

# Money, Credit, Debt, Deficits, National Debt, and China

Some of the most interesting things for me to write about are the economic problems that exist and what we should do to fix them, but I find that I can't even begin to describe either unless the basic functioning of the economy is understood first. We need to understand the roles played by the government, financial, business, foreign, and household sectors in the economic system. To assess those we need to think about what they *should* do versus what they *actually* do. Of course "what they should do" is always open for debate.

I initially set out to talk about all of those things, but after writing for a month I've realized that this is an impossible task and reluctantly limited myself here to a discussion of the basic functioning of the economic system. To do even that much I've had to assert some ideas about what the economic system should do that probably deserve a longer discussion. If you find that you disagree with some of that, feel free to send me your thoughts and that could provide a useful future topic of discussion.

In this paper I've tried to cover all the important concepts, but treat each as simply as I can. That means that in some cases I've ignored or glossed over ideas that I believe are less important. Oh well, short of writing a whole textbook, this seems like the best way to go. As always, questions and comments are appreciated.

This paper got to be MUCH longer than I'd like, so to help keep you oriented as you read through it, here is a general of the topics I'm going to cover in outline form:

1. The Nature of Money and Debt
  - Throughout history, money was primarily created as an artifact of the extension of credit.
  - The amount of money in circulation was really a measure of the level of debt (and vice versa of course).
  - The value of money is tied to the ability to collect on the debt that it represents.
  - The nature of banking. The evolution of various forms of money.
2. Creating Wealth: Investment and Saving
  - Individuals gain wealth by trading lower-valued assets for higher-valued assets.
  - Value is relative to each individual, so trades can create wealth for both parties.
  - Businesses transform low-valued materials and labor into higher-valued products.
  - Capital investment acquires the equipment and other facilities necessary to produce products.
  - Successful wealth creation requires consumption
  - Debt (money) is needed to fund both investment and consumption
  - The value of goods and services produced in the economy depends of the level of consumer demand for them.

- Total demand at any given time depends on the size of the consumer population and the level of disposable wealth available to it.
  - The demand for any particular good or service produced depends on its value relative to other goods and services available to consumers.
  - Investment and consumption tend to rise and fall together during business cycles.
  - Both increased investment and increased consumption require an increased level of money (income and/or credit) to finance those activities.
3. Money and Monetary Transactions
- Base money and Fed transactions
  - Broad money and bank transactions
  - Constraints on the amount of bank loans.
  - Treasury transactions
  - Fiat money (which is what we have had in the US since 1971)
    - Issued by currency sovereigns
    - Similar to, but fundamentally different from previous forms of money.
  - The value of fiat money.
  - Unconvertible implications
  - Why Fed accounting is wrong and what it should be
  - Money creation summary
4. Money Movement Across Sectors
- Sectors and their roles in the economy
    - Public
      - Federal government
      - State and local governments
    - Private
      - Households
      - Businesses
        - Financial
        - Non-financial
      - Foreign
  - The inter-sector money flow constraint
  - Movement in and out of sector savings pools
    - Public
      - Taxes
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    - Foreign
      - Imports
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    - Private
      - Savings
      - Investment
  - Using debt to add to pools
  - Debtless additions to the government pool
5. Money Movement Within and Across Markets
- Financial markets
  - Non-financial markets

6. Economic problems
  - Economic goals
  - What causes economic problems
7. The National Debt
  - The role of the Federal Reserve
  - Direct Treasury funding from the Fed
  - The current nature of Treasury debt
  - The debt limit
  - Treasury debt and liability
  - How foreign countries acquire U.S. debt
  - The implications of high levels of U.S. debt held by foreign countries

Inflation risk from high U.S. debt

Throughout this discussion I've tried to be pretty explicit about how the accounting for everything is done from the perspective of each participant in the transaction. If you're not familiar with how double-entry bookkeeping works, I've provided a brief overview in an appendix to this paper which you might want to read before proceeding. It's even probably good for those of you who are already familiar with accounting concepts because you'll see which things I'm going to use in this discussion. It's not all that difficult and when you understand it you will gain a more precise understanding of exactly what happens in each type of activity that is discussed.

If you don't have a lot of time to read all this, take one section per day (or however long it takes you) and make sure that it makes sense to you before proceeding. Please ask questions if you think something I've said doesn't make sense.

To make it a bit easier to access each section, their page numbers are listed below.

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## Section 1: The nature of money and debt

Money is perhaps the most confusing economic concept that exists. At different times in history we have used it as:

- A store of value
- A medium of exchange
- A record of debt
- A unit of account

and it is often all of these things at once.

I think it's probably best to start the story with debt and then later take up the concept of money. Debt evolved hand-in-hand with various forms of social cooperation. When you help me to do something I owe you a debt which I will repay later by helping you do something. That's a fairly easy concept when all forms of labor are largely equivalent. You can value the debt in terms of the time and effort put in by each party. Early social and economic progress was made by specializing labor. Each individual developed skills for a particular task and therefore became more efficient at it. In this way more could be accomplished collectively by the group.

But specialization made the assessment of debt somewhat trickier because an hour of labor from a particularly skilled individual was obviously worth more than an hour of labor from someone less accomplished. And of course social cooperation involved the lending of more than just labor. Raw materials of various sorts, tools, land, raw materials, etc. were all loaned out in the expectation that they (or more commonly, something comparable) would be returned later. It's much too complex to discuss all the forms that this took. If you're really interested I'd suggest reading David Graeber's book "Debt, the first 5,000 years". Various methods were used to record and track these debts (tabs, beads, shells, notched sticks, stone tablets, journals, IOU's, etc.).

Personal notes evolved as a sort of IOU that acted as a more permanent record of debt. These have a natural value that depends on both what is promised (the face value of the note) and the reliability of the person making the promise (which can make the actual value somewhat less than the face value). Such notes are a good example of a *financial asset*. A financial asset is defined as any intangible asset that derives its value from a contractual agreement (typically a debt payback agreement). Keep that term in mind, because I'll use it often and it will become more important in later discussions.

Like any asset of value, financial assets could be traded. People who were given a note could trade it to obtain something of value for themselves or even use it to settle up their own debts. The one thing to be clear about here is that financial assets and debt form a duality. They are mirror images of the same contractual arrangement. As you might expect, people were reluctant to accept notes that were issued by someone that didn't know and whose reliability was therefore in question.

*Money* (at least in our current world) can be defined as being any financial asset that can be readily exchanged at its face value. Economists would say that money is the

most *liquid* form of financial asset. One of the things that makes it difficult to say exactly how much money exists in an economy is deciding which financial assets should be called money and which should not. There are actually several different official measures of money, each of which, includes a somewhat different set of financial assets.

We'll see in a bit that the exact same relationship between debt and money that defined the original IOU continues to exist with contemporary money. That becomes especially important when people talk silliness like eliminating all of the national debt, because to do so would require a substantial reduction in everyone's savings as well! That conclusion probably won't be obvious to you at this point, but later on you'll see why that must be the case.

Bankers came into being as a means to issue reliable notes that could be traded at face value; that is, to create money. They have existed in one form or another for at least 3,000 years. A borrower could go to a bank and exchange his own debt for bank notes (i.e. bank debt) and then use them to procure something from a third party. The bankers would assume the risk of the borrower's debt (i.e. the risk that the borrower would default on his or her debt) in exchange for part of the value of the exchange. So instead of A giving B something and holding B's note, B would go to a banker, give him a personal note, and get bank notes in return. Then B could use those notes in a trade with A to get what he wanted. A accepted the notes from a reliable banker because he knew that he could exchange them with others and not lose value in the process. Typically A's note to the banker was for more than the face value of the notes that he received, so assuming that A actually paid off the debt, the banker ended up making a profit for this service.

To further guarantee bank notes and make them more widely acceptable, bankers came to specify a certain quantity of some tangible asset (typically a precious metal like gold or silver) that they would exchange for their notes. To the degree that they honored these promises, their notes were accepted. This *conversion guarantee* also had the effect of making it possible to establish a proper equivalence between any form of debt and any form of repayment. Commonly traded notes became, therefore, a form of money.

Just to be complete, we should note that not all forms of money that have existed represented a debt of some sort. Precious metals were often used as a medium of exchange and their value was determined exclusively by their weight. Traders would carry around scales to make sure that they knew the precise value of a chunk of metal. This was inconvenient, to say the least, and there was an obvious need to standardize the medium of exchange in a way that avoided the requirement for everyone to weigh everything. Governments got into the act by minting coins with a stamped face value and eventually by printing bills. The government would accept precious metals from citizens and precisely convert it into coins with a specific known value. That made it unnecessary for those who wanted to trade it to carry around their own scales to

determine the actual weight. The government typically kept a fraction of the value (called seignorage) as a fee for this service.

