, we have so far been paying most attention to currency and everything below it, so our attention has been on two of the four prices of money, namely par and the interest rate. Today we begin a section of the course that looks into forms of money that lie above currency in the hierarchy, and hence at a third price of money, the rate of exchange.

Metallism

Under a gold standard, the extension of our analysis would be straightforward. Gold is the ultimate international money, an asset that is no one's liability. Under a gold standard, each currency has its own mint par, and the exchange rate is determined by the ratio of mint pars. In this view of the world, the multiple national (state) systems relate to one another not directly (money to money) but only indirectly (credit to credit) through the international (private) system. Each national currency has an exchange rate with the international money and it is that pattern of exchange rates that sets up a pattern of exchange rates between national currencies.

Dollar = x ounces of gold
 Pound = y ounces of gold
 Dollar = x/y Pounds [S(1/x)=(1/y)]

Exchange Rate in a Metallic Standard World

Gold		
	X oz.	Y oz.
Dollar	S=X/Y	Pound
Deposits		Deposits
Securities		Securities

From this point of view, the central bank is a **banker's bank**, holding international reserves that keep the national payment system in more or less connection with the international system.

This mint par ratio idea does not work exactly in practice because of the cost of shipping gold around; sometimes the currency trades higher and sometimes lower. This idea can be rationalized within the metallist frame by using the covered Interest Parity relationship.

CIP: $[1+R^*(0,T)]S(0) = [1+R(0,T)]F(T)$

where we think of the cost of shipping gold as putting lower and upper bounds on S:

$$X/Y - \delta < S(0) < X/Y + \delta$$

Spot rates, and even more so forward rates, can move away from mint par, and so can foreign and domestic interest rates diverge a bit, all within the limits provided by the gold points. You probably feel an application of the Treynor model behind the scenes here, and that is exactly what we'll do but not yet. The prior question is whether this line of analysis is useful at all in the modern world, since we are not on a gold standard. Let's look at the world, and the facts that any adequate theory would need to explain.

The Facts

Figure 1 maps current arrangements, in which the dollar serves as world reserve currency. According to the most recent BIS numbers, 51 percent of the volume of foreign exchange trading involves only a few major currencies—the dollar, euro, yen, and sterling—and fully 84.9 percent of trading volume has the dollar as one leg of the trade. This latter institutional fact has led one participant-observer to opine that “the foreign exchange market is largely the price of the dollar” (DeRosa 2011, p. 4). But it is important to appreciate that the dollar in question is substantially the international private dollar, which is to say bank money not state money.

Figure 1

	Asia	US	Europe
Reserve Currency		International Dollar	
Key Currency	Yen	Domestic Dollar	Pound Sterling, Euro
National Currency/ National Deposits/ National Securities	Australian Dollar	Canadian Dollar	Swiss Franc

Further, the hierarchical character of the FX market is more than the special role of the dollar relative to everything else. The finer texture of the hierarchy is reflected in the language of

trading, which distinguishes “majors” from “minors”. The majors are high volume, liquid markets, with tight bid-ask spreads, and all majors have the dollar as one leg: EUR/USD, GBP/USD, AUD/USD, USD/JPY, USD/CAD, USD/CHF. So-called “cross-currency” pairs have no dollar leg, but “euro-crosses” have a euro leg.¹ The minors trade as cross-currency pairs with some major as the other leg. With only a few exceptions, minor cross-currency pairs do not trade.

The hierarchical organization of spot FX markets carries over also into FX derivatives markets: forwards, futures, and options. Most derivative trades have the dollar as one leg, and most also involve other majors, not minors. By volume, the derivative market is larger than the spot market. Of the \$4 trillion a day of FX trades, \$1.5 trillion are spot transactions while \$1.8 trillion are FX swaps, and the remainder are outright forwards (\$.5 trillion), options and exotics (\$.2 trillion), and currency swaps (\$43 billion). The overwhelming majority of the market is short term; the FX market is fundamentally a money market, not a capital market.

