

*Article 1.7***THE “CREDIT TSUNAMI”***Explaining the inexplicable with debt and deleveraging.***BY STEVE KEEN***September 2009*

In his October 2008 testimony to the House Committee on Oversight and Government Reform, Alan Greenspan described the financial crisis as a “once-in-a-century credit tsunami.” Like most of his utterances while chairman of the Federal Reserve, the phrase is pungent, evocative—and utterly misleading.

Though geologists understand the cause of a tsunami—a large undersea earthquake triggered by movements in the earth’s tectonic plates—they also know that its timing is inherently unpredictable, and nothing can be done to prevent one. Once a tsunami has occurred, the forces that caused it are dissipated, and another may well take a century to develop.

The global financial crisis is an entirely different kind of beast. First, unlike a tsunami, the force that gave rise to the crisis—excessive private debt—is still with us. If not addressed by deliberate policy, it will plunge the U.S. economy into a “lost decade” that will be far more painful than that which crippled Japan in the 1990s.

Second, geologists understand what causes tsunamis. As Greenspan’s convoluted words nonetheless make clear, he and most economists do not understand why the global financial crisis occurred:

To exist, you need an ideology. The question is, whether it...is accurate or not. What I am saying to you is, yes, I found a flaw...in the model that I perceived is the critical functioning structure that defines how the world works, so to speak.

Third, though geologists understand tsunamis, they do not cause them. In contrast, the policies implemented by neoclassical economists like Greenspan, former Treasury Secretary Larry Summers, and current Fed chair Ben Bernanke in the last two decades made this crisis at least twice as severe as it would otherwise have been. Completely oblivious to the dangers, these powerful official economists—and the vast majority of their colleagues in academia—encouraged a debt-financed speculative bubble in asset prices that financed 20 years of illusory prosperity but was doomed to burst and usher in a sustained economic downturn.

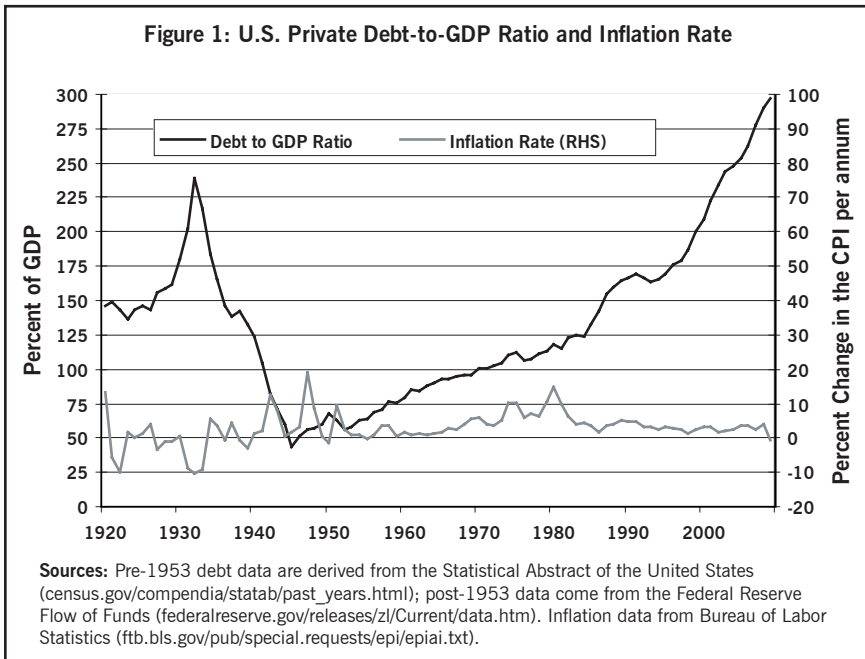
The Economy that Leverage Built

I am one of the handful of economists who did predict the crisis, as listed by Dutch economist Dirk Bezemer. Bezemer noted that though we came from varied ideological backgrounds (to use Greenspan’s phrase), we shared four concerns: “with financial assets as distinct from real-sector assets, with the credit flows that finance both forms of wealth, with the debt growth accompanying growth in financial wealth, and with the accounting relation between the financial and real economy.”

