14

Money

Money ranks with the wheel and fire as ancient inventions without which the modern world could not function. Probably more people today are "run over and burned" by out-of-control money than by out-of-control wheels and fires. Money is mysterious. Unlike matter and energy, it *can* be created and destroyed, evading the laws of thermodynamics. Private citizens (counterfeiters) are sent to jail for making even small amounts of it, yet private commercial banks make almost all of it, and we pay them for it! Sometimes money is a costly commodity (gold) and sometimes a costless token (paper notes). It is easily transferable into real assets by individuals, but the community as a whole cannot exchange its money into real assets at all, since someone in the community ends up holding the money. Some economists think the money supply should be determined by fixed rules, others think it should be manipulated by public authorities. And some people think the love of money is the root of all evil! Anyone who is not confused by money probably hasn't thought about it very much.

Money functions as a medium of exchange, a unit of account, and a store of value. The functions are interrelated but worth considering separately. To measure exchange value, we need a unit—call it a dollar, a peso, a franc, or a yen. If the unit is stable over time (no inflation or deflation), then money automatically serves as a store of exchange value. To function as a medium of exchange and let us escape the inconvenience of barter, money must hold its value at least long enough to effect both sides of the transaction, which in barter, of course, are simultaneous. A moment's reflection shows how tremendously inefficient barter is, and consequently how efficient money is. In barter there must be a coincidence of wants— it is not enough that I want what you have to trade; you also have to want whatever it is that I have to trade, and we have to find each other. Money

provides a common denominator that everyone wants simply because everyone else is willing to accept it. It is a standard, well-defined commodity (or later a token) that breaks the two sides of a difficult barter arrangement into two separate and easy transactions.

Karl Marx analyzed transactions as follows. First we have simple barter, which he denoted as:

$$C\text{—}C^*$$

Commodity C is exchanged for commodity C*. You have C and prefer C*; I have C* and prefer C. We are both better off after the transaction. We both increase the use value of what we own. Exchange value is not separated from use value. No money is needed, but we were lucky to have found each other.

Next for Marx comes "simple commodity production":

$$C\text{—}M\text{—}C^*$$

Now we have money functioning as a medium of exchange. Exchange value, the sum of money, M, is entirely instrumental to bringing about an increase in use values by facilitating the exchange. The process begins and ends with commodity use values. The goal is to increase use value, not exchange value.

For Marx the critical change comes in the historical shift from simple commodity production to "capitalist circulation," which he symbolized as:

$$M\text{—}C\text{—}M^*$$

The capitalist starts with a sum of money capital, M, uses it to make commodity C, and then sells C for the amount M*, presumably greater than M. Thus:

$$M^*\text{—}M = \Delta M$$

ΔM is profit, or surplus value in Marxist terms. For us the important thing is not Marx's notion of surplus value, which is tied up with his very problematic labor theory of value, but the simple observation that in moving from C—M—C* to M—C—M* the driving motive has shifted from increasing use value to increasing exchange value.

Use value arises from the actual use of commodities, it is concrete and physically embodied. **Exchange value** is abstract and inheres in money. It has no necessary physical embodiment.[1] Real wealth—commodities—obey the laws of thermodynamics. Money, a mere symbolic unit of account, can be created out of nothing and destroyed into nothing. There is a physical limit to the accumulation of use values. There is no obvious

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[1]Though, of course, exchange value is only real if something exists for which money can actually be exchanged.

limit to the accumulation of exchange value. Fifty hammers are not much better than two (one and a spare) as far as use values are concerned. But in terms of exchange value, fifty hammers are much better than two, and better yet in the form of fifty hammers' worth of fungible money that can be spent on anything, anywhere, and at any time.