But coins could be counterfeited or shaved, so that wasn't always reliable. Eventually the government solved that problem by separating the face value of the money from the actual value of the coin as a metal. At times, governments decreed that the money *must* be accepted at its face value. Once this was done, it was only a small step to begin minting coins with a metal content that had no real relationship to its face value. And after that notes were printed, which obviously had no tangible value. To guarantee the value of these forms of money, governments would guarantee conversion of its coins and notes to precious metal if they were presented at a designated location. In effect, those coins and notes then represented a debt of the government in pretty much exactly the same way that personal and bank notes did. So even though this form of money did not start out as a representation of debt, it ended up being virtually identical to debt-driven money.

Some people would still classify things like gold as "money" since they can often be exchanged for other things. I don't do that because whether or not such things are acceptable in trade is very dependent on the seller. As we'll see, the sort of thing that I would call money is guaranteed by some government to be acceptable in trades that occur within its jurisdiction. Just be aware that what I am calling money consists of a somewhat more restricted set of things than others might choose to include.

Throughout most of our recent history (the last few hundred years) money generally (but not always) had value by virtue of a guaranteed conversion to something of a known and accepted value. That contractual guarantee represented a debt of the guarantor to whoever held the money. This form of money became so reliable that people just continued to exchange it and only rarely converted it into the actual metal equivalent that was guaranteed. Banks and governments quickly realized that they could take advantage of this by printing more notes than they could totally convert to precious metals in accordance with the money's conversion guarantee. Thus the *fractional reserve* monetary system was born. This wasn't done just to satisfy the greed of the bankers. The truth is that as the world-wide population grew and trade began to flourish throughout the world, there simply wasn't enough precious metal in existence to back all the money that was needed to conduct all the business transactions that were occurring.

You can view any business transaction where one party procures something for money as being somewhat like the following:

- A gets something from B, thereby establishing a debt of A to B
- A satisfies his/her debt to B by providing money (which represents a debt of the money issuer)
- If B so desires, he/she can exchange the money according to the guarantee made by the money issuer.
- B can also use the money to make acquisitions of their own.

What happened as commerce grew, was that there was a mismatch between the level of debt represented by all the transactions that were occurring and the level of debt that could be incurred by money issuers (as determined by how much precious metal they possessed). The former became much larger than the latter. To accommodate the need for more money, the fractional reserve system came into common use. As long as everyone accepted the money and continued to use it to procure other things of their own, the system continued to function well.

At various times this caused problems when citizens became concerned about the reliability of conversion and decided to “get theirs while they could”. This started runs on the banks that all too often resulted in a cascade of bank insolvencies and what amounted to a general collapse of the banking system. Clearly, with more money in circulation than there was precious metal to back it, if too many people simultaneously decided to convert their money, the conversion guarantee could not be honored. Economists refer to this as a problem of *liquidity*, meaning that banks lack enough of the commodity that provides the money's underlying value. There is a long and interesting history of such liquidity crises in the U.S.

Some schools of economic thought view such problems as the primary source of all economic trouble and suggest that we should adopt very rigid methods for preventing them. The Austrian and Libertarian schools of thought fit into this category (See for example Ron Paul's book *The Case for Gold* <http://www.mises.org/books/caseforgold.pdf>). They will suggest things like a return to the gold standard with mandatory 100% reserves. In my opinion this is a completely unworkable plan. The basic problem that they are trying to fix is the over-extension of credit for speculative purposes. At least this was the basic problem that causes the various historical problems that they identify. They view this a simple case of “printing money”.

Their solution is to limit money/credit to whatever amount can be completely backed by gold. But during all of modern history, there have been numerous times where the amount of money that could be completely backed by existing gold supplies was insufficient to support all of the desired economic activity. Now it's certainly the case that we might have been better off without some of that activity because it was too speculative and led to problems down the road. But requiring that the only legal money be tied in a fixed relationship to gold would require constantly decreasing prices in order to make money go further as the economy expanded. This idea of constant price deflation is simply not a workable economic model for any number of reasons.

The fixed amount of money that would result from being on a 100% gold standard means that at some times and places shortages of money would occur with virtual certainty. That would create liquidity crises which have always been destabilizing for economies on a pure gold standard. I, for one, would not like to return to that era.

The banking system today responds to demand for money from the private sector and creates as much as needed to accommodate reasonable demands. With a 100% gold standard, the amount of money would be fixed and very high levels of competition for it

would almost certainly drive up interest rates quite significantly. That would mean that only the largest and most powerful businesses could afford to compete for loans, which would basically cripple the economy.



## Section 2: Creating Wealth: Investment and Saving

Wealth is a subjective thing. Every person values assets differently. We trade assets that we value less for assets that we value more and thereby create personal wealth. Because values are personal, a trade can increase the wealth of all parties simultaneously. Our values change over time. We trade our labor for a wage, but as we gain skill or expertise we may demand a greater wage for an hour of labor.

Businesses produce things based on the speculation that they will be able to trade them for items of more value than the raw materials and labor used to produce them. They thereby increase the value of the assets that they use in the production process. To do that they need to acquire the productive capacity needed (i.e. the tools or factory or land or whatever else is needed). We call those things *capital assets*, and we call the process of acquiring them *investment*.

What should be obvious from this description is that the more demand there is for what is produced, the more value it will have, and the more profit we can derive from it. To engage in this process, a producer must assume some debt. The first sort of debt (typically larger) is used to acquire the necessary capital assets. Next, to the degree that he or she does not already possess the raw material and labor resources needed, a (typically shorter term) *operational* debt is necessary to fund their acquisition. For the investment to be profitable, the producer must be able to pay back both sorts of debt with some extra left over so he or she has more assets than they had at the beginning.

It's probably not unreasonable to use the level of aggregate wealth as a measure of economic health. I certainly recognize that there are all sorts of reasonable caveats to this assertion. We must be careful not to sacrifice the long-term well-being of our planet or posterity in order to maximize our current income. Those sorts of tradeoffs are important to consider, but beyond the scope of this paper. I'm actually something of an optimist in this regard in that I think the best way to avoid long-term problems is to make as much technological progress as we can, as fast as we can, so that we can overcome any problems that may arise. If we take a "go-slow" approach instead, I fear that the pressures of increasing population or a random asteroid strike or super-volcano eruption will eventually cause many more problems which will then be unsolvable and cause a much higher level of general misery and poverty. So with that said, let's plow ahead.

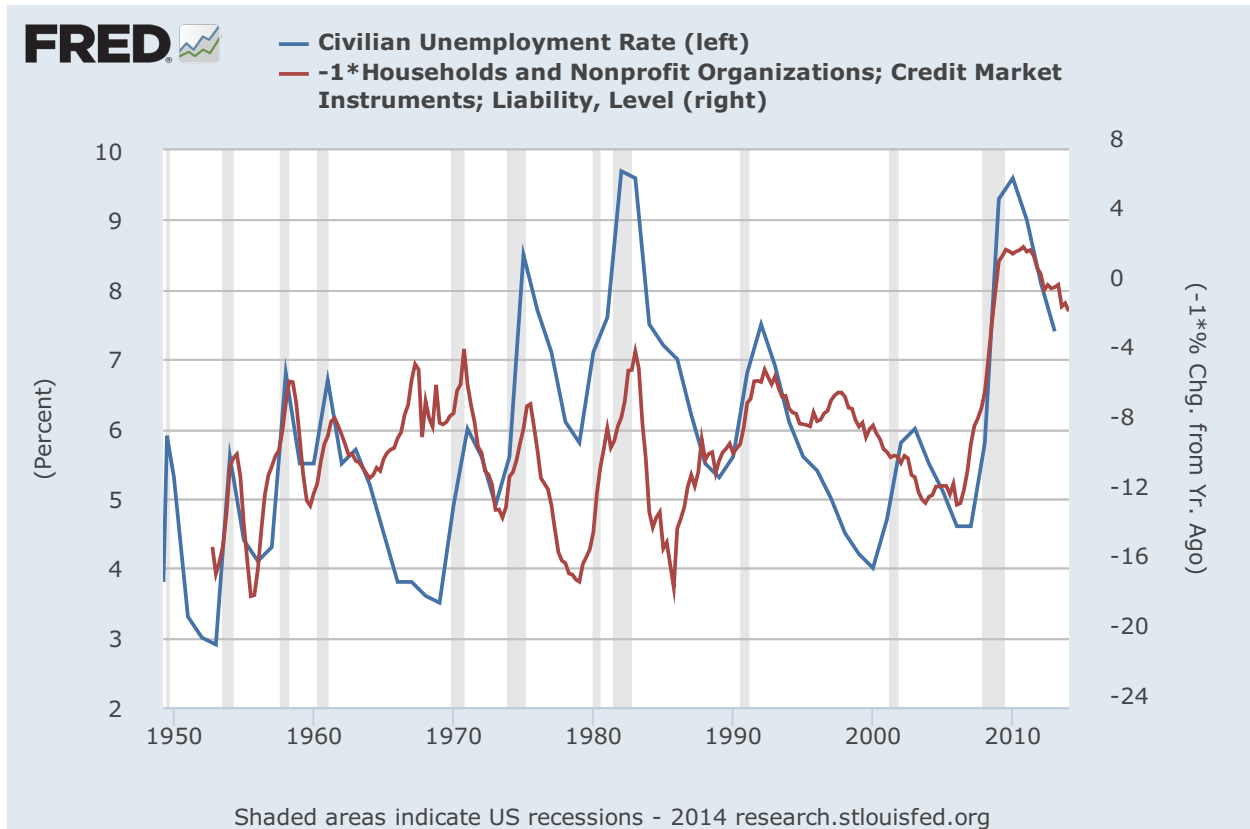
Let me submit that to grow aggregate wealth we need to fund both investment and demand adequately. Investment, absent sufficient demand, will initially result in an excess of productive capacity that often has secondary consequences of over-production and a build-up of inventories. That will be quickly followed by a decrease in production and less future investment. Demand, absent sufficient investment, will eventually result in insufficient productive capacity and therefore price inflation occurs as consumers compete for scarce goods and services. This is a dynamic process. Producers adjust their level of investment based on expected future demand and consumers adjust their level of spending based on their expectation of future income.