My own analysis uses a theory of monetary dynamics known as “circuit theory” to extend the financial instability hypothesis developed by economist Hyman Minsky in the 1960s. Both played a key role in helping me identify that a crisis was imminent. From Minsky I focus on the debt-to-GDP ratio as the key indicator of financial fragility, while circuit theory helped me to develop a purely monetary model of the economy in which changes in debt play a crucial role in determining the level of aggregate demand.

The debt-to-GDP ratio—which effectively shows how many years it would take to reduce debt to zero if all of GDP were devoted to debt repayment—has been in danger territory, not merely since the subprime crisis began, but ever since the stock market crash of 1987. In the early 1990s, the ratio approached 175%, the level that caused the last Great Depression.

Had the Federal Reserve not intervened to rescue Wall Street in 1987, it is quite



possible that we would have had a mild depression back then. De-leveraging (that is, devoting part of income to reducing debt rather than to spending) would have depressed economic activity, and it would have been a mild one because inflation would have helped reduce the debt burden. Instead, the Fed’s rescues encouraged the financial sector to move from one debt-financed bubble to another—first the savings-and-loan bubble, then the dot-com, and finally the subprime.

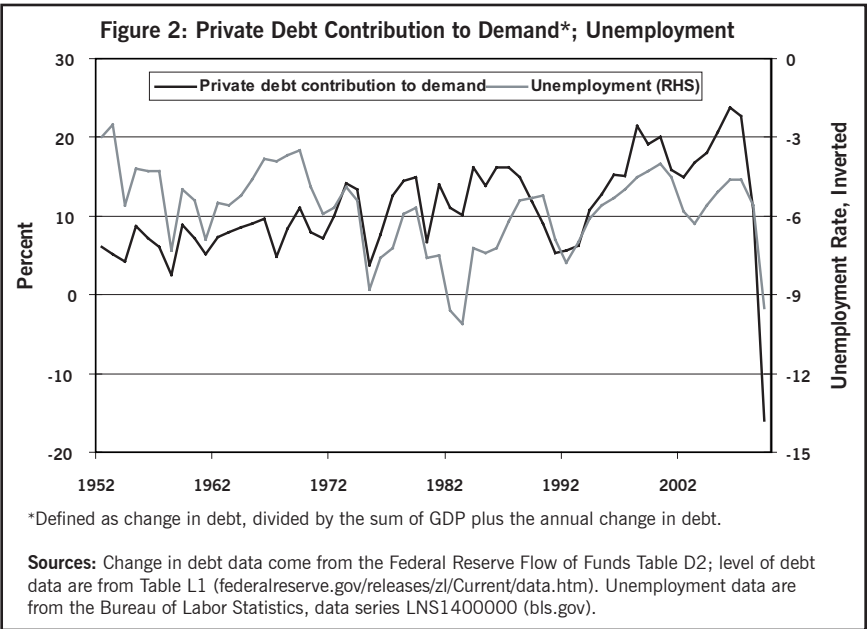
As bubble gave way to rescue and a subsequent bigger bubble, the debt ratio grew from a Depression-level 165% of GDP in 1987 to an unprecedented 298% by March 2009. The unwinding of this huge debt burden, coupled with an inflation rate that has now fallen below zero, is causing a deleveraging-led economic downturn that will rival the Great Depression in severity.

Leverage and Economic Activity

The economic ideology that Greenspan now concedes is false asserts—among many other false propositions—that money has no long-lasting impact on the real economy. In fact, we live in a fundamentally monetary credit-based economy, and in such an economy, aggregate demand is the sum of income *plus the change in debt*.

When the debt-to-GDP ratio is small, so too is the contribution that an increase in debt can make to demand, and changes in debt are relatively unimportant. But as debt grows relative to GDP, then even a small change in debt can constitute a major proportion of aggregate demand. Figure 2 illustrates the rising role of debt in driving demand by showing the correlation between the debt-financed fraction of demand and unemployment.