Box 14-1   Diamonds-Water Paradox

The distinction between use value and exchange value goes back to Aristotle and was used to "resolve" the "diamonds-water paradox"—the paradox that although water is a necessity it has a low price, while diamonds are practically useless but have a high price. Economists dealt with this conundrum by declaring that there are two basic kinds of value, use value and exchange value, and one has nothing to do with the other. In the late 1800s the marginalist revolution in economic thinking resolved the paradox as follows: Exchange value is determined by marginal utility and use value is determined by total utility; that is, exchange value equals marginal use value. Water has enormous total utility, but it is so plentiful that at the margin we use it for trivial satisfactions. This marginal utility determines exchange value. How do we know that? If you want to buy a gallon of water from me, what determines how much you will have to give me in exchange? If I give you a gallon of water, I won't stop drinking and go thirsty, nor will I stop bathing and be dirty. I'll probably water my petunias less often. The petunias are my least important use value, my marginal utility of water, my opportunity cost for a gallon of water. Since the *marginal* utility of water is what I will sacrifice by trading away a gallon, that's what determines the exchange value of water. Exchange value is determined by the least important use value, the value sacrificed. Water is abundant so its marginal utility is very small; diamonds are scarce, so their marginal utility is still high.

A hoard of hammers takes up space and is subject to rust, termites, fire, and theft. Fifty hammers' worth of money is not subject to rust, rot, and entropy, and far from costing a storage fee will earn interest from whomever gains the privilege of "storing" it for you. Production for use value is self-limiting. Production for the sake of exchange value is not self-limiting. Since there is no limit to the accumulation of abstract exchange value, and since abstract exchange value is convertible into concrete use value, we seem to have concluded that there must not be any limit to concrete use values either. This has perhaps led to the notion that exponential growth, the law of money growing in the bank at compound interest, is also the law of growth of the real, or material, economy.

■ Virtual Wealth

Frederick Soddy summarized all this by carefully distinguishing wealth from debt.[2] He noted that "a weight, although it is measured by what it will pull up, is nevertheless a pull down. The whole idea of balancing one thing against another in order to measure its quantity involves equating the quantity measured against an equal and opposite quantity. Wealth is the positive quantity to be measured and money as the claim to wealth is a debt" (p. 103).[3] Monetary debt, the measure of wealth, is negative wealth, say minus two pigs. It obeys the laws of mathematics, but not of physics. Wealth, on the other hand, plus two pigs, obeys the laws of thermodynamics as well as mathematics. Positive pigs die, have to be fed, and cannot reproduce faster than their gestation period allows. Negative pigs are hyper-fecund and can multiply mathematically without limit. As Soddy put it, "you cannot permanently pit an absurd human convention, such as the spontaneous increment of debt (compound interest), against the natural law of the spontaneous decrement of wealth (entropy)" (p. 30).

The holding of token money by the public to avoid the inconvenience of barter gives rise to the curious phenomenon that Soddy called **virtual wealth**, which he defined as the aggregate value of the real assets that the community voluntarily abstains from holding in order to hold money instead. Individuals can always convert their money holdings into real assets, but they choose not to in order to avoid the inconvenience of barter. This raises the question of whether money should be counted as a part of the real wealth of the community? Yes, if money is a commodity like gold that circulates at its commodity value. No, if it is token money like a dollar bill whose commodity value is nil but whose exchange value is significant. Even though each person can at an instant convert his money into real assets, it is impossible for the community as a whole to do this, as we have previously noted.

Money, therefore, represents not real wealth but, in Soddy's term, "virtual wealth." More exactly, it is the magnitude of virtual wealth that determines the value of money. What happens if the government puts into circulation more money than people currently want to hold? People will exchange money for real assets and drive up the price of real assets. As the price of real assets rises, the real value of money falls until it again coincides with the virtual wealth of the community. If there is too little money, people will exchange real assets for money, thereby

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[2]F. Soddy, *Wealth, Virtual Wealth, and Debt*, London: George Allen & Unwin, 1926.

[3]When banks create money by providing someone with a loan (see below), they actually create a debt as the first step. On the assets side of the accounting books, the banker enters a debt for the amount of money borrowed (to be paid off with interest). This borrowed money is then placed in a bank account, which is listed in the bank's books as a liability.

driving down the price of real assets. As the price of real assets fall, the value of money increases until it again equals the virtual wealth of the community. The value of a dollar, then, is the virtual wealth of the community divided by however many dollars are in circulation. It follows that the value of a unit of token money is not determined by the total wealth of a community, nor by its annual GNP, but by its virtual wealth relative to the money supply.

