Money hypothesis 1; why our current money system is unstable

by Paul Grignon, the creator of the *Money as Debt Trilogy* animated movies.

Abstract

In this paper I will demonstrate with simple arithmetic why the current global money system is only stable when the supply of money is growing. Whenever the supply of new money slows down, borrowers lose their homes, markets tumble, banks drown in red ink and the taxpayers have to ride to the rescue with "bailouts". While many economists admit economics has failed, popular money reformers crusade against "impossible" interest, while others can only imagine a return to gold. The argument presented in this paper is that the root problem is neither interest, nor debt. It is the primitive "coin" concept of money, money as a "thing-in-itself" made valuable by its scarcity. I contend that this concept of money has become lethally dysfunctional in our current credit-dependent system. The needed change I will describe briefly, to be expanded upon in a separate paper, *Money hypothesis 2; a different concept of money.*

The hypothesis

It is my hypothesis that the root cause of mathematical instability in our monetary system is that money is a thing-in-itself that is simultaneously lent more than once. The minimum case is that it has been lent twice. Simply put, if the same dollar is owed to two or more lenders, it is impossible to pay off all debts. It is however, possible to avoid default by means of *perpetual debt*, but only by borrowing from Peter to pay Paul and vice versa *forever*. In a perpetual debt, each debt is payable only in money and is, therefore, dependent on the other debt(s) for the supply of money. By simple logic, it then follows that the supply of loan money from any of the lenders cannot be reduced or even slow down without forcing mathematically inevitable default of all the loans mutually dependent on that same principal.

The root of the growth imperative

Following this logic further, perpetual debt would be like a ratchet that allows movement in only one direction. Every increase in the supply of debt-money would have to be

permanent, and thus a bias for constant growth would be locked in. This perpetual debt model provides a plausible explanation why we observe, in the real world, a relentless and ultimately self-defeating structural requirement for money growth accompanied by frequent disastrous debt crises in which borrowers lose their collateral when the stock of money shrinks. (1) Given its enormous destructive potential, one would expect the perpetual debt dynamic to be recognized by economists and measured. One would be wrong. In 14 years of reading articles and books on monetary theory and economics, not once have I encountered any recognition of the perpetual debt dynamic, much less any exploration of this subject by anyone other than myself.

In my analysis, the root of the problem is what I call the "coin model" of money, money that is a thing-in-itself in limited supply. If money were gold coins for example, gold coins could still be lent twice creating perpetual debt. The significant difference is that, in the real world, gold coins are not necessarily debt to start with. Gold coins would first have to concentrate into the hands of moneylenders before any significant part of the money supply would enter circulation as debt. Today, almost all of our money is created as debt to a bank and is inevitably lent twice by the design of the banking system itself.

What money is now

Today's money is composed of two components: legal tender (base money) created by the nation's central bank, and promises of legal tender on demand created by commercial banks. Promises of legal tender far exceed the supply of legal tender. (2) (3) Legal tender is government authorized paper cash and coin. (4) Coins are minted by the government, sold to banks at face value and debt-free, but coins are a negligible part of the money supply. Most legal tender is paper cash and credit for paper cash at the nation's central bank. If you are offered (tendered) legal tender in payment of a money debt, the courts consider that you have been paid whether or not you accept it. (5) Legal tender is accepted in payment of taxes.

Legal tender in the form of paper cash is created by the central bank of the nation for the cost of printing it. Whenever the central bank decides to increase the supply of legal

tender in circulation, it buys national government bonds, i.e. national taxpayer debt, with its newly created legal tender. (6) (7) In exceptional times of "quantitative easing" the central bank may create legal tender to buy private debt such as corporate bonds and mortgage-backed securities. (8) Therefore, our national paper cash is created as a debt-of-itself to the central bank. This is debt on which national governments roll over the debt and pay only the interest as the amount of base money constantly increases. (9) How is the interest paid? The national government can pay this interest from taxes collected or by selling more bonds and getting deeper in debt. (10) The central bank pays for its operations from the interest the government pays and other incomes, and returns the excess revenue to the government. (11) It is little wonder that most people don't try to understand the money system, when confronted with this level of convolution.

Only deposit banks can maintain balances in legal tender at the central bank. These credits for paper cash on demand are one means by which banks can settle accounts with each other. (12) When a bailout occurs, the taxpayer is put further in debt to create new legal tender which is added to the credit for paper cash on demand of commercial banks at the central bank. In this way, the bailout makes up for red ink on the commercial banks' balance sheets, settles accounts between banks, and prepares the banking system as a whole for a massive cash withdrawal by depositors, a "run on the banks". In the absence of a bank run that would put paper cash into circulation, the way most money comes into circulation is when someone takes a so-called *loan* from a commercial bank.