These are the facts, but how shall we understand them? In particular, how do we understand the value of a currency that is not convertible into any metal, and how do we understand the relative price of two such currencies. The mint-par anchor of the gold standard system is nowhere to be seen, and we find ourselves intellectually adrift.

Chartalism

I have stated the problem as if it were a new one, arising from the breakdown of the gold standard, but in fact it is ancient. Joseph A. Schumpeter, in his magisterial History of Economic Analysis (1954), identifies two traditions in monetary thought that he calls chartalism and metallism. **Chartalism** proceeds analytically by thinking of money as a creation of the state, or the king. The quintessential form of money is fiat currency, a piece of paper with the king’s image on it that costs essentially nothing to produce. By contrast, **Metallism** proceeds analytically by thinking of money as a creation of private business. In this tradition, the quintessential form of money is some precious metal, not the liability of anyone, and all lesser monies are promises to pay that ultimate money.

Why are there these two traditions? Both trace their origins to the distant past when in fact there were two parallel monetary systems operating at the same time.² Within nations, the hand-to-hand currency used by the common people was the king’s money (and its credit derivatives); the chartalist tradition grew up to explain how that money worked. Between nations, the money used to facilitate international wholesale trade between businesses was a metallic currency (and its credit derivatives); the metallist tradition grew up to explain how that money worked.

¹ Before the current Euro crisis, some people thought that the Euro might emerge as a challenger to the dollar, and as a consequence certain euro-crosses were for a while considered majors.

² See Fernand Braudel, Wheels of Commerce, and especially Boyer-Xambeau, Deleplace, and Gillard Private Money and Public Currencies: The 16th Century Challenge (1994).

	Public/Retail	Private/Wholesale
Money	King's Money (Base)	International Money (Gold)
Credit	Domestic credit	International credit

The exchange rate was fundamentally a relative price between domestic and international currency, both of which circulated side by side. There was no mint par to anchor the value of domestic currency, and yet it had value. Why so? Further, the value of the king's money seemed secularly to fall relative to the international money. Why?

Historically, domestic coinage was the king's prerogative and, given the undeveloped tax system, kings frequently used that prerogative as a source of funds to finance state projects. (Similarly, in more recent history, domestic coinage has been the prerogative of the state, and we have seen in the Young reading how the Civil War was financed in part by greenback issue.) From a chartalist standpoint, the central bank is just a creature of government finance; it is a **government bank**. By monopolizing the issue of currency, the government monopolizes the cheapest source of finance in the nation.

Treasury		Government Bank	
Assets	Liabilities	Assets	Liabilities
Authority, especially taxing authority	Tbills 5%	Tbills 5%	Currency 0%

The government also gains access to a further possible source of finance, which arises from depreciation of the value of the currency, depreciation which diminishes the value of both currency and any debt denominated in that currency that might be outstanding. The central bank is just a way of issuing zero-interest debt, debt that can furthermore be repudiated over time as need be by the simple stratagem of inflation.

For drawing out the full implications of this point of view, it is helpful to take advantage of a certain affinity between the chartalist view of the money standard and the quantity theory of money.

$$MV=PT$$

Quantity Theory of Money

The quantity theory does not question that the government has the power to assert what is money, but it points out certain limits to that power. If the government issues more money than people can use, any excess just depreciates the value of money. Just so, if we think of the volume of transactions T as determined by the patterns of real trade, and velocity of money V as determined by monetary institutions, then an overissue of money on the left hand side can only show up as an increase in the price level on the right hand side. From this point of view,

inflation ($\Delta P/P$) is caused by and is a symptom of the government's irresponsible expansion of money, an overreaching of state power.³

We can expand this point of view to consider international exchange between states by thinking of each country's price level as determined by the quantity of money issued in that country. Then the exchange rate between currencies seems like a relative price linking two essentially valueless currencies. Define S as the number of pounds that exchange for a dollar (so when S goes up that means the dollar appreciates, or becomes more valuable). Then we have the idea that

$$SP=P^*$$

Purchasing Power Parity

or
$$\Delta S/S + \Delta P/P = \Delta P^*/P^*$$

In this way of thinking, exchange rates reflect differential scarcity of two fiat monies, and changes in exchange rates reflect differential inflation rates, which are understood as arising from differential money growth rates. This is one way of looking at the problem of exchange rates, and it makes a certain amount of sense in a world of fiat currency.