As the private debt-to-GDP ratio rose from under 50% of GDP back in 1950



to six times that today, the share of aggregate demand that came from an increase in debt rose from as little as 2% in 1954, to as much as 28% in mid-2007. In the '50s and '60s, when the debt ratio was below 100%, debt's contribution to demand had little impact upon unemployment. But from 1975 on, this contribution explained most of the movement in unemployment: when debt-financed spending went up, unemployment went down (the correlation coefficient between the two series since 1990 is -0.83). Our economy had become debt-dependent, and the Fed's rescues simply extended this period of debt dependence for another two decades.

This fundamentally monetary contribution to demand was completely ignored by conventional neoclassical economists like Greenspan and Bernanke, yet it was primarily responsible for the illusory prosperity of the last fifteen years—which, before the bubble burst, they happily attributed to their own good economic management in what they called “The Great Moderation.” Throughout that period, the

increase in private debt was responsible for over 18% of aggregate demand.

Unfortunately, leverage is a factor that cuts both ways: while a debt-financed speculative bubble drives up demand, the deleveraging that happens after the bubble bursts subtracts from it. Deleveraging by the private sector is now reducing aggregate demand by over 10% and driving unemployment up as a result. Given the scale of debt today, at 70% above that of 1929, it could take much more than a decade of deleveraging to reduce debt to levels at which its contribution to economic activity is minor.

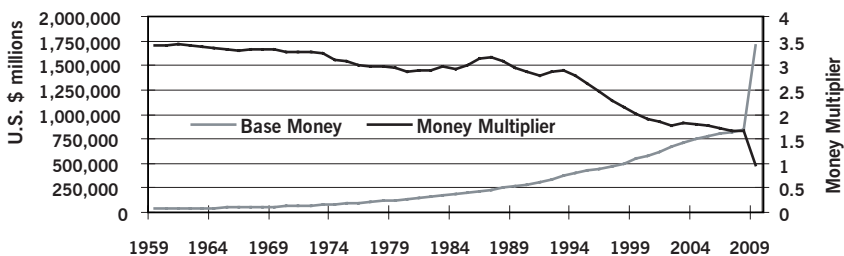
That period will be one in which aggregate demand is substantially below GDP, since debt will be reduced by households and businesses spending less than they earn. This contrasts with the last six decades, when debt grew almost every year, and the increase in debt each year financed spending in excess of earned income. With deleveraging, growth in demand will be less than the growth in output, and growth will fall below the level needed to sustain employment.

Can Bernanke Do It?

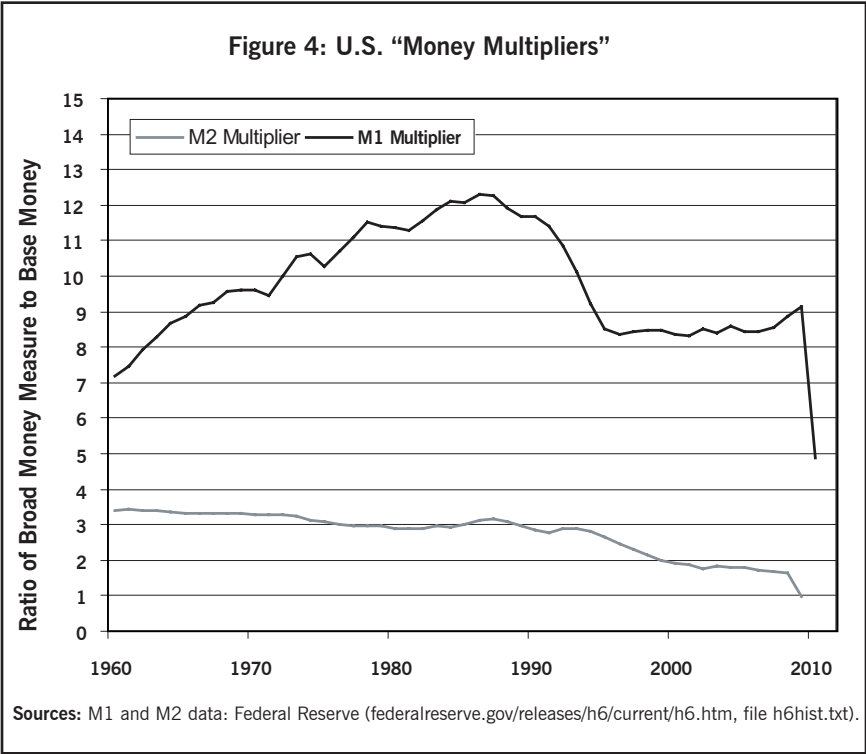
Having helped caused this mess by ignoring and effectively encouraging the growth of debt-financed asset bubbles, Bernanke is now attempting to ward off deflation via “quantitative easing”—a dramatic increase in the level of base money (currency and commercial bank accounts with the Federal Reserve)—in an attempt to cause a substantial expansion in the money supply, and hence cause inflation. He explained the strategy in 2002: “prevention of deflation remains preferable to having to cure it. If we do fall into deflation, however, we can take comfort that the logic of the printing press example must assert itself, and sufficient injections of money will ultimately always reverse a deflation.” Bernanke is certainly being true to his theory. The problem is that his theory is false.