Investment and demand almost always rise and fall together and the dynamics of the process result in a cycle that reinforces itself. For example, if consumption falls for some reason, then producers make fewer things and in so doing spend less on labor and on investments. Those decreases result in less income for households and so they consume less. You can see that this sort of vicious cycle can easily result in an economic downturn. In contrast, in an expansionary economy investors expect more consumer spending in the future and so invest more in capacity in order to be ready for it. They may pay employees more to assure that they are available to address the increased demand. This makes the future look brighter to consumers who will tend to spend more and thereby bring about the very future that was expected. This is the nature of a virtuous cycle.

The introduction of new technology also plays a critical role in creating new wealth. It may result in improving productivity; that is, by making it possible to produce more goods and services using fewer labor hours and less raw materials. Technology may also result in entirely new products and/or improvements in the quality of existing products, thereby increasing demand for those products. It is therefore in the best interests of any individual company to introduce new technology into its product line. This creates additional demand for new technology throughout the economy, which contributes to overall economic gain.

Both investment and consumption must be funded in some manner. Typically that happens either by using some of the current income of the investor or consumer or by borrowing the money needed. When borrowing to consume, we hope to repay the loan out of some future income stream.

It is interesting to understand just how significant the level of consumer debt is to economic well-being. Here is a graph that may shed some light on that subject:



This graph plots the rate of unemployment in blue versus an inverted plot of the year-over-year change in household debt (in red). What you can see pretty clearly here is a very high correlation between the two. As the year-over-year change to household debt increases (gets lower because of the inverted plot) the level of unemployment drops, and vice versa. The economist Steve Keen has computed the correlation coefficient for this relationship to be about 0.9 which, for those who are not mathematically inclined, is an extremely high correlation. Professor Keen goes into much more detail regarding the relationship between private sector debt and unemployment and I encourage anyone who is so inclined to look at what he has done. For now, the take-away is that when private sector debt goes up, unemployment goes down, and vice versa. Don't take that to mean that we should encourage ever higher levels of private sector debt because that can't be maintained indefinitely.

When borrowing for investment, a debtor hopes to repay their loan from the profits earned from the investment. Companies also have other means of funding investments, namely issuing bonds or stock. Both bond and stock issues tend to trade away a larger share of venture profits than does the taking of a loan. The advantage of issuing stocks or bonds is that purchasers of those assume a share of the risk that the venture will not be successful. I'm obviously not going to discuss even a small part of the theory of finance. For now let me assert that the role of bank loans for corporate finance is very significant to the economy. When lending dries up for any reason many businesses

(especially smaller ones with insufficient capital reserves to draw upon) may go out of business.

As the population of a society grows, then just to maintain the current standard of living the aggregate wealth must grow at a commensurate rate. To improve the standard of living it must obviously grow even faster. This means that the number and value of economic transactions that occur in an ideal economy is continually growing as well. This requires an ever increasing amount of money (assuming a relatively constant *velocity of money*, which I won't discuss here). Since money is historically the product of debt, this means that the aggregate level of debt must also increase. Who exactly takes on that debt that is very important, as I'll discuss later.

It's critical to understand that the economy depends on credit/debt and that anything that threatens the credit granting process can cause economic problems.

### Section 3: Money and Monetary Transactions

#### *Base Money*

To explain how our money actually works, I need to take a step back and talk about different types of money; how it is created and how it is destroyed. I've sort of danced around this topic so far in this paper, but it's time to clear up the concepts.

The U.S. constitution grants Congress the exclusive right to create money for the United States. In 1913 Congress created the Federal Reserve Bank system and gave it the exclusive right to create what is properly called *base money*. Base money consists of coins and bills that are in circulation plus all deposits recorded in computers at the Federal Reserve Banks. Official measurements of money sometimes refer to this as MB. Actually the Fed prints paper money and the U.S. Treasury mints coins which it sells to the Fed, but that's a nitpick. You will often also hear the term *bank reserves* used. This just refers to the portion of base money that is either on deposit at the Federal Reserve by banks or held within bank vaults as cash. So it excludes the portion of base money that is represented by cash held by the general public and it excludes base money on deposit from non-member-bank entities like governments.

The amount of base money that exists at any given time is completely determined by the operations of the Federal Reserve. They perform *open market operations* to either buy or sell securities (most typically U.S. Treasury bonds, but more recently they have also acquired more private bonds) from member banks. When they buy securities, the accounting on the Fed's balance sheet is:

- A debit to an asset account that represents the increased value associated with the new security owned.
- An offsetting credit to an account that represents a liability for the increase to the bank's reserve account at the Fed (this particular part of the accounting will get much more attention later).

The accounting on the bank's balance sheet would be:

- A debit to an asset account that represents their account at the Fed.
- A credit to an asset account for the value of the security that they no longer own.

The money put into the bank's reserve account for this purchase comes from nowhere (it's basically just created by computer). The Fed's balance sheet expands by virtue of increases to both sides of it (i.e. assets and liabilities).

Conversely, when the Fed sells a security, they subtract the amount of the sale from the bank's reserve account at the Fed and the total level of base money is decreased. The money taken out of the security purchaser's reserve account when a security is sold just disappears. On the Fed's balance sheet its assets are reduced (credited) by the value of the security that was sold and its liabilities are reduced (debited) by the same amount to reflect the decrease in deposits at the Fed. The Fed's balance sheet shrinks as a result.

The Fed can also increase the aggregate level of base money by lending to a bank. When a bank borrows new base money from the Fed, the Fed's balance sheet is debited to reflect the new loan asset and a liability account is credited to reflect the increase in liability for the change to the bank's reserve account. This is exactly how any other bank would account for a new customer loan, as I'll describe shortly. I'm going to come back to the use of this accounting practice as it applies to the Fed later on, because I think that it is incorrect and at the heart of much misunderstanding of the nature of our money.

The Fed issues cash (notes and coins) to banks as requested to satisfy their customers' demands. The immediate accounting for the bank when they receive new cash from the Fed is simply to change the nature of their reserves from a deposit at the Fed to vault cash. So the level of bank reserves does not change as a result of getting cash. Further accounting is done as appropriate when customers withdraw the cash.

The total level of base money is therefore completely determined by Fed transactions. As we'll see, there are some constraints on those actions that derive from the Fed's mandate to assure the smooth functioning of the banking system, but otherwise the Fed is free to pursue independent monetary policy by deciding what sorts of transactions to undertake.

### *Broad Money and Banking Transactions*

Base money is only a small fraction of all money in circulation. There are other forms of U.S. money, but all are denominated in dollars and used in exactly the same way to satisfy debts. Most people never know or care about the difference between base money and other broad forms of money. Banks create money whenever they issue a new loan. Lending is conceptually a bit tricky to understand and different economic schools have different ways of describing how this works. Rather than use any of those stories I want to walk you through the steps of the process so that you understand what transactions actually take place and what constraints are placed on a bank's ability to make a loan. After that, you can decide for yourself which story best captures the reality.

First off, you need to understand that all transactions between banks are ultimately settled using base money. The Federal Reserve system was designed primarily to act as a clearing house for all inter-bank transactions. For example, when a check is drawn on an account at bank A and deposited at bank B, here is what happens:

- Nothing immediately happens when a check is written or given to someone because no bank is even aware of the process (not quite true today for checks that the bank sends on your behalf if you do on-line banking, but we'll ignore that).
- When the check is deposited at bank B, the bank will submit the check through the Federal Reserve System for payment from Bank A.
- In reality multiple transactions between banks are aggregated, but for explanatory purposes let's assume that this check represents the only transaction between these two banks.

- Bank A's reserve account at the Federal Reserve Bank will be decreased by the amount of the check (a credit to an asset account on Bank A's balance sheet).
- Bank A will then decrease the check-writer's account (a debit to a liability account on Bank A's balance sheet which balances the debits and credits for this transaction for Bank A).
- Bank B's reserve account at the Federal Reserve Bank will be increased by the amount of the check (a debit to an asset account on Bank B's balance sheet).
- Bank B will then increase the check-depositor's account (a credit to a liability account on Bank B's balance sheet which now balances the debits and credits of the transaction for Bank B).