Box 14-2 | **VIRTUAL WEALTH AND FIDUCIARY ISSUE**

Nobel laureate economist James Tobin comes very close to Soddy's concept of virtual wealth in his explanation of the "fiduciary issue":

The community's wealth now has two components: the real goods accumulated through past real investment and fiduciary or paper "goods" manufactured by the government from thin air. Of course, the nonhuman wealth of such a nation "really" consists only of its tangible capital. But as viewed by the inhabitants of the nation individually, wealth exceeds the tangible capital stock by the size of what we might term the fiduciary issue. This is an illusion, but only one of the many fallacies of composition which are basic to any economy or society. The illusion can be maintained unimpaired as long as society does not actually try to convert all its paper wealth into goods."[a]

[a]J. Tobin, "Money and Economic Growth," Econometrica (October 1965), p. 676.

■ SEIGNIORAGE

Who owns the virtual wealth? Since it does not really exist, we might say that no one owns it. It is a collective illusion. Yet individuals voluntarily hold money instead of real assets, and they behave as if money were a real part of their individual wealth, even if they understand that collectively it is only "virtual" or illusory. Every member of the community who holds money had to give up a real asset to get it—except for the issuer of money. The one who creates the money and is the first to spend it gets a real asset in exchange for a paper token. The difference between the monetary value and the negligible commodity value of the token, the profit to the issuer of money, was and still is called **seigniorage**, in recognition of the lordly nature of this privilege. Who is this fortunate person? Historically it was the feudal lord, or the king, the sovereign, who issued money within his domain. One might expect that this privilege would have been passed on to the sovereign's legitimate heir, the democratic state. To some extent this is the case, because only governments can issue currency or legal tender. However, over 90% of our money supply today is not currency but demand deposits created by the private commercial banking

system.[4] They are created out of nothing and loaned into existence by the private commercial banks under rules set up by the government. Who gets the seigniorage? Seigniorage from currency goes to the government. Seigniorage from demand deposits goes to the private sector, initially to commercial banks. To the extent there is competition among banks for savings, they will redistribute some of the seigniorage to depositors. Sectors of society too poor to save will receive nothing.

What does money consist of in our economy? A further mystery of money is that it has several definitions. The most restrictive is "currency plus demand deposits in the hands of the nonbank public." More expansive definitions include savings deposits and even credit card debt. Most of our money supply bears interest as a condition of its existence. Whoever borrowed it into existence must pay back what he borrowed plus interest. Thus, a requirement for growth (or else inflation) is built into the very existence of our money supply. Moreover, the money supply, *ceteris paribus*, expands during boom times when everyone wants to borrow and invest, and contracts during recessions when loans are foreclosed, thereby aggravating cyclical instabilities.

On learning for the first time that private banks create money out of nothing and lend it at interest, many people find it hard to believe. Indeed, according to Joseph Schumpeter, as late as the 1920s, 99 out of 100 economists believed that banks could no more create money than cloakrooms could create coats. Yet now every economics textbook explains how banks create money. We will explain how it works in a minute, but first we'll let the strangeness of it sink in. Of course, this is not the only way to create money. Nonetheless, most economists today accept this situation as normal. But the leading economists of the early part of the twentieth century, Irving Fisher and Frank Knight, thought it was an abomination. And so did Frederick Soddy.

Box 14-3	**LOCAL CURRENCIES AND LOCAL EXCHANGE TRADING SYSTEMS**

Currencies are created not exclusively by governments. A variety of nongovernment legal currencies exist in countries throughout the world, and a closer look at local currencies can provide important insights into money. There are three ways to design a currency system. Most national currencies are created by fiat. There is nothing to back up fiat money but faith that someone else will accept it in exchange for goods ("in God we Trust"

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[4]Demand deposits are ordinary checking accounts from which money is payable "on demand" to the bearer of your check.

or as the Ithaca HOUR says "in Ithaca we trust"). Second, a currency can be valued in terms of a commodity, and may or may not be redeemable in terms of that commodity. For example, the Constant, one of the earliest alternative currencies and a forerunner of today's local currencies, was introduced in the 1970s on an experimental basis in Exeter, New Hampshire. The Constant was designed to maintain a constant value against a basket of 30 different commodities. Finally, a currency can be backed by a commodity, which means it can freely be exchanged for that commodity. Such was the case for U.S. currency in the nineteenth century when money holders could theoretically exchange gold-backed dollars for gold at any time, and the necessary gold reserves were physically available to do this.[a]

The city of Ithaca, New York, has one of the best-developed local currency systems in the world. The currency is known as Ithaca HOURS. An individual can participate in the HOURS system simply by agreeing to accept HOURS in exchange for the goods or services she produces. New money must be issued to chase this greater supply of goods and services. Where does this new money come from?