In the model he employs, the money supply is determined by (a) the central bank’s injections of “base money” into the economy, and (b) the “reserve requirement” it sets—in the United States, 10%. So an injection of \$1 trillion into bank reserves via “quantitative easing” should result in a total of \$10 trillion being created. The process, called the “money multiplier”, is that the first recipient banks

Figure 3: U.S. Base Money and M1 "Money Multiplier"



Sources: Base money data: Federal Reserve (federalreserve.gov/releases/h3/current/h3.htm, file h3hist1.txt). M1 data: Federal Reserve (federalreserve.gov/releases/h6/current/h6.htm, file h6hist.txt).



keep 10% of the deposited money (\$100 billion) and lend the rest—creating \$900 billion of debt as well. Then the borrowers deposit that \$900 billion in other banks, who keep 10% of this (\$90 billion) and lend out the rest (\$810 billion). This process repeats until \$9 trillion additional credit money—and debt—has been created.

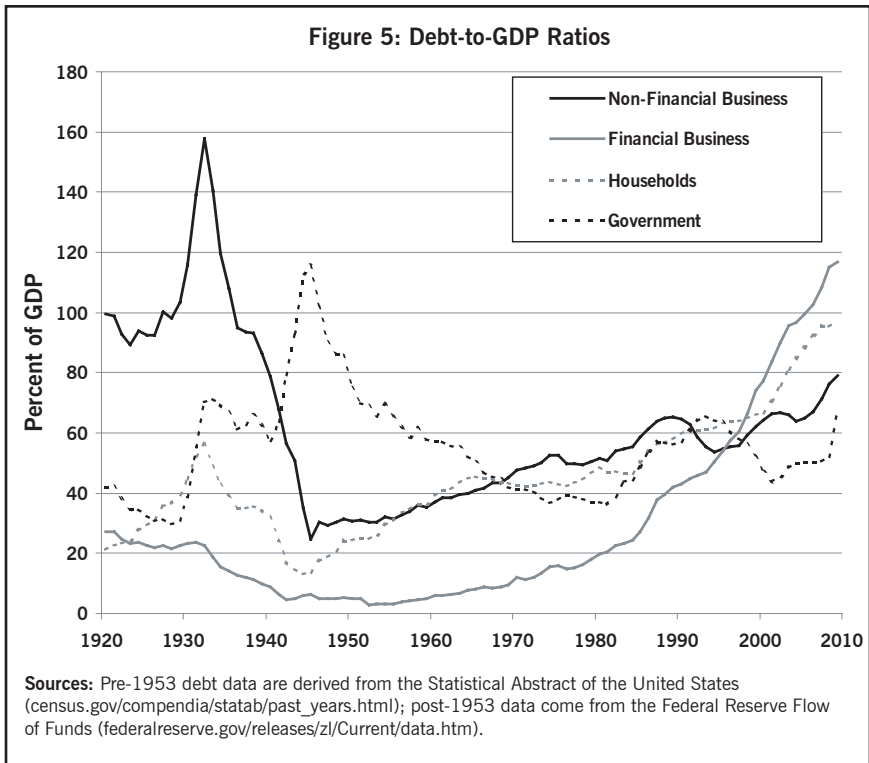
This model sees lending as being constrained by banks’ limited capital, so that providing them with reserves in excess of their needs will spur a lending and credit creation process that will in turn increase the money supply and cause inflation.