How is money created?

Most of our so-called money is not physical paper cash and coin. (2) It is numbers on a commercial bank's computer screen or special piece of paper that tell how much legal tender the depositor *may* demand from the bank. The truth of this is our own experience. "Money" is either credit for legal tender at a bank or legal tender. We can't demand anything else. Bank credit for legal tender on demand accounts for about 95% of the functional money in developed countries with convenient non-cash payment options. Where does this vast amount of bank account money come from? The answer is simple. Bank loans create new money as promises of legal tender that the banks don't have, and

don't need; because, predominantly, we use the bank promises of legal tender for our transactions instead of the legal tender itself. It is credit *measured* in money. (6)

Here is an example of how money is created. A borrower signs a loan document that promises a bank $100,000 in legal tender on demand, plus interest over time. Adding interest means that the borrower will ultimately pay more than $100,000. However, when the loan document is signed, no time has elapsed. Therefore, the current value of this promise is just $100,000. The bank balances this offering from the borrower by creating, on its books, its own promise of legal tender on demand now, a bank account for the so-called borrower, spendable bank credit of $100,000. The one promise creates the other. The borrower commits to future earning and the bank makes the borrower's credit acceptable to society by trusting the borrower to create value for society (work) in exchange for money, and extinguish the credit over time. At its own risk, the bank makes the borrower's credit spendable in the marketplace as a liability against the bank.

If the newly created $100,000 of bank credit is spent, and the seller deposits it back into the same bank that it came from, no money is required of the bank. The $100,000 promise the bank created just moved from one account to another. If the $100,000 is deposited in a different bank, the bank that created it will owe the other bank $100,000. However, the other banks create money this way too, and therefore, as long as each gets its fair share of the new credit returned as deposits, most of their debts to each other cancel out to zero. In the real world, there is competition for deposits between rival banks, but system wide, for our purposes, it is valid to assume that the banking system works as one bank.

It is essential to understand that banks create money directly from the borrower's debt, not "out of thin air" as many believe. And, banks can only do so if bank credit equivalent to what they created (loan #1) is lent back to them as deposits, (loan #2). Thus, loans are just as dependent on deposits as in the conventional notion that deposits come first and then are lent out. And the bank only profits from the spread between the interest it pays depositors and the interest it collects from borrowers.

The point to note is that twice-lent money is the inevitable state of bank credit created as the debt of borrowers, because bank credit can only exist as bank deposits, the debt of banks to depositors. The bank has put up nothing other than the calculated risk of having to buy back its promises with its own existing capital assets if the borrower does not pay them back and extinguish them. No actual money or assets of any kind are required of the bank to make a so-called loan unless someone demands it in actual legal tender. Experience proves that, in advanced societies with many non-cash payment options, 3% backup in legal tender is usually enough to meet the demand. (13)

Money-as-a-debt-of-itself is one way to describe what we use every day in our transactions. Except for criminals, we generally do all of our large transactions with the promises represented by the numbers in our accounts, not the paper cash itself. Thus, the banks are free to create bank credit from our promises to pay it back based on risk alone, essentially without reference to the supply of base money. (17) However, banks can't push on a string. If borrowers don't want to borrow, debt-money creation slows down.

International bank guidelines require banks to have between 0 and 8% capital adequacy, a term basically meaning the ability to absorb that percentage of loan losses without failing as a business. The difference in percentages depends on the risk involved in any particular debt. It is worth noting that capital adequacy requirements for triple-A and double-A rated national government debt is *zero*. (14) Quality sovereign debt is assumed to be fail-proof and thus zero-risk. Therefore, when banks buy national government bonds (sovereign debt) they may do so with credit they create from the bonds themselves, and with no capital backup in case of non-payment. Banks can safely issue these promises of legal tender they don't have because their promises will be lent back to them as deposits, indefinitely deferring redemption in legal tender. System wide, bank credit created equals bank credit deposited. No existing money is required of the banks at all. The banks pay themselves from the interest collected on a steady stream of newly created bank credit.

If more aggregate reserves of legal tender are required, due to public demand for cash, or to comply with statutory requirements, the nation's central bank will supply those aggregate reserves. (15) (16) The monetary model taught to economists is that of a "fractional reserve" system in which central banks control the total money supply through control of the supply of "base money" and the "money multiplier" allowed to banks. This concept is described as an empirically disproved "myth" in a recent working paper submitted to the International Monetary Fund. (17) The description of banking practice in this report is instead, congruent with the description I have provided in the Money as Debt Trilogy, in this paper, and on my website.