Published backers of the HOUR directory, which is considered a service provided to Ithaca HOURS, are paid 2 HOURS (the equivalent of approximately $20 US) on first participation and again when they renew their commitment. Technically speaking, the participant is being paid for publicly backing HOURS, but one could also say that in the HOURS system, the person who agrees to generate new goods and services earns the right to seigniorage. While at first glance it may seem strange that one would be entitled to money for simply agreeing to accept money, new money must clearly come from somewhere, and it's reasonable for part of it to go to the person responsible for creating the new wealth.

Theoretically, the amount of new money created times the velocity with which the money circulates should equal the amount of new goods and services being offered. So far it seems that new participants have on average offered more than enough goods and services to use up their 2 new HOURS. Several mechanisms are used to increase the money supply and prevent deflation. Residents of Ithaca may request interest-free loans of HOURS, organizations may request grants of HOURS, employees of member businesses can accept HOURS as a regular part of their pay, and people may purchase hours into circulation with dollars, from the HOUR bank. Additional money is created to finance administrative costs of the system. The circulation committee of Ithaca HOURS is responsible for deciding how many HOURS to create. So far, Ithaca HOURS are holding their own against the U.S. dollar, and they continue to trade at a ratio of 1 HOUR to 10 U.S. dollars.[b]

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[a]*R. Swann and S. Witt, Local Currencies: Catalysts for Sustainable Regional Economies. Revised 1988 Schumacher lecture, 1995/2001. Online: http://www.schumachersociety. org/currencypiece.html (E. F. Schumacher Society).*

[b]*See also http://www.ithacahours.com. Paul Glover, the founder of Ithaca HOURS, was also very helpful in providing information.*

■ THE FRACTIONAL RESERVE SYSTEM

What allows banks to create money is our fractional reserve system. If banks had to keep 100% reserves against the demand deposits they create, then there would be no creation of money. Hence, the reform called for by Soddy, Fisher, Knight, and others was for a 100% reserve requirement. Banks would still provide the convenience of checks and safekeeping, and they would charge for these services. They could still lend other people's money for them and make a profit. But they could not create money any longer.

Exactly how does the fractional reserve system enable banks to create money? Suppose the law required banks to keep 10% reserves against their demand deposits (actually, it is much less). Reserves are either cash or deposits with the Federal Reserve Bank owned by the commercial bank. The bank needs reserves only to settle the difference between daily deposits and withdrawals, which nearly always balance to within a few percent. Therefore, the bank feels that keeping 100% reserves is excessively cautious. It can keep only 10% reserves and meet all imbalances that are statistically likely to ever happen. The "excess reserves" can be loaned at interest, thereby increasing the bank's profits. The government has concurred in this practice and made it legal; it is known as **fractional reserve banking**. It works as long as all depositors do not demand their money at once, as happens in a bank panic (when depositors doubt the solvency of the bank and all rush to get their money out at the same time). To avoid panics, the government set up the Federal Deposit Insurance Corporation (FDIC). If depositors are insured against loss when a bank fails, then they will be less likely to panic and cause the very failure they feared. (They will also be less likely to demand prudence from their bank, but that's another story we leave for later.)

How do banks actually create money? Let's first consider a monopoly commercial bank. Because it is the only bank, it knows that any check drawn against it in one branch will be deposited with it in another branch. When it clears its own check, there is no transfer of money, of reserves, to another bank. Therefore, if it has a new cash deposit of $100 that counts as reserves, and the reserve requirement is 10%, it can lend out in newly created demand deposits an amount of $900. People and businesses borrow only what they intend to spend, so it is certain that this $900 will be spent. Its total additional demand deposits are $100 in exchange for the new cash deposit, plus $900 new loans, giving $1000 in new demand deposits backed by $100 in new reserves, thus satisfying the 10% reserve requirement. Net addition to the money supply is $900 worth of demand deposits.