When a bank gains a new deposit, it gets an increase in base money (either vault cash if the deposit was cash or in its reserve account at the fed if the deposit was via a check or other form of inter-bank transfer). Deposit accounts are considered to be bank liabilities because if the owner decides to withdraw some or all of it later, the bank is liable for the base money needed to cover the withdrawal (either vault cash if the withdrawal is in cash or base money from its reserve account at the Fed if the withdrawal was via check). One thing to keep in mind for a discussion that we'll have shortly is that accounts that track liabilities are supposed to represent a real world liability, that is something of substance that the bank must come up with to satisfy some contractual agreement. In this case, that substance is base money.

All that seems pretty straight-forward I hope, but there is a bit more to say about this. If Bank A does not have enough base money in its account at the Fed to clear the check, then it must borrow the needed base money, either from another bank which has more than it needs or directly from the Federal Reserve, which creates new base money to accommodate that need. One of the primary objectives of the Federal Reserve system is to assure the smooth clearing of transactions between banks. Providing additional liquidity (base money) whenever a bank needs it is completely consistent with that objective. The Fed will charge an interest rate for these additional reserves, so there is a definite cost to the bank if it does not have enough.

I want to emphasize again that from a bank accounting point of view, customer deposit balances represent liabilities. When a deposit is made, a bank records an increase in assets (the base money deposited) and an equal increase in liabilities (for the increase in the customers account). We would say that the bank's balance sheet grows as a result of deposits and shrinks when money is withdrawn.

Now remember that I said the the total level of base money is completely determined by Federal Reserve transactions. In theory, it is completely within the Fed's power to decrease the amount of base money to a point where banks in aggregate are short of the amount needed to clear all transactions. But then the Fed would find itself compelled by its own charter to loan out new base money to supply the needed liquidity, thereby increasing the amount of base money in existence. In practice, the Fed tries to assure that there is sufficient base money in the system to clear normal transactions.

Next let's take a look at what happens if a bank buys something from a non-bank. Generally, a bank's monetary assets are in the form of base money and when it spends those (say to buy some stock or bond), here is what happens:

- The bank initially purchases an item and debits an asset account for the value of the asset that was acquired and credits a liability account for the debt owed to the seller.
- The bank issues a check to the seller.
- When the seller deposits the check (say at a second bank B) Bank B will submit the check for payment through the Federal Reserve system.
- Bank A's reserve account at the Fed will be decreased (on Bank A's balance sheet a credit to their Fed base money account and a debit to the liability account to reflect the paid debt).
- Bank B's reserve account at the Fed will be increased and bank B will increase the balance in the check depositor's account (on Bank B's balance sheet there will be a debit to their Fed base money account and a credit to the customer's deposit account to represent the bank's liability for the deposit).

But look what happened as a side-effect of this process. A new deposit was created at Bank B that actually increased the level of the broad money supply as measured by M1, M2, M3, or MZM. If a bank were to sell something to a non-bank, the opposite happens and the broad money supply will shrink.

This is really only important to understand when thinking about how government bonds are bought and sold and banks act as intermediaries who either buy a bond from the Fed and sell it to the general public or buy a bond from the general public which they sell to the Fed. The former reduces the supply of broad money and the latter increases it. In this way, the Fed can conduct *open market operations* which buy or sell bonds to banks, which in turn buy or sell to the general public and effect a simultaneous change in the level of both broad and base-money measures. Of course if the bank was the original holder of a bond that is sold to the Fed or holds on to a bond purchased from the Fed, then there is only a change in the amount of base money in existence and broader measures of money would not change at all.

Now let's take a look at what happens when bank A makes a loan to borrower B. This is a somewhat more interesting case.

- Bank A gets a loan note from B which stipulates the face value of the loan plus the terms of repayment (amounts and dates) and books that as a new asset (debits the appropriate asset account).
- Bank A increases B's account at the bank by the face value of the loan and books that as an increase (credit) in deposit liabilities.

And that's all that really happens at the immediate time that a loan is issued. But look what has happened. The bank was able to unilaterally expand its balance sheet by the amount of the loan. It got a new asset in the form of the borrower's note and a corresponding new liability in the form of the increase in the borrower's account balance. The total amount of money in the bank's deposit accounts has increased by the amount of the loan. Most other broader measures of money (e.g. M1, M2, M3, and



MZM) include these deposits in their total. Therefore the total money supply, as counted by those measures, has grown by virtue of the lending process.

When a loan is repaid, the following occurs:

- Bank A gets a payment from B (say by check)
- When that payment clears, Bank A's reserve account at the Federal Reserve will have increased by the amount of the payment.
- The reserve account of the bank where the check was issued will have decreased by the amount of the check.
- The borrower's account at the bank where the payment check was drawn will have decreased by the amount of the check.

In the same way that the lending process resulted in an expansion of the bank's balance sheet, a loan payment will shrink it by the amount of the loan principle that was repaid. The interest part of the payment represents income, so the balance sheet will grow by the amount of interest paid since that represents income for the bank. (if you want more accounting detail here, let me know and I'll generate something for you). Also, in the same way that the lending process increased the level of aggregate customer deposits, this process results in a decrease in aggregate customer deposits. There was also a transfer of base money between banks because of the way I constructed the example, but the total aggregate level of base money remained unchanged, as it must. So you can see from this description that loans increase broad measures of the money supply and loan payments decrease such measures. The level of debt directly drives the amount of broad money in circulation.

### *Constraints on the Amount of Bank Loans*

Now on the face of it that might seem like there are no constraints whatsoever on how much money banks can create and loan out, but I haven't told you the whole story yet. There are two sorts of regulations that banks face which constrain how much lending they can do. The first regulation is called the *reserve requirement*. This is a regulation that mandates a required minimum ratio between the amount deposited in the bank's reserve account at the Federal Reserve and the amount held in checkable deposits by the bank's depositors. For U.S. banks that ratio is 10% (actually it varies a bit depending on the size of the bank, but 10% is close enough for this discussion). So when a bank makes a loan and creates a deposit, its reserve requirement goes up by 10% of the value of the loan.

There are several things you should be aware of here. The first is that banks do not have to immediately satisfy a new reserve requirement. The truth is that new deposits are constantly being made which increase the reserve requirement and withdrawals are made which reduce the reserve requirement. The regulations require banks to maintain an average balance that matches their actual requirements and they have 14 days to make up any shortfall. Remember that all this must be base money, since that's the only thing that is ever deposited in Federal Reserve accounts. So if a bank is short of the needed reserve balance in its (base money) account at the Federal Reserve, then the

Fed is obligated to lend them enough to make up the difference. This is similar to its obligation to lend new base money when needed to clear transactions. When a bank requires such a loan it is charged interest, so this imposes an additional cost on the bank. But for all practical purposes reserve requirements place no absolute constraint on the amount that can be loaned. In theory of course, the Fed could reduce the level of base money enough and raise the interest rate charged for borrowed reserves enough, that the cost of issuing a loan could be made prohibitive. Presumably there would never be a reason for the Fed to do this, but clearly the power to do so exists.

There is a second and more serious regulatory constraint on the amount of lending that banks can do which is called a *capital constraint*. There is a set of international standards called the *Basel Accords* which was developed at the Bank of International Settlements (BIS) and which defines an appropriate ratio between a bank's risk-weighted capital asset holdings and its outstanding loan portfolio. The idea is to assure that the bank always has enough assets available to cover checks written on its accounts even in the face of some percentage of defaults by its borrowers. Since all inter-bank settlements require base money, it would first be necessary to convert those assets into base money. The ease with which this can be accomplished is referred to as the *degree of liquidity* of an asset. Not all assets are equally liquid; some can be more easily sold to increase the bank's reserve account than can others and the computed capital ratio takes that into account. Each country independently implements Basel recommendations as it chooses. If a bank falls below this regulatory limit, then bank regulators will require it to immediately raise more capital or reduce the level of its outstanding loan portfolio to come back into compliance with the regulation. In extreme cases, regulators may declare the bank insolvent and arrange to have its assets sold to other banks.

### *Characterizations of Bank Lending*

Note that when a loan is made, no other depositor's account at the bank is affected, so it's not really correct to say that the bank loaned out money that someone else deposited. In the example I provided earlier, Bank A's reserve account at the Federal Reserve was not affected in any way by issuing a loan, so it's not really correct to characterize the loan process as "loaning out bank reserves". But if you read descriptions of the bank lending process in various economic texts you will see one or both of those characterizations used to describe it. In truth, the amount that was credited to B's account when the loan was made did not "come from" anywhere. So in my estimation economists who make the statement that banks create deposits "out of thin air" as part of the lending process are most correctly characterizing what happens.