Perpetual debt

The foregoing description demonstrates that almost all money, except coins, enters circulation as debt to a bank with a rigid schedule for repayment. At the same time, those who can accumulate more money than they need to spend, lend it indefinitely to banks as savings, and to others as loans of existing money. Only after someone *borrows* the existing money back into circulation, can it be earned by the borrowers that created it. Competent borrowers will, therefore, pay off their money-creation bank loans with the principal of existing-money loans, or other money-creation bank loans. In either case, if money created as a loan is not available to be earned on time and has to be replaced with the principal required to be repaid for another loan, a perpetual debt is set in motion.

Typically, the goal of the existing-money lender is to add some interest to principal, rolling the existing-money principal like a snowball, enlarging the perpetual debt. Those who have existing money to lend are generally those that have money in excess of their spending needs. Therefore, it would be logical to expect perpetual debt levels, defaults and forfeitures of collateral would increase as income disparity increases. There is also no limit to how many times a single unit of bank credit might be re-lent. Taking secretive debt into account, it may not even be possible to find out. The more bank credit is lent again as existing money or diverted indefinitely into gambling, the less bank credit is available to be earned by those who created it and need it to pay off their debts.

Compound interest is twice-lent money

Twice-lent money takes another more familiar form as well, one long associated with income disparity, debt enslavement and economic hardship. (18) Consider that compound interest, interest charged on unpaid principal or interest, is new interest on the same original principal. Therefore, the same principal is being lent a second time. Compound interest is simply another form of twice-lent money. Also, if a lender collects interest and then lends it as new principal, rolling the principal like a snowball, that also is twice-lent money. By design of the system itself, we all have twice-lent money. It is deposited in, or in other words, *lent* to our bank(s). Our savings accounts compound interest into new principal continuously. However, simple interest on a loan, paid in installments and spent by the lender, cannot possibly result in any mathematical impossibilities, despite what many money reformers preach.

The "impossible interest" fallacy

Many activists who call for reform of the monetary system, contend that simple interest itself causes the impossible math at the root of system dysfunction. They ask, if only the Principal (P) exists how can the Interest (I) be paid? They consider irrefutable the static equation $P < (P + I)$, the equation that sums up the completion of a loan, and conclude that the money supply or "stock" must continually grow to provide the money to pay the interest. This fallacy is generally illustrated with an isolated environment scenario in which all loans are concurrent and have to be paid back in *one lump sum* plus interest. Only the principal exists, so it is impossible to pay the interest when demanded in one lump sum. (19)

But interest is normally paid in installments, so both the fanciful stories and the $P < (P + I)$ equation are inaccurate models because both fail to account for *flow*, the use of the same money through multiple transactions. P is the stock of the loan and flow multiplies stock. One dollar can be paid any number of times to pay off any amount of interest debt. The only criterion necessary to make this clearly mathematically possible is that the borrower be able to earn the full dollar back each time it is paid to the lender.

In other words, if the interest is spent, not lent a second time, there is no mathematical problem. Every loan is potentially self-sufficient for full repayment of both the principal and any amount of interest. Using even simpler logic, the amount of interest owed in any given month is just a tiny fraction of all the money in existence. The borrower may not have the opportunity to earn it, but because it is not extinguished when paid as interest, it exists. Therefore, the idea that interest causes a *mathematical* shortage of money with which to pay off debt, is not only incorrect but impossible and even logically absurd. Impossible debt arises only when principal has been lent more than once. It is quite puzzling to me that so much focus is directed upon an easily disproved imaginary mathematical problem with interest, while there is no recognition at all of the very real shortage of principal that results from re-lending principal that is already a debt-of-itself. The inequality, $P < nP$ for any $n > 1$ requires perpetual debt growth or inevitable default, i.e. *grow-or-collapse.*

Other money

The model used so far has been incomplete. Banks create new credit money to buy equities also. (20) To buy equities like stocks and real estate, banks simply write checks against themselves, knowing that the promise of legal tender on demand they just spent will be lent back to the banking system by the seller as a deposit, relieving the banks of any need to have the legal tender promised. Just like a loan, on the bank's books the value of the equities bought balances the new promises of legal tender on demand the bank created to buy them. But, unlike the court-enforced repayment of a loan, this bank credit is not due to be repaid on a schedule. It becomes, instead, an elastic and uncertain expectation of return from the equity. Theoretically, this money is available to be spent by the seller, circulated, earned by a borrower and used to pay off a debt. However, the value of equities can sink below their purchase price, and become red ink on the bank's books just as bad loans can. And, equities usually rise in value in step with expanding credit, often as mutual cause-and-effect. Beyond that, any money created to buy equities may, in turn, become the principal of an existing-money loan. It takes only *one* such lender to interrupt the flow back to the original money-creation borrower, be it a massive money market fund or kindly Uncle Bob.