Exchange rate in a Fiat Money World Parallel National Hierarchies

Dollar	$S=P^*/P$	Pound
Deposits		Deposits
Securities		Securities

This is a coherent theoretical structure, to be sure, but it doesn't seem to describe real economies very well, at least in the short run. There is a lot of slippage between M and P in the quantity equation, and even more in the purchasing power parity equation. One way to think about the problem is to observe that price levels move very slowly but exchange rates and monetary quantities fluctuate rapidly. Advocates of the chartalist theoretical tradition therefore argue that the theory is about the long run tendency of the system. But in the long run doubts arise about the direction of causation. Money and prices move together, to be sure, but maybe prices drive money rather than vice versa, especially under modern conditions where most money is actually credit? And maybe exchange rate movements drive domestic prices, rather than vice versa?

I mention these doubts not so much as decisive criticisms, but merely to suggest that we keep our minds open about alternative theoretical possibilities. As further motivation, I want to observe that **PPP thinks of the exchange rate as the relative price of goods, whereas CIP**

³ The assumption that V and T are independent of monetary expansion leaves out reaction of the money holding public to hold less money (in real terms) if they are expecting inflation. It also leaves out the reaction of issuers of private credit promises to pay the king's money, which promises may serve a close substitutes for money.

thinks of the exchange rate as the relative price of assets. This is the economics view versus the finance view. But neither thinks of the exchange rate as the relative price of money, which is the money view. To get that into the picture, we need to adopt a payments and marketmaking perspective.

A Money View

We start with what Minsky (1952) called the “survival constraint”, which for our purposes might better be called the “reserve constraint” since it focuses attention on the end-of-day clearing in a multilateral payments system. Every day payments go in and out, but at the end of the day net payments must be settled. If a country has sold more than it has bought, it is a surplus country; if a country has bought more than it has sold, it is a deficit country. The survival constraint is the requirement that deficit countries find a way to settle with surplus countries.

In present conditions, the world reserve currency is generally the dollar so, without loss of generality, we can say that the deficit country needs to acquire dollars. Possibly it has a small reserve holding but more generally it will need to acquire dollars in world foreign exchange markets. Either way, the point to emphasize is how this need to acquire dollars disciplines the behavior of the deficit country. If it cannot acquire the necessary dollars, it will be unable to complete its purchases, and some of its transactions will have to be reversed.

Figure 1 shows a stylized example of how a deficit country might acquire dollars by relying entirely on the **private FX dealing system**. This is only the starting point; the role of central banks will be introduced later.

Figure 1

Surplus Country		FX Dealers		Deficit Country	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
\$10 due from					\$10 due to
-\$10 due from		+10S FX spot	+\$10 spot	-\$10S FX spot	-\$10 due to
+\$10 spot		+\$10 term	+\$10S FX term		
		+\$10S FX term	+\$10 term		

The first row shows the net positions of the two countries before settlement.

The second row shows how the FX dealer system facilitates settlement by creating credit, specifically a spot dollar liability which we suppose the deficit country buys from the dealer at the spot exchange rate using local currency, and then transfers to the surplus country. The consequence is expansion of the dealer's balance sheet on both sides, expansion that exposes the dealer to exchange risk, namely the risk that the dollar price of its new FX asset might fall.