When a loaned amount is used and deposited elsewhere, the settlement of that transfer results in the transfer of base money out of the lending bank's account at the Fed and into another bank's Fed account. It is likely that the notion that banks lend reserves derives from this observation. However, let's consider a small-town bank where every person and business in town deposits their money. Then the bank could issue a loan that was used to procure goods or services from a business, which would deposit that

money right back into the same bank. Everyone is happy and actual economic transactions took place, but there was no change at any time in the level of the bank's reserve deposits at the Fed. So it's a little hard to think about that process as one of loaning out reserves.

Now I can hear some of you thinking "that's all well and good for small town banks, but the modern reality is that most money will actually change banks, so it's much more correct to think about loans as the lending of reserves". So let's think about that. Modern banking is characterized by a handful of very large banks that have branches everywhere. One of the consequences of this is that a large fraction of the transactions that occur will take place entirely between branch banks in the same system. For those transactions, there will also be no impact on the bank reserves held at the Federal Reserve. And for the transactions that do occur between these large branches, only the *net* difference in flows will impact the reserve balances of the two banks. So the majority of loans and the uses of that money will result in no net impact to the reserve balances of the banks involved.

It's also true that deposits are nice to have because, as we have seen, deposited money increases the amount in the bank's reserve account at the Fed. It is likely this observation that causes people to think about loans as using deposits. This is consistent with an economic model called the *Loanable Funds Model*, which is a theoretical description of a market for funds where savers (people who have money that they do not currently want to spend) supply money to borrowers (people who want to spend money now, but don't have it). Banks, in this model, act merely as intermediaries in this exchange. They pay interest to savers and collect interest from borrowers and the difference represents their profit on the exchange.

One of the conclusions drawn by economists who accept this model is that *bank lending doesn't really impact GDP because the lending process just moves money from one person who chooses not to spend it to another one who does*. For example, the Nobel prize-winning New York Times economist, Paul Krugman, has said just this in his blog at times and can't understand why anyone cares so much about what banks do. On the surface that may seem reasonable, but think about what actually happens when a loan occurs. We just got done showing that broad measures of money increase when a loan is issued and shrink when it is repaid. The problem with the loanable funds model is that it assumes the total amount of money is unaffected by loans, when in fact it is quite dynamic and changes with the lending policies of those same banks that they say can be ignored. It's most definitely NOT the case that the amount of money that is lent can be ignored because that process changes the amount of money in circulation.

Now I want to be a bit careful here because it is not just the amount of money that matters. How fast it changes hands, i.e. the *money velocity* is also an important factor in the size of GDP. The economist Steve Keen has some nice equations that represent the impact of both factors on GDP that I won't include here. And the previous graph also demonstrated pretty clearly that the level of debt has a definite inverse relationship to

the level of unemployment, which is obviously inversely related to GDP as well, from which we might infer that debt and GDP are also closely related.

Some people hold to the theory that the Federal Reserve can either stimulate or throttle down the economy based on its ability to control the amount of base money and hence the level of excess reserves. That will supposedly have an effect on how much banks will loan. They believe that there is a relatively fixed relationship between the amount of reserves created by the Fed and the amount of broad money subsequently created by virtue of bank loans. This is sometimes referred to as the *Money Multiplier Model*.

I want to be careful here, because the term *money multiplier* is used in a few different ways. Some use it to refer to the ratio of broad money (typically as measured by M1) to the amount of reserves (MB). Obviously anyone can compute any ratio they want and give it any name they want, so there is nothing controversial about this usage. But you will find many economics textbooks which assume that there is a causal relationship between those two measures of money and describe the process as one where some amount of reserves are initially created by the Federal Reserve and used to purchase bonds from banks, thus supplying them with reserves which they can loan out. The bank then chooses to loan out as much of its reserves as it can, subject to the 10% reserve requirement. That is, they lend out 90% of their reserves. When that money is deposited at another bank, the same process repeats itself, and so on with each bank lending out 90% of what the previous bank did. By adding up all the amounts loaned you can derive a maximum amount of broad money that can (and typically will) be created from an initial deposit of reserve funds.

Sometimes supporters of this model will point to the fact that historically the measured *money multiplier ratio* has been very close to this theoretical maximum. The only trouble with that "proof" is that they got the causality backwards! It is the level of loans that are issued that determines the reserve requirement and banks will then do whatever is necessary to meet that legal requirement *after the fact* and the Federal Reserve is obligated to cooperate with that by creating and lending more reserves if necessary. You might well ask how I can assert that the causality runs in that direction with such certainty. Recent history has provided us with very nice empirical evidence. As part of the quantitative easing (QE) program the Fed has created an enormous amount of reserves. If there were, in fact, a causal relationship between the level of reserves and lending, then banks would be lending like crazy. In fact, the banks have basically ignored the excess reserves that, in aggregate, they are compelled to hold by the Fed's QE program. So we can conclude from this that the *money multiplier model of money creation* bears almost no resemblance to the process that banks actually use. Under normal circumstances where banks have sufficient capital to make loans, the exact level of excess reserves that a bank has on deposit at the Fed plays almost no role in the decision to make a loan. Rather, they look for opportunities to make low-risk loans at the best possible rate of interest and only later do what is necessary to meet legal reserve requirements.

You may also hear banks criticized today for “sitting on all their excess reserves and not loaning them out”. The most obvious rejoinder to such a complaint is that the system-wide total of base money reserves is entirely within the hands of the Federal Reserve. By the QE process it has undertaken, the Fed has dramatically increased the total level of base reserves on deposit. As noted earlier, when the Fed purchases a bond, base money reserves go up by the amount of the purchase. Now it is true that banks can reduce the level of *excess* reserves by issuing a new loan (increasing the *required* reserves by 10% of the amount of the loan). So bank lending can affect where the line between required and excess reserves falls, but it cannot have any effect on the total level of reserves within the system. An individual bank can go out and buy some other sort of asset which requires a transfer from its reserve account into the reserve account of some other bank. This clearly reduces that bank’s total reserves, but the systemwide reserve level remains the same since the base money must always be deposited in one account or another at the Fed.

The bottom line regarding loans is that banks do not directly lend out deposits or reserves. However it is true that the level of reserves helps to satisfy the bank’s capital requirement, so it is in the bank’s best interest to attract deposits. So now if you read in an economics textbook that a bank lends out a portion of its deposits, you should understand that this does not resemble the accounting that occurs in any way. Or if you read that banks are “sitting on their reserves and not lending them out”, you will understand that this is also a mischaracterization of how lending works because the creation of a loan never affects a bank’s total reserve balance (only the line that divides required reserves from excess reserves). Only when money is transferred from one bank to another or when money is withdrawn as cash, does a bank’s reserve balance change. Of course when reserves are moved from one bank to another, the systemwide level of excess reserves does not change in any way.

However you want to think about the lending process is just fine by me, as long as you understand what is really going on behind the curtain.

### *Treasury Transactions*

Now that you understand the difference between base money and broad money and how they get created and destroyed and how Fed transactions completely determine the total level of base money in the Federal Reserve system, let’s take a look at treasury spending and what happens there. The actuality is that these transactions are done via special intermediary banks, so what is below is an overly simplified version of the process. But the net effects are as I describe here. The U.S. Treasury has an account at the Fed just like any bank. When taxes are paid to the government the effect is similar to when a loan is repaid:

- The taxpayer’s account at its bank is reduced by the amount of the tax (a debit to the deposit liability account on the bank’s balance sheet).
- That bank’s account at the Fed is reduced by the same amount (a credit to the reserve asset account on the bank’s balance sheet).

- The Treasury's account at the Fed is increased (a debit to a reserve asset account on Treasury's balance sheet).
- The Treasury's asset account for taxes due is decreased (a credit to a taxes owed asset account on Treasury's balance sheet).
- Broad measures of money would say that the money supply has been decreased by this process.

When the treasury wants to write a check for something, the opposite process occurs:

- The recipient's account at the bank where the check is deposited is increased by the amount of the payment (a credit on the bank's balance sheet for the increase in deposit liability).
- That bank's account at the Fed is increased (a debit on to a reserve asset account on the bank's balance sheet).
- The Treasury's account at the Fed is reduced (a credit to the reserve asset account on Treasury's balance sheet).
- An appropriate Treasury account (an asset account if the check was used to buy something or a liability account if the check was used to pay a debt) is debited.
- Broad measures of money would say that the money supply has been increased by this process.

Under current law, the treasury must have enough money in its Fed account to make such payments. To assure that this is the case, the Treasury will issue debt which is sold via an auction to designated banks and ultimately resold on the public bond market to whoever wishes to buy them. The accounting for a bond sale is simple, but interesting:

- The Treasury's Fed account is increased by the amount of the sale (a debit to an asset account on the Treasury's balance sheet).
- The level of the national debt increases by the amount of the sale (a credit to a liability account on the Treasury's balance sheet).
- The Bank's Fed account is reduced by the amount of the sale (a credit to the bank's reserve account asset on the bank's balance sheet).
- The Bank gains the bond asset which it can dispose of as needed (initially a debit to assets on the bank's balance sheet).

While the total level of reserves is unaffected by this process, the level of reserves that are in bank deposits at the Fed (i.e. what is called the monetary base) is decreased.

