A General Analytical Framework for the Analysis of Currencies and Other Commodities

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Keynes lashed out against neoclassical theory for treating capitalism as a barter or "real-exchange" economy, and offered his "monetary theory of production" as an alternative to the traditional approach based on the "Classical dichotomy." This aspect of Keynes's work has been developed by two traditions, the Post Keynesian and the Circulation Approaches (Deleplace and Nell, 1996). Post Keynesians have elaborated, among other topics, the relation of money (and money contracts), uncertainty, and historical time (Davidson), asset pricing and financial instability (Minsky), and endogenous money and credit creation (Moore, Wray). While Post Keynesians have generally emphasized money as a stock of wealth, circuit theory (Graziani, Parguez, Schmitt) has highlighted the importance of a rigorous analysis of the circulation of money for understanding the operation of capitalist economies, including the principle of effective demand.

Both Post Keynesian and Circulation Approaches accept the widely held view that modern money is not commodity money but rather token (or fiat) money (see, e.g., Moore, 1988; Graziani, 1988). But they criticize conventional theory for continuing to utilize a framework that treats modern money as though it were still a commodity money. This paper begins with two comments on this fundamental point. First, while modern money does not derive its value from its status as a commodity, once a token is declared necessary for the payment of taxes it can be analyzed like any other commodity. Second, absent from most Post Keynesian and Circuit analyses is the institutional process by which a token obtains its value (becomes money). Many analyses "add in" government spending and taxation, and the central bank, after an initial investigation of the operation of a private money-using economy (see, e.g., Lavoie, 1992, pp. 151-69).

Analyses of the circuit that begin with banks financing firms' production (or households' purchases) and end with firms (or households) paying back their loans leave unanswered the question of why anyone would initially sell real goods or services for the unit of account. The "common-sense" reply, "because they can use the funds to buy other goods and services" is not a satisfying one, for the further 'infinite regress' question remains the same: "why do those sellers want the unit of account?" What is missing is the process by which the unit of account is endowed with value.

This paper takes the position that the question remains unanswered because it cannot be (adequately) answered unless the State is incorporated from the very beginning of the analysis. "Money is a Creature of the State" (Lerner), and thus a "monetary" analysis cannot be conducted prior to the introduction of the State. Interestingly, the Chartalist view of a tax driven currency can be found in the writings of Keynes (not to mention Adam Smith!), the Post Keynesians, and the Circulation theorists, yet it is almost always presented as an aside, with the implications remaining unexplored (see Wray, 1998, on Smith, Keynes, and Post Keynesians such as Minsky; for the Circulationists, see Graziani, 1988).

In the Chartalist view, the State, desirous of moving various goods and services from the private sector to the public domain, first levies a tax. The State currency unit is defined as that which is acceptable for the payment of taxes. The imperative to pay taxes thus becomes the force driving the monetary circuit. The present paper seeks to refine the concept of the monetary circuit using a multidimensional model designed to reveal and illuminate the workings of a tax- driven currency. It will also be shown that this same model lends itself to the analysis of any commodity. In an adaptation of Moore's (1988) terminology, the model includes "horizontal" and "vertical" components of the monetary circuit. Following outline and discussion of the model, it will be utilized to dispel the myth that deficits imply future taxation, as well as to briefly analyze the 1997 Asian Financial Crisis.

The Vertical Component

We begin with the vertical component of the model, as presented in figure 1:

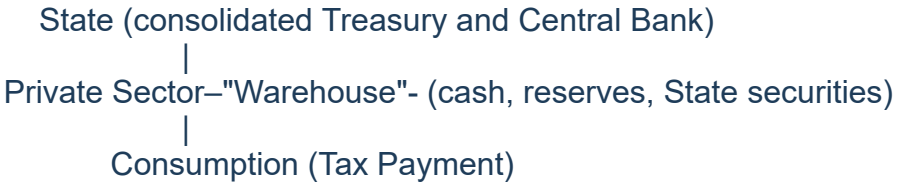

Figure 1: Currency Analysis: The Vertical Component

The tax liability lies at the bottom of the vertical, exogenous, component of the currency. At the top is the State (here presented as a consolidated Treasury and Central Bank), which is effectively the sole issuer of units of its currency, as it controls the issue of currency units by any of its designated agents. The middle is occupied by the private sector. It exchanges goods and services for the currency units of the state, pays taxes, and accumulates what is left over (State deficit spending) in the form of cash in circulation, reserves (clearing balances at the State's Central Bank), or Treasury securities ("deposits" offered by the CB). For comparative purposes later in the paper, this accumulation will be considered "warehoused." The currency units used for the payment of taxes (or any other currency units transferred to the State), for this analysis, is considered to be consumed (destroyed) in the process. As the State can issue paper currency units or accounting information at the CB at will, tax payments need not be considered a reflux back to the state for the process to continue. In fact, the assumption of such reflux would imply a function of that process that this analysis emphasizes does not exist.

This completes the basic vertical component. Agents are said to participate in vertical activity if they obtain the unit of account from the State, pay taxes to the State, or intermediate the process. Central bank policy determines the relative

distribution of the accumulated currency units of the private sector between cash, reserves (clearing balances), and Treasury securities. State (deficit) spending determines the magnitude of those accumulated financial assets.

The Horizontal Component

The horizontal component concerns the broad category of credit. In contrast with the vertical component, gross expansion of the horizontal component is endogenous, and nets to 0. The majority of circuit analysis begins and ends with the horizontal component. Even when the State is introduced, it too is assumed to behave horizontally. State taxing and borrowing are treated identically to private sector selling and borrowing. Though this treatment of the State may not be technically incorrect, the use of the vertical component adds a characterization of State activity previously ignored.

Any commodity has at least a vertical component. Horizontal activity represents leveraged activity of a vertical component. For analytical purposes, a unit of a currency is a commodity with no cost of production, no substitution, no inherent storage costs or transaction costs, and no product differentiation. Corn can be used to specifically demonstrate how a currency lends itself to the same analysis as commodities (figure 2a).

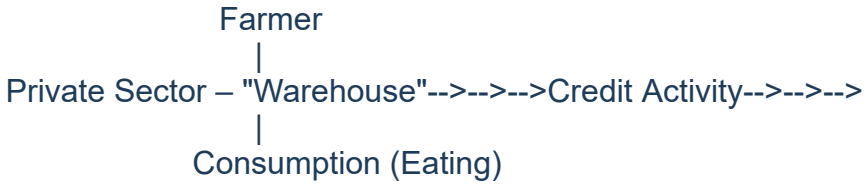

Figure 2a: General Commodity Analysis

With corn, the farmer can be considered at the top of the vertical component, and consumption (eating) at the bottom. The private sector remains in the middle, and transfers non corn (generally units of a currency) up to the farmer who sends down the corn in exchange. If the private sector purchases more corn than it immediately consumes, the difference is warehoused (accumulated). If we were to use the same language with corn as we do with currency, we would say that when the farmer exchanges more corn to the private sector than the private sector consumes, the farmer is engaging in the deficit spending of corn.

The corn futures market is a leveraging of physical corn. There is a short position for every long position. Likewise, the creation of bank loans and their corresponding deposits is a leveraging of the currency, and every short position, or borrower, has a long position, or depositor, on the other side of the ledger. The futures market also happens to be a market that leverages the currency, as corn, for example, is exchanged for units of the currency. Thus the horizontal component for currency analysis can be indicated by introducing credit into the picture (see figure 2b).