Now let's consider a competitive banking system rather than a single

monopoly bank. Suppose Bank A receives a new cash deposit of $100. Unlike the monopoly bank, Bank A cannot lend out $900 because nearly all of the checks written on that amount of new demand deposits will be deposited in other banks, not Bank A. Clearing will necessitate a transfer of reserves to other banks. If it had lent out $900, it would surely soon have to transfer almost that amount to other banks. But it only has $100 in new reserves and thus will not be able to meet its legal reserve requirement of 10%.

So how much can Bank A lend as a result of a new cash deposit of $100? If it safely assumes that all checks drawn on its loans will be deposited in other banks, it can only lend out $90. Therefore, it still creates money—$90 in new demand deposits above the $100 demand deposit in exchange for the $100 cash. But the process does not stop here. The $90 of excess reserves safely lent by Bank A end up being transferred to Bank B, which can now safely lend 90% of that, or 0.9 ($90) = $81. So now the money supply has gone up by $90 + $81 = $171. But then the new $81 excess reserves of Bank B get transferred to Bank C, which can create new deposits of 0.9 ($81) = $72.90. And the process continues in an infinite series, the sum of which turns out to be—can you guess it? Exactly $900 of new money, as with the monopoly bank, or $1000 of new demand deposits, remembering the exchange of $100 cash for a $100 demand deposit that started the whole process.[5] The whole process works in reverse when someone withdraws cash (reserves) from the bank. The net result of simultaneous processes of money creation and destruction determines the net growth of the money supply.

■ MONEY AS A PUBLIC GOOD

Money is a collective phenomenon, not a privately owned resource. In a peculiar but very real way, money is a true public good. You might think that if you own money, you can exclude others from using it, but if you did so completely, your money would have no value whatsoever. Money only has value if everyone can use it. And money is certainly nonrival, in that my spending a dollar in no way decreases the value of that dollar for the next person. Since money is a public good, one would expect seigniorage to be public revenue, not private. The virtual wealth of the community could be treated as a publicly owned resource, like the atmosphere or electromagnetic spectrum. But that is not the case. The money supply is privately loaned into existence at interest. The fact that most of our money

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[5]If r is the required reserve ratio, then the demand deposit multiplier is this infinite series:

$$1 + (1 - r) + (1 - r)^2 + (1 - r)^3 \, ... + (1 - r)^n = 1/r$$

was loaned into existence and must be paid back at interest imparts a strong growth bias, as well as cyclical instability, to our economy. There is no economic reason why the monetary system must be linked with the private commercial activity of lending and borrowing.

What are the alternatives? Soddy offered three reforms. His first proposal was to gradually raise the reserve requirement to 100%. That would put the private banks out of the money creation business and back into the business of borrowing and lending other people's real money, providing checking services, and so on. Control of the money supply would then belong to the government. How, then, would the government regulate the money supply? Soddy's second policy suggested an automatic rule, based on a price level index. If the price level index is falling, the government should finance its own activities by simply printing new money and spending it into existence. If the price level is rising, the government should cease printing money and tax more than it spends, that is, run a surplus. This would suffice for a closed economy, but for an open economy, one that engages in international trade, the domestic money supply can be increased or decreased by international payments balances. Soddy's third proposal (back in 1926, under the gold standard) was freely fluctuating exchange rates. Currencies would trade freely and directly against each other; an equilibrium exchange rate would eliminate any surplus or shortage (deficit) in the balance of payments, and consequently any international effect on the domestic money supply. Remember our discussion of surplus and shortage in Chapter 9.

Of course, this is not what we have now.

The gold standard has been abandoned, and fixed exchange rate regimes have given way to flexible exchange rates, but not to freely floating exchange rates, which are thought (rightly or wrongly) to be too volatile and disruptive of international trade. (We return to the topic of exchange rates in Chapter 19.) The money supply is largely determined by the commercial banking system, subject to some manipulation, but not control, by the Federal Reserve (the Fed). The **Federal Reserve System** is a coordinated system of district central banks in the U.S. that influences interest rates and money supply.