Just when productive equity investment that leads to full employment is most needed so that borrowers can pay their debts, that same debt is destroying demand, and perpetual debt is causing mathematically inevitable defaults, throwing people out of their homes onto the street. The situation provides no business case for new investment and employment. This leaves only the taxpayers themselves to prime the pump by going even further into debt for Keynesian money injections to hopefully jump start more exponential growth, which will simply result in another crash somewhere down the road. Completely left out is any consideration that perpetual growth cannot be sustained on a finite planet, and any money system that continues to depend on perpetual economic growth will eventually result in planetary ecocide.

There is no fundamental questioning by leadership at any level, world, state or local, why the most materially prosperous society in the known history of the planet is being dragged down by a hopeless debt of numbers on computer screens representing a thing-in-itself called money created by banks that produce nothing except debts of the stuff. Economist Steve Keen is currently trying to educate his fellow economists about what he calls "endogenous money". (21) If economists have not yet taken into account what money created as debt to a bank really means, then how could they possibly be expected to take into account the destabilizing dynamic of twice-lent money? My theory is that twice-lent money creating perpetual debt is the reason we find ourselves in a grow-or-collapse situation that economists can't explain. Furthermore, I contend that the only real escape from this trap is to *change our concept of money.*

Money-as-a-thing-in-itself is incompatible with a credit-based system

In a free society, who has the right to forbid me to make a contract of my own choosing and pay interest if I agree to it? And who has the right to force me to spend my money or stop me from lending my savings at interest, forever if I choose to. So how can the instability caused by money as a thing-in-itself being lent more than once, ever be prevented without a resort to monetary totalitarianism in which there is only one global bank and all other lending is outlawed? How would that be enforced?

I can only conclude that for a positive outcome, the primitive coin concept of money must be recognized for the monopolistic political control system it is. It is fundamentally incompatible with individual freedom and mathematically incompatible with a credit-based money system. If we desire to be able to build a sustainable society that can adapt to a future constrained by reduced resource availability, but blessed with exponential increases in knowledge and technology, we must be able to experience shrinkage of our economy, involuntary or planned, without it causing unjust and disastrous consequences like mathematically inevitable defaults. The coin model fails that requirement and must therefore be replaced by some monetary design that is equally functional in expansion, stability or shrinkage.

The coin model of money has been instilled into our minds since we were first given pocket change to spend as children, and is very difficult to dislodge for most people. But the coin concept of money was only ever necessary because, long ago, there was no other technology for transferring monetary value between buyer and seller over long distances other than to physically transfer portable objects of value. But this is no longer the case in an era when specific credits for anything from iron ore to electricity to lumber, carrots or childcare can be sent around the world almost instantly from a portable keypad hanging from your neck while skydiving.

A different concept of money

Before coins were made necessary by long distance trade, short distance money was promises of specific goods and/or services from specific suppliers in the neighborhood - barter credits payable in the promised goods and services only. Often this took the form of written credits for a farmer's grain stored in the temple grain bank. The crucial conceptual difference is that barter credit money is defined in value by the specific portion of real world abundance it promises, rather than the scarcity of the medium of exchange itself. It is my further hypothesis that this change of concept is the at the heart of the radical transformation we need to make if we wish to escape the exponential growth imperative and make a serious attempt to reduce our impact upon the planet. In *Money hypothesis 2; a different concept of money*, I will explain in more detail my

hypothesis of how, using today's technologies, a beneficial and adaptive new economy, equally capable of handling growth, contraction or stability, without harm, could be built upon the most ancient and natural concept of money, what I call "self-issued" credit.

About the Author

I am a professional artist, writer and moviemaker with a partial university education in physics and chemistry. I have had extensive experience in researching and explaining to a general audience, environmental and political issues as diverse as energy return on energy invested, municipal zoning bylaws, and the science of island groundwater. My 14 years of self-directed study of the monetary system and economics have resulted in the Money as Debt Trilogy, animated cartoons that have been viewed by tens of millions of people in 24 languages, and are widely praised for making our money system understandable to people worldwide.

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