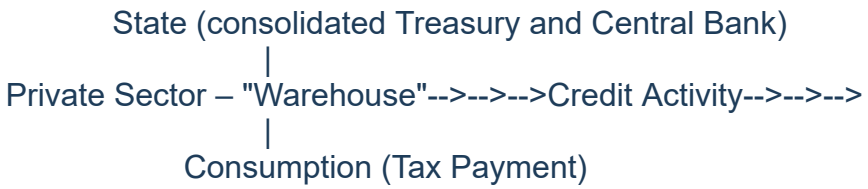

Figure 2b: Currency Analysis: Vertical and Horizontal Components

This model is consistent with the Post Keynesian notion that reserve imbalances can be reconciled only by the central bank. In this model, the horizontal activity always nets to 0. Reserves are clearing balances that can only come from vertical activity. Furthermore, in the US system, the Fed controls the mix in the "warehouse" and can, for example, by purchasing securities on the open market, decrease securities held by the private sector and increase reserves of the private sector (clearing balances). Because of deposit insurance, in effect the Fed guarantees that inter-bank checks will clear when presented at the Fed. This means that if the banking system doesn't have sufficient reserves as required by the Fed, at least one bank will be showing an overdraft at its account at the Fed. Such an overdraft is, of course, a loan from the Fed, and an example of vertical activity. So, in the US system, required reserves come from the Fed in one form or another on demand, and the Fed sets the terms of exchange–interest rate and collateral–for the transaction.

A Note on Pricing

The State is effectively the sole issuer of its currency. As Lerner and Colander put it, "if anything is a natural monopoly, the money supply is" (1980, p. 84). This means that the State is also the price setter for its currency when it issues and exchanges it for goods and services. It is also price setter of the interest (own) rate for its currency (Keynes, 1936, ch. 17) The latter is accomplished by managing the clearing balances and securities offered for sale. The corn farmer, however, is generally not the single supplier of corn, and therefore is not a price setter. In addition, as there is no central warehouse, or its equivalent, the "own rate" for corn is 0% or negative, reflecting only a cost of storage and a cost of short selling.

The model allows for two primary paths in the vertical component of a currency. The first is described above, and the second exists because it will be assumed that the State allows bank deposits to be used for payment of taxes. Therefore banks are allowed to automatically function as intermediaries between the State and the private sector. This happens whenever a bank draft (check) is used for payment of taxes. The banking system is simultaneously obligated to accept funds from the State on terms dictated by the State to cover clearing balances debited when such checks clear.

Initial demand for the currency- that which is necessary to pay taxes- originates with those with tax liabilities. When analyzing an economy, knowledge of the type of tax liabilities in force is fundamental to understanding its operation. For example, an asset tax, such as a property tax, will yield different results than a transaction tax, such as a sales tax, value added tax, or income tax.

Utilizing the Model

We now proceed with an example of how this model can be integrated into an analysis of the monetary circuit. In this example, we begin with the following assumptions:

1) The State has levied an equal head tax on all individuals.

2) The State hires only labor.

3) There is no net desire to save net financial assets (no deficit spending and no corresponding involuntary unemployment- see FEAPS, JPKE Dec. 97).

4) The State does not hire all the available labor (there is a private sector).

5) Producers qualify for bank credit.

6) Consumers have no access to credit.

The monetary circuit begins with the vertical component, when the State describes that which it will accept for payment of taxes. The head tax is payable only in units of that currency. This causes taxpayers to offer goods and services in return for units of the currency. The State is now able to use its currency to purchase goods and services. This process results in the monetization of transactions in the State's currency. Taxpayers are continuously offering goods and services for sale, and soon other private sector agents who desire that which is offered for sale, seek the means of obtaining units of the currency demanded by the sellers. The forces at work in the vertical component are sufficient to cause sellers of goods and services to denominate their offers in units of the State's currency. There follows an exchange in the unit of account from the State to the private sector, and from the private sector to the State, as the State spends and the taxes are paid.

Credit (horizontal activity) arises when a buyer desires to make a purchase by borrowing that which the seller demands. The buyer could borrow directly from the seller. This would result in the transfer of the items sold in exchange for a promissory note of the buyer, denominated in the State's currency, accepted by the seller. This note can be considered a form of money, depending on one's definition of money. The note presumably has value, or the seller would not have accepted it. But clearly any value is subject to change, as the buyer's financial condition may vary. There is also no reason such a note could not be negotiable, and circulate in the economy, as each new holder of the note attempts to use it to purchase from other sellers. Reflux could occur either when the original issuer of the note obtains it back via a sale of goods or services, or when the original issuer of the note retires it by exchanging it for State currency.