The Federal Reserve has three tools for manipulating the money supply. First, the Fed can set the reserve requirements, within limits prescribed by law, and thus reduce or expand the supply of money created by banks, as explained above. This tool is used infrequently, because it has large impacts on the financial sector. Second, the Fed can change the interest rate it charges to lend reserves to the commercial banks (known as the discount rate), thus making it more or less profitable for the commercial banks to lend to their customers, and in doing so expand (or limit the expansion of) the money supply. Third, the Fed can conduct open market

operations, directly increasing or decreasing the money supply by buying and selling government securities in the open market. When the Fed buys government securities, it does so by crediting the bank account (at Reserve Banks) of securities dealers. This directly increases the available supply of money by the amount of the purchase. The deposit also increases the bank's reserves, allowing the bank to make more loans and create even more money. When the Fed sells government securities, the money supply contracts.

■ MONEY AND THERMODYNAMICS

Frederick Soddy was a Nobel Prize winner in chemistry, and a great believer that science should be used to benefit humankind. He doubted that this would happen, however, and even predicted back in 1926 the development of the atomic bomb. Why are the fruits of science often badly used? Because, thought Soddy, we have a flawed and irrational economic system. Unless we reform that system, scientific progress will serve to help us destroy the world faster. Soddy spent the second half of his 80-year life studying the economic system. He understood thermodynamics and entropy and the biophysical basis of economics, and forcefully called attention to this interdependence. But he focused his attention mainly on money. Why? Because money was the one thing that did not obey the laws of thermodynamics; it could be created and destroyed. And yet this undisciplined, imaginary magnitude was used as a symbol and counter for real wealth, which has an irreducible physical dimension, and cannot be created or annihilated. Money is the problem precisely because it leads us to think that wealth behaves like its symbol, money; that because it is possible for a few people to live on interest, it is possible for all to do so; that's because money can be used to buy land and land can yield a permanent revenue, therefore money can yield a permanent revenue.

Because of this fallacy, M. King Hubbert recently had to remind us that **exponential growth**—growth at a constant percentage rate—is a transient phase in human history.[6] The classic example of the power of exponential growth is the story about putting a grain of wheat on the first square of a chessboard, two grains on the second, four on the third, and so on. At the next-to-last, or 63rd, square the board contains 2^{63} grains of wheat, far more than the world's whole wheat crop, and the last, or 64th, square will by itself contain that much again. Hubbert's conclusion was that the world cannot sustain 64 doublings of even a grain of wheat. In our world, many populations are simultaneously doubling—populations

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[6]M. King Hubbert, "Exponential Growth as a Transient Phenomenon in Human History," in H. Daly and K. Townsend, eds., *Valuing the Earth*, MIT Press, Cambridge, MA, 1993.

of people, livestock, cars, houses—things much bigger than a grain of wheat. How many times can each of these populations double? How many times can they all double together? A few tens at most, was Hubbert's answer. Our financial conventions, on the other hand, assume that this doubling will go on forever.

This expectation gets played out in reverse when we discount future values to an equivalent present value. We simply run the exponential calculation backward, asking: How much would we have to deposit in the bank today at today's interest (discount) rate in order to have the given future amount at a given future date? This discounting procedure is, as we have seen, at the heart of the financial model of present value maximization, which has displaced the more traditional economic model of profit maximization. The error that bothered Soddy is deeply ingrained in present economic thinking. We have already encountered it in our discussion of why renewable resources are driven to extinction.

It is convenient to dismiss Soddy as a "monetary crank" and to remark what a pity it was that such a brilliant chemist wasted so much of his time on a topic that he was unqualified to think about! This is exactly the treatment that Soddy was given. It was harder to dismiss Irving Fisher and Frank Knight, who also called for 100% reserve requirements, because they were the leading economists of their generation. But their ideas on money were simply classed separately from the rest of their economics, treated as a peccadillo, and were ignored.

Our previous statement—that money does not obey the laws of thermodynamics—needs some qualification. Exchange value is hardly a value if there is nothing for which it can be exchanged. If money is issued without real wealth to back it up, spending that money simply drives up the prices of goods and services, causing inflation, and bringing "real money" back closer into line with real wealth (more on inflation later).