Note that even though the monetary base was decreased, this transaction between the Treasury and a bank had no immediate effect on measures of broad money. However, as we noted when we discussed what happens when a bank buys or sells something to the general public, those transactions DO affect broad measures of money. So to the extent that a bank acts merely as an intermediary for Government bond sales and redemptions we can think of these as Treasury transactions as affecting the broad money supply as well as the amount of reserves.

This is probably a good time to point out that the way various people describe economic operations will depend on what transactions are aggregated together. You can do that in different ways to get different net effects. That's why I try to break everything down into individual operations to be clear about what is happening. There is a lot of economic disagreement that occurs simply because the participants are not clear about the precise aggregation of operations that they are discussing.

### *The nature of Fiat Money*

Since 1971, U.S. base money has no longer been convertible into gold or anything else. This is called a *fiat money*. It's important to understand how this is different from convertible money. For money to be useful, it must still have a value, so a reasonable question to ask is what gives our fiat currency any value whatsoever. Some economists (chartalists or modern monetary theorists) will tell you that the government's mandate that taxes be paid in that currency gives it a value. I think that is part of the answer, but not all of it. Federal taxes are a form of debt that citizens owe to the government. So anything that can be presented to the government to extinguish that debt constitutes a form of money, just as we could historically use a bank note to extinguish a debt. So far so good.

But I think that an even greater attribute of our fiat money is the use that the government guarantees in writing on every single dollar-denominated bill that is issued; namely "THIS NOTE IS LEGAL TENDER FOR ALL DEBTS, PUBLIC AND PRIVATE ". So not only is it possible to extinguish a debt to the government (i.e. pay taxes) with this note, it is also possible to extinguish all other private debts by using it. Basically, that is a guarantee that I can convert the money into anything else that is for sale in the economy. Recall that a sale is just a transfer of a good or service which establishes a debt that the buyer has to the seller. I can then use U.S. dollars to satisfy that debt. That provides a method by which the value of the money can be determined (i.e. what can I exchange it for), but does not prescribe a precisely computable value in terms of any other commodity.

### *The value of Fiat Money*

Since 1971 the value of a dollar has been determined dynamically by the prices of goods and services sold within the U.S. economy rather than by some conversion factor to gold. The government goes to great lengths to measure the cost of an average basket of goods so that they can measure changes in prices over time and thereby calculate a rate of inflation.

Inflation is the rate at which the value of a dollar supposedly declines over time. Personally I'm a bit of a skeptic about measured rates of inflation and the real value of a dollar. Perhaps that is because of my close association with computers throughout my lifetime. To me the value of a computer that I can buy for \$500 today is many orders of magnitude greater than the value of a computer that I could buy in 1980 because the real capabilities are so much greater. But the way that the government measures inflation is by looking at the cost of materials and labor used to produce things and not

any sort of measure of intrinsic capability, usefulness or any other attributes that we might associate with "value". I can't blame them for taking that approach, but I can't shake the feeling that everything has improved at a much more dramatic pace over my lifetime than is represented by the cumulative rate of inflation.

People will point to the cost of a haircut today versus what it was some time ago to make the point that something that has changed very little costs so much more today. Therefore the value of the dollar must have decreased accordingly. I would counter by saying that our society is so much richer now because each hour of labor can produce things of much greater intrinsic value. Therefore, in our society, the base rate of each labor hour has gone up accordingly. If haircuts cost what they did 40 years ago, there would be no barbers because no one would sell their labor that cheaply. The labor for a haircut today costs more than it did 40 years ago precisely because that hour is worth more today than it was then. So it isn't so much that the value of a dollar has decreased, but rather that the value of each hour of labor has increased.

I think that everyone around the world has known for a long time that if you want the latest and greatest anything, chances are good that it will be available in the U.S. first. I recognize that this isn't always true and many other countries around the world develop and market very innovative new things, but we're still out in front in many areas. And THAT is what makes the dollar an attractive currency everywhere. Hold a dollar for a few years and it is likely that you can use it to buy something that didn't even exist when you first obtained it. And I don't care what the official inflation rate tells you about what it is worth. Many pundits are dumbfounded by the current strength of the U.S. bond market because with the current rate of inflation and the rate you can earn on bonds, you can compute that you are effectively paying the government to hold your money for you. But I think this ignores what many people know instinctively, that the dollar is safe and gaining value over time at a rate that exceeds the loss computed by considering official measures of inflation.

### *Unconvertible Implications*

Next it is important to understand the implications of no longer guaranteeing conversion of dollars to a fixed commodity such as gold. When there was such a guaranteed conversion, governments had to consider how much gold they had available and constrain how much currency they produced because each bill produced represented a debt of gold that the government could be required to pay. That is precisely why the creation of every new dollar by the Federal Reserve was accounted for as an increase of both assets and liabilities. The Fed had a real liability (namely to provide gold) for each dollar. That is also why the Fed purchased gold-certificate assets; i.e. as an offset to its very real liability for gold that went with every dollar it printed.

### *Why Fed Accounting is Wrong and What it Should be*

When there is no longer an explicit conversion debt associated with the money, then in what sense does the creation of new fiat money represent debt at all? Some people (including Federal Reserve documents that talk about it) say that in some sense it is no



longer a debt of the government, but rather a debt of the economy as a whole, in the sense that the value is determined by what can be purchased. It is the strength of the economy that makes it possible for the government to issue new dollars. Although all that is true, I still find it difficult to talk of the money that is created by the Fed as any sort of debt owed by the Fed itself. What we also have to keep in mind is that as we have seen, the strength of the economy is in many ways determined by how many dollars are being spent. So there is a symbiosis between the amount of money in circulation and the rate of economic growth. I'll come back to other implications of that in just a bit. But if this is the case, then why does the Fed still book a liability for each dollar created? Surely there is no actual Fed liability.

The question an accountant would ask me at this point is "If it isn't a liability, then what exactly should the offset to the creation of the dollar asset be?" It's a truism in economics that for every financial asset there exists a complementary liability. Double-entry bookkeeping demands that there be such an offset. And since base money is a financial asset must there not be an associated liability? When thinking about this the conclusion that I finally came to startled me. Namely, *base money isn't really a financial asset*; it is better thought of as a *real* asset, just like gold or any physical commodity. After all, the value of base money is completely determined by its own properties and there is no guaranteed conversion of it into anything else. If you want to think of it as something that is mined by the Fed, I'm ok with that.

I think there are actually two possible ways to look at what the accounting should be. Let's start by going back to some accounting basics. There is an equation that must always be kept in balance for any balance sheet:

$$\text{Assets} = \text{Liabilities} + \text{Capital Equity}.$$

So when a company is first capitalized, say by selling stock, there is an increase in assets (the money received for the stock) and an equal increase in capital equity (representing the stock owned by investors) and the equation stays in balance. When a company makes a profit, it will result in an increase in assets and an increase in capital equity in the amount of the retained profit; again keeping the equation in balance. There are two ways that we can look at the creation of new dollars; either of which make more sense to me than thinking of them as creating a liability.

First, since any dollars created by the Fed are official base dollars, their creation can be looked at as an additional capitalization of the Federal Reserve and be booked as an increase in capital equity by that amount.

When the Fed started doing Quantitative Easing, some commentators worried about what might happen if the Fed's liabilities got very large relative to the actual value of the assets it was procuring with the new money. Basically the Fed was buying junk assets at values that were quite favorable to the banks, so if those assets were later "marked to market value" the Fed would in effect take losses on those transactions that might result in a negative net worth. Surely if any normal bank did that they would be in big trouble. But it was quickly pointed out by many that the Fed could continue operating indefinitely while in this situation. There was no practical ramification. The Fed's net worth was in

no way a deterrent to its ability to create new money. In this respect it is very different from a normal bank that would not be able to create new money (issue a loan) if it had a net negative capital equity.

The reason that this is not a problem for the Fed is simply the fact they can print new money without creating any actual liability at the same time. What is currently booked as a liability is not, in fact, any sort of actual liability, but rather an increase in capital equity. Under this interpretation, the Fed would be considered to be self-capitalizing. They have no need to get capital from anywhere else because they have the power to create it themselves at any time. That does not mean that there are no economic consequences to creating new capital, but we'll come back to those later.

The second way of thinking about the creation of new money is by considering it to be produced by the Fed, just as any company produces any other real product. Since the cost of that production is effectively zero, new money could be completely offset by a retained profit (which adds to capital equity by the same amount). We basically end up in the same place on the balance sheet that we did before with an increase in capital equity rather than an increase in the Fed's liabilities as results from current practices.

You might ask why I am making such a big deal about how the accounting is done. That answer becomes clear when you consider the fact that at the end of each year, any "excess" profit earned by the Federal Reserve is turned over to the U.S. Treasury. So if new money creation was booked as a profit, then at the end of the year that profit would be turned over to the Treasury. Of course, you have to be careful to do the accounting correctly here. This is done by reducing both the sides of the Fed's balance sheet (shrinking it) and increasing both sides of the Treasury's balance sheet (growing it). If the Fed has spent most of the money they created, then there won't be any cash assets to turn over to the Treasury. But assuming that they used the new money to purchase financial assets, then they will have a bunch of those assets, including a large amount of Treasury bonds which they could turn over to the Treasury, basically extinguishing that debt and reducing the national debt.