Notice that while the note was circulating, it was not an acceptable means of tax payment. The note was, however, an example of the leveraging of the State currency. It was endogenous horizontal activity. The holder of the note had a "long" position and the issuer a "short" position. The net was always 0. The note was, however, denominated in units of the State's currency. Horizontal activity is always denominated in units of a vertical component.

The same transaction could have been intermediated by a bank. Perhaps the seller did not want to accept the note of the buyer, but would accept a bank deposit. The buyer could then go to a bank and request a loan. If approved, the result would be that the bank would hold the buyer's note, and grant the seller a deposit in the bank. Banking thus assumes the credit risk of the buyer (presumably expressed in the interest rate charged). Banks undertaking this type of business activity are similar to insurance institutions, managing risk through analysis and diversity. Again, this is horizontal activity.

Bank deposits are the accounting records of loans. There is gross expansion of financial assets, but the net is always 0. For every deposit there is a loan from which it originated. Do note, however, that as bank deposits are acceptable for tax payment, they may function as part of the vertical component. Again, the banks acting in this capacity are, in the case of deposits being used for tax payment, intermediating vertical activity.

Tax payers not wishing state employment, or who don't qualify for State employment, will seek other, alternative means of obtaining currency. Directly or indirectly the needed funds must, given the above assumptions, ultimately come from someone employed by the State. In the simplest case, individuals offer goods and services to those employed by the state in return for some of the currency originally earned from the State.

Non taxpayers, too, are apt to become monetized, as when they see goods and services for sale they, too, desire units of the State currency of denomination. They may, for example, sell their labor to those employed by the State, and then, with the currency units thus obtained, make purchases from tax payers not employed by the State.

At some point, an entrepreneur may arise and attempt to organize production, with the objective of making a profit, which can then be used to make personal purchases. This may begin by borrowing from a bank to pay the wage bill, and end with the recovery of expenditures and profit through sales of final output. The example of this paragraph is representative of existing circuit analysis. But now we can go further, as even the most complex of the interactions of firms, consumers, taxpayers, and the State are readily examined in the context of our model.

This example assumed a head tax. It could have assumed a transaction tax, such as an income tax. Note, however, that an income tax on income earned by the private sector from State employment will not drive the model. Working for the State, one would simply get a net payment of currency units for which there would be no further use. What would be required is an imputed income tax on transactions within the private sector. These transactions–private sector employment–would then generate a net private sector tax liability that would require sales of goods and services to the State. Note that this would have to include an imputed tax, otherwise the private sector would (continue to) trade in some other medium of exchange.

It is also clear that transactions taxes have the effect of discouraging those transactions subject to the tax. Thus the model lends itself to the analysis of the differences between various asset taxes and transactions taxes.

Fiscal Balance

From inception, the State must spend or otherwise provide that which is necessary to pay taxes. And, for all practical purposes, the private sector will be willing to obtain more currency units from the State in exchange for real goods and services than the minimum required for its current tax liability. The extra currency units accumulated are called net private sector savings of financial assets denominated in the unit of account. I have elsewhere used the term H(nfa) (Mosler, 1997-98). This is analogous to the private sector buying more corn from the farmer than just the exact amount of current consumption.

If the State (or Farmer) does not offer to provide the amount desired by the tax payer (or consumer), there is, by definition, a shortage. Horizontal activity cannot provide for any net accumulation. A collective desire in the private sector can only be resolved in the vertical component. As Moore (1988) argues, only the central bank can resolve a reserve imbalance. In a similar vein, Keynes demonstrated that, except in the unlikely case of an "accident," actual and desired net savings will only be equal at full employment "by design," i.e., the State running a budget deficit (Keynes, 1936, p. 28).