What about virtual wealth? Are there limits to the amount of real wealth people are willing to forego in order to hold money? If not, then the amount of real money in circulation can continue to grow independently of the production of real goods and services. Financial assets are neither money nor real wealth, but they are bought and sold in the market, and people will hold more money to be able to meet their demand for transactions in these assets. In addition, people trade in money itself, using one national currency to buy another, and this similarly increases the demand for money. Both currency speculation and growth in financial assets have increased dramatically in recent years.

The M—C—M* equation previously showed how money has become less a means for facilitating exchange, more an end in itself. In reality, the M—C—M* equation has itself been dwarfed by pure currency speculation and trading in financial paper. John Maynard Keynes warned back in

the 1930s:[7] "Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done." While global production of marketed goods and services is roughly on the order of $30 trillion per year,[8] the trade in paper purchasing paper (or, more accurately these days, electrons purchasing electrons) with no intervening commodity is almost $2 trillion *per day*.[9] This means that the buying and selling of paper assets and currencies, M—M*, is more than 20 times greater than exchanges in the real economy! Real enterprise has indeed become a bubble on the whirlpool of speculation. As no productive activity intervenes in these speculative purchases, the sole result seems to be a magical growth in money. But is such growth actually possible indefinitely?

Growth in money is meaningless unless there is a corresponding increase in real wealth, so now we must ask: Does financial speculation lead to growth in real wealth? Some paper-paper purchases are purchases of new stock offerings that do provide financial capital, which can mobilize physical factors of production, but this is only an estimated 4% of stock purchases. Speculation in currency, in which millions of dollars are traded back and forth for very small margins over short time scales, clearly produce nothing. Indeed, such transactions almost certainly contributed to the crises in several South East Asian economies in 1997–1998 as speculators sold off regional currencies, and these crises meant dramatic *decreases* in production from those economies. Yet such speculation would not be undertaken unless some profits were being made somewhere. For example, George Soros, who participated in the financial speculation in South East Asia, is reported to have earned 1 billion pounds speculating on England's currency in 1995.[10] The only possible explanation is that if those who produce nothing are earning, through speculation, more money that entitles them to more real wealth, then those who actually do produce something must be becoming entitled to increasingly less wealth.

In summary, it would appear that the illusion that money can grow without physical limits results from three things. First, as long as the

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[7]J. M. Keynes, *The General Theory of Employment, Interest and Money*. Orlando, FL: Harcourt Brace, 1991, p. 159.

[8]Official estimates based on purchasing power parity (PPP) are on the order of $40 trillion per year; the numbers for speculation are in nominal dollars, not PPP.

[9]D. Korten, *The Post-Corporate World: Life After Capitalism*, San Francisco: Berrett-Koehler, 1998.

[10]W. Greider, *One World, Ready of Not: The Manic Logic of Global Capitalism*, New York: Simon & Schuster, 1997.

production of real goods and services increases, more money is required to pursue them, so growth in money is justified. But such growth cannot, of course, continue forever on a finite planet. Second, as the number or price of financial assets grows, such as through speculative bubbles, then demand for money grows as well, and supply can increase to meet this demand. The fact is, however, that financial bubbles inevitably burst. Third, holders of financial capital see their capital grow because speculation can serve to transfer resources from those who produce to those who merely speculate. Such transfer of wealth has limits, though the limits are obscured by continued economic growth. Thus, the appearance that money is exempt from the laws of thermodynamics is an illusion that can only be maintained while scale is increasing, or the financial sector is expanding relative to the real sector. It remains impossible for real money to grow without limit.

THINK ABOUT IT!

What do you think would happen if a national government tried the same approach to seigniorage as Ithaca HOURS? For example, the government could impose 100% reserve requirements to prevent banks from creating money, award every new entrant to the economy some lump sum of money (perhaps by providing 18-year-olds sufficient money to pay for a college education or start a business), and lend money into existence at 0% interest for socially desirable projects.

BIG IDEAS to remember

- Money as: medium of exchange, unit of account, store of value
- Barter; simply commodity production; capitalist circulation
- Exchange value vs. use value
- Virtual wealth
- Seigniorage
- Fractional reserve banking
- Money creation
- Money as public good
- Federal Reserve System
- Money and laws of thermodynamics
- Local currencies