As the data emphatically show, that is *so* not what is happening. Instead reserves are filling up and *not* being lent—and with good reason. Bank lending is constrained not by any lack of cash, but by the unwillingness of banks to lend, and the unwillingness of a public that is already \$45 trillion in debt to take on the additional \$9 trillion in debt that this vision of the money creation process requires.

Not only is aggregate private debt higher than at any time in history, it is also spread more widely than ever before. Non-financial businesses have a debt burden (as a share of GDP) just 20% below the level of 1930; households are carrying 2.5 times that level, and the financial sector tops the polls with six times its 1930 level. Even government, whose debt should move counter-cyclically to private debt, has twice the debt-to-GDP level it had in 1930.

There is simply no one left to lend money to.

In this real world, the so-called money multiplier—the ratio of a broader measure of the money supply like M1 or M2 to base money—is collapsing. The ratio



has collapsed to below 1 for M1, and for M2 the ratio has virtually halved in the last year.

This is striking confirmation that the money multiplier model is false, as claimed long ago by Canadian economist Basil Moore, and that the “loans create deposits” perspective of the European monetary circuit school is correct. The basic proposition of this model is that the banking sector is effectively unconstrained in its lending, and the act of a bank creating a loan simultaneously creates a deposit of the same size—thus “loans create deposits.” Thus rather than banks being powerless to create money until they receive deposits from the public, the very act of giving a loan simultaneously creates deposits.

I have developed a mathematical model of the process of money creation in a pure credit economy without a government sector. The simplest possible version is described in the table below, which shows the financial flows that would exist in a simple credit-driven economy in which there had been a single loan from the banking sector to the firm sector.

The loan obliges the firm sector to pay interest (A), which is a transfer from the firm’s deposit account at the bank to the bank’s account. The firm then hires and pays workers, creating a flow of funds from its account to households (B). Finally bankers and workers consume, and pay for what they consume by transferring money from their accounts to the firm’s account (C & D).

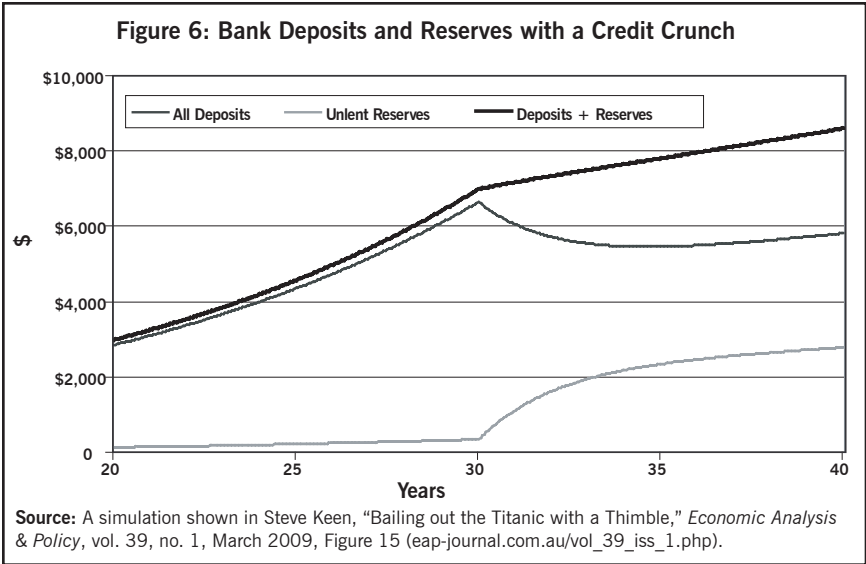
In this “bare bones” model, A is the interest rate times the outstanding debt, B is a function of the amount in the firm’s deposit account reflecting its need for