This is not to say that horizontal activity cannot effect a change in the desire to net save. For example, a rise in the price of corn on the futures exchange due to a shortage could certainly reduce the desire to net save corn. The corn market may stabilize at a higher price. Such stability occurs when the actual net savings of corn equals the desired net savings of corn. Likewise, a reduction in State deficit spending could result in a deflation that stabilized when prices fell enough for private sector agents to lower their collective desire to net save, and make purchases either through spending net savings or incurring new debt.

The horizontal component is a leveraging of a vertical component. This implies price sensitivity to supply and demand changes that may originate in the vertical component. Changes in fiscal balance are analogous to changes in the expected harvest or mine output. Changes in taxation are analogous to changes in consumption demand. Fiscal balance occurs only when the State runs a fiscal policy that allows actual H(nfa) to equal desired H(nfa) (Mosler, 1997-98). With most other commodities, the market is allowed to maintain this balance. Price changes are continuous as inventories rise and fall for the various commodities.

The State currency, however, is a case of a single supplier. So we must look to other examples of single suppliers for the more accurate analogy as to the processes that equate actual and desired net savings. An example can be a water monopolist with an unlimited supply and no marginal cost of production. In this case it would be in an area where there is no other available supply, and a sufficiently captive population.

Micro theory recognizes that this single supplier of the needed water would set a price for water and then let the population purchase as much as it desired at that price. A higher price would perhaps lower sales, and a lower price may increase sales, depending on the elasticity of demand. Some of the change in sales would be due to changes in water held in storage facilities, and some due to discretionary consumption, such as bathing. The amount sold and used for drinking, for example, might be less elastic than that sold for washing cars. But in any case, the single supplier of the water would not likely choose an alternative strategy of selling a fixed quantity of water and letting the market decide the price. If it did, it would be a very difficult situation to manage. Depending on elasticity, fixing the quantity a bit too high could cause a large drop in price, and fixing the quantity a bit too low could cause a sharp spike in prices. And, as weather and demand changed, volatility could be high, particularly if desired gallons held in storage facilities were subject to changing hopes and fears. In fact, even if the water monopolist set out to budget the number of gallons it wished to sell, and let the market decide price, it would likely soon change policy. A skyrocketing price would likely result in an increase in the quantity offered for sale, and a falling price might result in a decline in the amount brought to market. So in any case the monopolist would likely end up

behaving as a price setter. Only if and when the single supplier status is lost is the position of price setter eroded.

In the case of the State as single supplier of its currency of issue, the State is in the position of price setter of its currency. It can unilaterally set the terms of exchange that it will offer to those seeking its currency. Ironically, no State currently seems to recognize this. To the contrary, states act as if they were in competition with other buyers when conducting purchases with their own currency. They believe and act as if they must raise revenue through taxing or borrowing to fund spending. They have chosen the option of setting the quantity of their currency they wish to spend via a budgeting process, and then exchanging that currency at market prices for desired goods and services. Like the water monopolist, spending too much will drive up prices (reduce the value of the currency) and spending too little triggers a deflation (increase the value of the currency). In addition, there is no long term "right amount" as the (world wide) desire to net save that currency may be constantly changing. Hence a fluctuating NAIRU, removing most practical value from the concept.

The other practical option for the State, as single supplier of its currency, if it wishes to maintain a market economy, is to administer a buffer stock. Gold has traditionally served this role. The State would set the price at which it would buy or sell gold, and then conduct monetary and fiscal policy such that the buffer stock remained credible. Graham (1937) long ago proposed that commodities other than gold might serve a similar function. In "Full Employment and Price Stability" the option to use labor as the State's buffer stock was presented (Mosler, 1997-98). Clearly, when administering a buffer stock, purchases made at the designated price are not inflationary. They do prevent deflation below that level. Nor are sales from the buffer stock deflationary. Rather, they serve to inhibit inflation.