As a hedge against this price risk, the second line further shows the dealer entering into an offsetting forward exchange contract by borrowing term FX and lending term dollars, taking its cue from the Covered Interest Parity condition. (Taking our own cue from CIP, we adopt the convention of booking forward transactions as a pair of term credits, lending in one currency and borrowing in another.) At the end of the day our FX dealer has “matched book”—if the dollar price of its new FX spot asset falls, then so also will the dollar value of its new FX term liability. It does however still face liquidity risk since maintaining the hedge requires rolling over its spot dollar liability position until maturity of its term dollar asset position.

The third row shows the position of a second “speculative” dealer who provides the forward hedge to the first dealer. This second dealer does not have matched book and so faces exposure to exchange risk, but in the forward market not the spot market. (In practice he might himself hedge with a futures position, or an FX options position, but that doesn't eliminate the risk, only shift it to someone else.) In effect this second speculative dealer is engaged in a “carry trade”, paying the dollar interest rate and receiving the FX interest rate. If the realized spot rate is different from the forward rate, this speculation will make a profit or a loss.

I have been treating these two dealers as private agents, but in fact they might be central banks, and in general both private dealers and central banks are involved. In major currencies, the action is mostly with private dealers. In minor currencies it is mostly with central banks. We will expand on this point in future lectures.

Private and Public Money: From Parallel Systems to Integrated Systems

I have presented two traditions in monetary thinking. Metallism arose from attempts to understand the private international money system, Chartalism arose from attempts to understand the public domestic money system. Let me now observe that neither of these traditions seems to be very well lined up with the current facts, as I have described them. The modern system is not a parallel money system but rather a hybrid or integrated system. How did this come to pass?

Historically, wars have provided the opportunity for kings to discover the usefulness of the private money system. During wars, governments face a dire need for funds, and typically the kind of funds they need are metallic not fiat, in order to pay for crucial war materials. The private metallic system can provide gold since it runs on metallic reserves.

Suppose, as was usually the case, there is a banker's bank separate from the government bank, and suppose such a bank issues deposits against a 100% gold reserve. (Think of a clearinghouse, which we have already seen is a kind of primitive central bank.) I am showing

here parallel money systems, although it could be said that the private gold money is better, i.e. higher in the hierarchy.

Prewar Parallel Banking Systems

Government Bank		Private Banker's Bank	
Assets	Liabilities	Assets	Liabilities
Treasury bills	Domestic Currency	Gold Private Credit	Deposits

Now consider what happens when the government borrows from the private bank and takes payment in gold.

Wartime Hybrid Banking System

Government Bank		Private Bank	
Assets	Liabilities	Assets	Liabilities
Treasury bills +Gold	Domestic Currency +Loan	-Gold +State Loan	Deposits

Now consider what happens when the government repays the loan in currency and bills (not repayment really, just refinancing), holding onto gold as the international reserves but requiring banks to use its own currency as domestic reserves.

Postwar Hybrid Banking System

Central Bank		Private Bank	
Assets	Liabilities		Liabilities
Gold Treasury bills	Currency	+Currency +Treasury bills	Deposits

In return for financing the king's war the bankers gain the right to issue forms of money that compete with the king's money. It is a win-win. In the pre-war parallel system, domestic credit was tied to the inferior king's money, and so repressed, with bad economic effects. International credit was tied to the superior international money, but inaccessible to most people. The hybrid structure brings more credit to the king for war, and then more credit to the economy for peacetime expansion.

We have seen in Lecture 2 how Civil War finance created the national banking system, but not yet any national central bank. Indeed what passed for central banking took place in the

New York Clearinghouse, a private banker's bank. So the hierarchy remained with the private money on top and the public money below. The establishment of the Federal Reserve system in 1913 switched that hierarchy, putting public money on top in the domestic banking system. That proved enormously useful for the war finance that followed, but it stored up problems once the war was over because the Federal Reserve System left private money on top in the international gold standard banking system. This was a contradiction that would take another hundred years to work out, and it is not completely worked out even today.