The way of accounting that I'm suggesting opens up another way of funding the Treasury altogether. The Fed can create new money, in any desired amount, booking it as an asset increase in the form of base money and an increase in capital equity (profits) and then directly refund that amount to the Treasury at the end of each year. The Treasury would then have funds to spend and not have to ever issue debt in the first place! Technically, the Fed would not be violating its mandate to avoid direct purchases of Treasury debt.

This whole notion is consistent with the thinking of Modern Monetary Theorists who also hold that it is never necessary for a fiat-money issuing government to obtain money in order to spend it. They would say that it is only the laws passed by Congress in the U.S. that makes debt issuance a legal requirement. All I've done is point out that the whole problem in the way we currently think about national debt derives from a simple

accounting error. There is no real liability to the Fed for money that it creates and if we accounted for it properly, all sorts of interesting possibilities are opened up.

I should say parenthetically that I don't really blame the government's accountants for not changing the accounting practice in 1971. Richard Nixon made a unilateral decision and nobody really knew whether that decision might be changed back at some future time. So it would have been irresponsible to book a sudden windfall profit (i.e. an increase in capital equity) corresponding to the instantaneous extinguishing of the Federal Reserve's gold liability for the money that had been printed. However, I think enough time has passed, that we should take another look at the accounting and get it right. Then we can talk about how we might better fund treasury spending.

### *Money Creation Summary*

Let's summarize how new money comes into existence and goes out of existence because it's critically important to understand the various options.

- New base money is created by the Federal Reserve when it either buys some financial asset from a bank or makes a loan to a bank.
- Base money is destroyed either when the Federal Reserve sells some financial asset to a bank or a base money loan from the Federal Reserve to a bank is repaid.
- Broad money is created when a bank issues a new loan or buys a financial asset from a private party or when the treasury spends money.
- Broad money is destroyed when a bank loan is repaid or a bank sells a financial asset to a private party or when the treasury collects taxes.

## Section 4: Money Movement Across Sectors

### *Sectors and Their Roles in the Economy*

To my way of thinking, sector analysis is one of the most important tools that can be employed to understand economic fundamentals. I've written about this before, but I want to review it again here because it will form the backdrop for the discussion about the nature of our national debt that will be the subject of a later section.

The basic idea is pretty simple. You divide up the whole world into groups of people and then analyze the movement of money between groups rather than between each separate set of individuals. There are obviously a very large number of different ways we could do this. I'm going to start with a very common breakdown of the world into three sectors:

- Public
- Private
- Foreign

And then for some discussions I'm going going to break down the private sector into additional sectors in a very typical way too; specifically:

- Household
- Business
  - Financial Business
  - Non-Financial Business

### *The Inter-Sector Money Flow Constraint*

The discussion below is a somewhat condensed version of what I wrote in a previous post that you can find at

[http://bigw.org/~pkrueger/pl/CivilDiscourse/Entries/2012/2/1\\_Sector\\_Analysis.html](http://bigw.org/~pkrueger/pl/CivilDiscourse/Entries/2012/2/1_Sector_Analysis.html).

So please read that if you want a bit more detail.

Much of what is below is adapted from the blog written by Australian economist Bill Mitchell: <http://bilbo.economicoutlook.net/blog/?p=9198>.

Here's a dictionary (alphabetical order to make it easy to look up a term) that defines all the terms used in the equations below. Bear in mind that each of these represents a *flow of money* over a given period of time and not a pool of money that grows and shrinks over time. We'll talk about those too, but that's NOT what is represented by these variables. Typically we'll measure and talk about these flows as they occur over a month, a quarter or a year, but they can be measured for any reasonable time increment. Hopefully this will make things easy to read:

- C = Consumption
  - The total amount of money spent by private sector agents to buy goods and services in the U.S. economy
- G = Government Spending
  - The amount that the U.S. government spends to purchase goods and services in the U.S. economy.

- GDP = Gross Domestic Product
  - The dollar value of the total amount of goods and services produced within the U.S. economy.
- I = Investment
  - The amount that is spent to acquire or update capital goods that are used to produce future earnings of some sort.
  - Some sorts of relatively permanent things that consumers buy (e.g. homes) are also considered to be investments.
  - Purchases of stocks and bonds by consumers are NOT considered to be investment (see Saving).
- M = iMports
  - The total amount of goods and services produced outside the U.S. economy, but purchased by U.S. consumers
- S = Savings
  - The amount that private sector agents use to purchase financial assets like stocks, bonds, savings accounts, etc. which can be reconverted into cash and spent at some future time.
  - Any income to an agent that is not otherwise disposed of during the period over which these flows are measured is considered to be saved. So any money left in a checking account or in cash is also part of savings. If that money is spent in a subsequent period, it is treated as a form of negative savings.
  - This value is *net of new liabilities*, i.e. any new debt that is created in the private sector is subtracted from the total amount used to purchase these assets. If you like, you can think of the process of increasing debt as a sort of negative saving.
  - Conversely, when debt is paid off, it is then considered to be a form of saving. If you like, you can think about this as buying back your own loan note, which has the side effect of canceling out your debt.
  - When financial assets are sold, that is also a form of negative saving which adds to income. So if a person sells off one financial asset and uses the money to acquire some other financial asset, the net effect on the savings flow is zero.
  - For the economy as a whole all these factors are summed for all economic agents in the private sector.
- T = Taxes
  - The net amount that the Federal government receives from the private sector as payment for taxes and fees of various sorts less any transfer payments from the Federal government to the private sector.
- X = eXports
  - The total amount of goods and services produced inside the U.S. economy and purchased by foreign consumers.

If you can understand and remember what these eight variables mean, you've got it made.

The approach I'm going to take is to consider two completely standard equations that describe how to compute GDP in different ways and equate them to each other. As a consequence of that we can derive some interesting relationships between these

variables and after a short explanation I'm hoping that those will become as obvious and intuitive to you as they seem to me. It will help you think about the dynamics of debt and money movement throughout the economy.

The two equations for GDP that we'll use basically count up economic activity in two different ways. The first sums up all money that is spent to purchase things in the economy, that is, all the sources of economic income:

$$\text{GDP} = C + I + G + (X - M)$$

which says that total national income (GDP) is the sum of total final consumption spending (C), total private investment (I), total government spending (G) and net exports (X - M).

Fundamentally this says that there are four sources of money that are used to buy things produced within the U.S.: consumption, investment, government spending, and net exports. Let's look at each of these.

Consumption (C) is what the private sector spends out of income; things like food and clothes and cars, etc. Home purchases are actually considered investments (I) rather than consumption because they can be sold later and either appreciate or depreciate in value.

Investment (I) is the amount that businesses spend on things that will be used to produce products, plus homes that households purchase. This does NOT include money that households use to buy things like stocks and bonds. So make sure you understand that the term is different than the usual sense that we use when we say that we "invested in the XYZ stock". We'll see below that this sort of "investment" is actually categorized as saving. So only dollars spent by a company to buy something or spent by a person to buy a home are counted as part of investment for this equation.

Government spending (G) includes all spending to purchase goods and services from the private sector. So it doesn't include government spending for things like social security, unemployment compensation, or other so-called transfer payments nor does it include interest expense on the government debt. The computation of G does not depend in any way on how that spending is financed.

The last term (X - M) is the net difference between what was exported (X) and what was imported (M). You might think that this should just include exports, but consider the following. Often businesses buy materials from abroad and use them to make new products that are exported. So if we just used the value of the exports we would effectively include the value of all those imported goods into our GDP. Since that would not accurately reflect the real value of what we produce, it makes sense to reduce that amount by the amount of imports.

OK, so that is the first way of computing GDP, by adding up how much money is spent to purchase things (all income sources). The second way (also standard and uncontroversial) is by looking at how the money from all financial transactions is used (i.e. all income destinations):

From the uses perspective, national income (GDP) can be used for:

$$\text{GDP} = C + S + T$$

which says that GDP (income) ultimately comes back to private sector agents (households or companies) who consume (C), save (S) or pay taxes (T) with it once all the distributions are made.

You have to be a little careful about how this is interpreted. When I see others criticize this approach it often stems from a misunderstanding of the variables in this equation. You'd assume that anyone writing an economic blog would understand something this standard, but clearly there is some confusion even among those who are economically well educated. And the economists who do understand this correctly often take for granted that everyone understands what the variables are and don't explain them as well as they should. I know that these simple little equations had me going in circles for quite a while before I finally figured out exactly what each of these terms meant. Hopefully I can save you some of that pain.

What this equation says is that either individual income or net income to companies can be used in one of these three ways: to buy things to consume, to pay taxes, or to put away in savings. Let's look at those one by one.