Deficit Spending and Future Taxation

It has been continuously argued and widely accepted that State deficit spending represents future taxation. Our model, however, clearly demonstrates that this is not the case. For example, if farmers sell more corn than the population will consume that period, they can be said to be deficit spending corn which will sit in the warehouse. Does that imply either that consumption must go up some day, or that future production will be curtailed? Not necessarily. It may be argued that the future value of corn will fall some day, but that would depend on the desired inventory in the future. In fact, corn traders carefully watch the inventories. They have some conception of the "right" size, consistent with stable prices. That "right" amount will naturally fluctuate with population size, availability of substitutes, etc. In the case of the single supplier, like the water monopolist who sets price and lets the market buy all it wants, sales in excess of current consumption again do not necessarily either mean future increases in consumption or lower future output. Nor do they necessarily mean a fall in future water prices.

The same is true for the State as issuer of its currency. The State does not force anyone to exchange goods and services for its currency. The exchange is with willing sellers who desire the currency. Deficit spending occurs only if the private sector is desirous of accumulating units of the currency in order to net save. Hyperinflation is the condition in which the private sector no longer desires the currency unit (as reflected in the price level).

The Asian Crisis of 1997

The Asian crisis of 1997 can be analyzed in the general commodity framework presented here. What happened can be described as a dollar squeeze. In the face of declining $US federal budget deficits, horizontal expansion in Asia continued through the first half of 1997. Agents borrowed $US and either spent them directly on projects or used their $US to purchase local currency to run their businesses. That meant they were short the $US and long their local currency, which was generally invested in local enterprise. Often it was the local central bank that encouraged this type of risk taking by setting the domestic interest rate higher than the $US rate and simultaneously maintaining a pegged exchange rate. While the local businessmen were borrowing $US and exchanging them for local currency, the central bank was more than willing to accommodate them, and accumulate $US reserves. However, when the private sector turned to being net sellers of the local currency to pay their $US obligations the central banks were reluctant to lose their $US reserves to support the local currency and instead let it float downward. At the lower foreign exchange rates the local businesses were unable to meet their $US obligations and a liquidity crisis, which is still not resolved, followed.

Continuing with our commodity framework, it was similar to being short corn while the warehouse stocks were declining. Now, with depressed local currencies, many of these countries are running sizeable $US trade surpluses. That means someone else is running $US deficits, as the horizontal component between nations always nets to 0. As long as US fiscal balance remains as it is, there is little that can be done to alleviate the world wide $US squeeze, except a decrease in the net desire to save $US denominated assets. Falling prices may decrease the net desire to save, inducing the additional spending, but it is not common for this to happen. In fact, it is hard to find a sector of the US economy that can continue to increase its indebtedness sufficiently to extend US GDP growth. The two large growth areas were the expansion of sub prime and Asian credit, both of which are slowing dramatically. Furthermore, it seems all nations are pushing (fiscal) deficit reduction at the same time, taking away the possibility of export led expansions.

I have yet to read any mention of US fiscal policy as a cause for concern and a contributing culprit in the Asian crisis. No one seems to recognize the importance of deficits in the same way they recognize the importance of the size of the stocks of other commodities. That may be why markets don't react in anticipation of the inevitable short squeeze, as none of the market participants are aware of the connection. Therefore, only after the shortage is acute does the market finally react, as shorts have no choice but to cover their positions by selling other assets to obtain needed $US. So it hits hard and fast. Note that the Japanese economy expanded rapidly enough in the late 1980s to drive the budget into surplus. Soon after, the stock market and real estate market crashed as agents were forced to sell these assets to obtain needed yen. Eight years later the stock market is still more than 60% off its highs and real estate continues to drop at double digit rates annually, in spite of years of near 0% interest rates. A yen short squeeze can only be resolved in the vertical component. And long term budget targets conflict with that necessity.

Conclusion

This paper outlines an alternative way of viewing the monetary circuit that takes into consideration the central role of the State from the beginning of the

analysis. Vertical and horizontal components of the monetary circuit were introduced and their relation analyzed. It was shown that this framework is applicable not only to currency, but to any commodity. This is because, while currency does not obtain its value by virtue of its status as a commodity, once endowed with value a tax driven currency can be analyzed like any other commodity. In addition to debunking the myth that deficits imply future taxation, it was also shown that such a framework is highly applicable to the current Asian financial crisis.

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