workers, and C and D are functions of the amount in the bank’s and households’ accounts respectively reflecting their consumption rates. A dynamic model with 3 variables (technically a system of coupled “Ordinary Differential Equations” with 3 system states) is derived simply by adding up the entries in each column, and it describes a self-sustaining “toy” economy with a constant credit money stock, constant economic activity, and constant wages, profits, and interest earnings for the three sectors. (This contrasts with works in the Circuitist tradition that erroneously claim that a constant rate of economic activity would require continuous injections of new money.)

Bank Balance Sheet	Assets	Liabilities (Deposits)		
	Loans	Firm	Bank	Household
Interest on Loan		-A	+A	
Hire workers		-B		+B
Consume		+C+D	-C	-D

An extended version of this model simulates a “credit crunch” (see my article “Bailing out the Titanic with a Thimble,” available online at cap-journal.com.au, for the technical details). When three key parameters change suddenly—the rate of loan repayment jumps, and the rates of re-lending of reserves and new money creation drop dramatically—the results include a collapse in deposits and a dramatic rise in bank reserves, just as we are experiencing now.

Bernanke’s quantitative easing simply throws more money into a pool from which banks are extremely reluctant to lend. Though the sums involved are enormous—of the order of \$1 trillion—they amount to less than six month’s interest on the current level of U.S. private debt, and less than half the amount by which the



private sector has reduced its leverage in the past year. The private sector is taking money out of the economy at a far faster rate than Bernanke and Obama together are throwing money into it.

My prognosis is therefore that the U.S. economy will continue to suffer a prolonged deleverage-driven downturn until such time as the level of outstanding debt is tackled directly—either by a never-ending wave of bankruptcies amid rising unemployment, or by the abolition of debt that should never have been created in the first place. □

Sources: Ben S. Bernanke, “Deflation: Making Sure ‘It’ Doesn’t Happen Here”, Federal Reserve Board, 2002; Ben S. Bernanke, “The Great Moderation,” remarks by Governor Ben S. Bernanke at the meetings of the Eastern Economic Association, Washington, DC February 20, 2004; Dirk Bezemer, “‘No One Saw This Coming’: Understanding Financial Crisis Through Accounting Models,” Faculty of Economics, University of Groningen, The Netherlands; A. Graziani, *The Monetary Theory of Production*, Cambridge University Press, 2009; Alan Greenspan, “Testimony of Dr Alan Greenspan to the Committee on Oversight and Government Reform,” in *The Financial Crisis and the Role of Federal Regulators*, U.S. Congress, Washington, 2008; “Hearing on the Role of Federal Regulators in the Financial Crisis,” House of Representatives, C. o. O. a. G. R. 2008, in Committee on Oversight and Government Reform, U.S. Congress, Washington; Steve Keen, “Finance and Economic Breakdown: Modeling Minsky’s ‘Financial Instability Hypothesis’” *Journal of Post Keynesian Economics*, vol. 17, no. 4, 1995; Steve Keen, “Keynes’s ‘revolving fund of finance’ and transactions in the circuit,” in *Keynes and Macroeconomics after 70 Years*, R. Wray and M. Forstater, eds., Edward Elgar, 2008; Steve Keen, “Bailing out the Titanic with a Thimble,” *Economic Analysis & Policy*, vol. 39, no. 1, 2009; Hyman P. Minsky, “The Financial Instability Hypothesis: An Interpretation of Keynes and an Alternative to ‘Standard’ Theory,” *Nebraska Journal of Economics and Business*, vol. 16, no. 1, 1977; B.J. Moore, B. J. 1979, “The Endogenous Money Stock,” *Journal of Post Keynesian Economics*, vol. 2, no. 1, 1979.