Consumption (C) is exactly the same as it was in the first equation. If you think about this, it makes some sort of sense. Consumption provides money to companies (so it's a source of spending) and also represents how it is used, namely for things that are purchased and used up.

Taxes (T) are pretty obvious and easy to count as well. Tax payments are net transfers of money from households or companies to the government. Taxes, which obviously flow from the private sector to the government, are offset by transfer payments made from the government to individuals. Together these flows regulate how much of income remains available to the private sector for saving and consumption.

Where some difficulty can arise, I think, is with savings (S). There is a tendency to think that the term "savings" means something like "the sum of all financial assets held by individuals and companies". And indeed, economists will often use the term "savings" to describe that amount. For now, let's call that sum the "private sector savings pool" to distinguish it from the S term in this equation. In the equations above S represents an incremental flow of money into that private sector savings pool during some time period; it is not the value of the whole pool itself. I'll explain in just a bit why that distinction is important.

It's also important to understand how loans factor into the computation of the S term. When a private bank makes a loan to a company or individual, this creates new dollars which, prior to reading this paper, might have come as something of a shock to those of you who thought that banks lent out money that they got from depositors. Borrowed money can be used for consumption or investment or put into savings or used to pay taxes, so it should be obvious that loans affect the value of other terms in the GDP equations.

To make sure that the two equations measure GDP in the same way, the S term must represent the flow of money into the private sector savings pool net of new liabilities created by loans. If you like, you can think of a new loan liability as a form of negative saving because that's the way it is accounted for. For example, if a person borrowed \$100, spent \$50 and put \$50 into a savings account, the net savings would be -\$50 (-\$100 for the loan liability + \$50 for the addition to savings) and that is what would be added to the S term. The \$50 spent would show up as an increase in the C term in both equations. Since that \$50 of spending is also used somehow, it will also show up as an increase in the S, C, or T terms, so everything stays in balance. If that example is too confusing, forget it and just remember that the S term is net of new loan liabilities.

When a loan is paid off, it is accounted for as a form of saving. That seems fair since the original loan liability was considered a form of negative saving. What occurred immediately following the great recession in the private economy was "saving" by virtue of paying off the large amount of debt that was accumulated during the mortgage boom years. So if you see an economic report that says that the rate of saving is way up in the U.S., it's likely that a substantial percentage of that is actually payments on loans rather than stashing more money into savings.

As mentioned above when we talked about what is considered to be an investment, purchases of stocks or bonds or any other financial instruments are all considered a form of savings and included in the computation of the S term. Only purchases of real goods and services in the economy are added into the I term. I think it will be extremely useful in later discussions to think about savings as purchases made in a financial instruments market that is separate from all other private sector markets. Right now, that may help you remember the difference between saving (which represents purchases in the financial assets market), consumption (which represents purchases in the consumer goods and services market), and investment (which represents purchases in capital goods markets). Government spending, G, can represent purchases in any market.

Now if we equate these two equations for GDP, we get:

$$C + S + T = C + I + G + (X - M)$$

Since the two equations represent the same thing they should be equal to each other.



This can be simplified by canceling out the C from both sides and re-arranging (shifting things around but still satisfying the rules of algebra) into what we can call the sectoral balances view of the national accounts.

$$(I - S) + (G - T) + (X - M) = 0$$

That is the three balances have to sum to zero.

### *Movement In and Out of Sector Savings Pools*

In the following we will use the terms *deficit* and *surplus* with respect to the point of view of the economy of focus, as has been the historical practice. When the private domestic balance  $(I - S)$  is positive we will say that it is in *deficit* and will say it is in *surplus* if it is negative. This is a surplus or deficit with respect to the movement of money into or out of the private sector savings pool. Similarly, if the budget deficit  $(G - T)$  is positive we will say that it is in deficit and if it is negative we will say that it is in surplus. We will also look at the foreign sector, but from the perspective of its relationship to the U.S. The term  $(X - M)$  is referred to as the Current Account balance and if it is positive it is in surplus and if it is negative it is in deficit. So whereas we considered flows into the first pool to be surpluses, we consider a flow into the foreign pool to be a deficit because it represents a flow away from the two U.S. pools. We do this not to be confusing, but rather to conform to the way that economists have traditionally used those terms.

These balances are usually expressed as a per cent of GDP but that doesn't alter the accounting rules that they sum to zero, it just means the balance to GDP ratio terms sum to zero.

Let's now think about a pool of money that is available within each sector and consider how money flows into and out of each pool. First we'll think about how money gets into any of the pools in the first place. Where does it come from? As we've previously discussed, it comes from one of two places. Base money is created by the Federal Reserve and either loaned to some bank or used to purchase some financial asset from a bank. In either case new money becomes available. The second source of money is bank lending. When banks issue a loan, they create new broad forms of money that is then available for exchange in the economy. Since all financial assets are a representation of a debt somewhere, we can conclude that it is debt, in one form or another, that is the ultimate source of new money.

As the economy grows (assuming money velocity is relatively constant), more money is needed to support all of the financial transactions that must occur. Therefore, the overall level of debt MUST grow proportionately if we are to avoid an across-the-board reduction in prices (since price deflation is the only way to make a fixed amount of money go further when money velocity is constant). The questions we'll want to answer include what sort of debt is the best to have and what keeps the whole thing from imploding as the debt gets bigger and bigger. I'll come back to those at the end of this section.

The government's pool is fairly straightforward. Money flows into that pool as taxes,  $T$ , are collected (net of transfer payments) and flows out as the government spends money,  $G$ . So the net flow out of the government's pool is  $(G - T)$ . I hope it is obvious that if that is a negative amount, it then represents a net flow into the pool. Of course, when the government runs a deficit (i.e. spending exceeds tax revenue) it goes into debt in the amount of the difference which adds money to the pool so as to keep its level constant.

The foreign sector is equally simple. Money flows into the foreign sector pool when the U.S. imports goods,  $M$ , from the foreign sector and flows out of that pool when U.S. exports,  $X$ , are purchased by foreigners. So the net flow out of the foreign pool is  $(X - M)$ , where again a negative number represents a net flow into that pool. Foreigners can also go into debt to obtain U.S. dollars if they so choose, which increases the level of their pool.

The private sector pool is a bit harder to think about for me because there seems to be more going on. You can think of this pool as money that is held by economic agents within the private sector. All money that flows into the economy comes back to private sector agents as income. To think about the net impact on the private sector savings pool it helps me to imagine that all income flows into that pool and all spending flows out of it. We saw from the equation for GDP:

$$GDP = C + T + S$$

that all income can be thought of as the sum on the right side, so let's assume that's what goes into the savings pool. As private sector agents pay taxes,  $T$  comes out. As they purchase goods and services for consumption,  $C$  comes out. So as far as the savings pool is concerned the net effect on the pool from those two activities is zero and  $S$  (what is left of income) represents the flow into the pool. But private sector agents also make investments,  $I$ , which takes money out of the pool, so the net flow out of the private sector pool is  $(I - S)$ . Once again, a negative value for that would mean that there is a net flow into that pool. The private sector can also go into debt if needed when in aggregate it desires to invest more than it saves and the pool level drops too low.

I hope it is obvious that what flows out of one sector must flow into another sector, money doesn't just disappear. There are any number of mathematically equivalent ways of specifying that restriction, but the equation we derived above, namely

$$(I - S) + (G - T) + (X - M) = 0$$

is one of those. If we read this literally, it says that the money flowing out of the private sector pool plus the money flowing out of the government pool plus the money flowing out of the foreign sector pool must equal zero. Obviously if any of these terms is positive, then at least one of the others must be negative to make the sum 0. And if any term is negative, then at least one of the others must be positive for the same reason.

This lets us do some basic reasoning very quickly. If somebody tells you that the government should be running a surplus ( $G - T < 0$ ) and acknowledges that we'll still be exporting less than we import ( $X - M < 0$ ), then you can immediately conclude that if

both those objectives are realized, then it must also be the case that  $I - S > 0$ , which means that the pool of private sector net financial assets must be shrinking. So you should ask that person how much of their personal savings they are willing to give up to achieve his objective. Given that it is extremely likely that we will continue to have a current account deficit (meaning that  $X - M < 0$ ), then if you want the private sector to be able to increase their pool of net financial assets (i.e. save more than they spend overall), then the government MUST run a deficit. The accounting never lies.

Now we should be careful about reading too much into this equation. It states a relationship that must hold over any time period, but you cannot conclude, for example, that if we just invested less, then the overall private sector pool would increase in size. Why not? After all, if we just decrease  $I$  then it seems natural that the  $I - S$  term (which you will recall represents the outflow from the private sector pool) would decrease as well. But that's not necessarily the case! The problem is that these terms are not independent of each other. If you change one of them, then some of the others will change as well. Investment,  $I$ , may cause production to be more efficient, so that more goods can be produced at cheaper prices. That means that consumers can spend less to get the same things they did previously. Conversely, when investment is less, the prices of goods are generally higher than they would have been with a greater level of investment and consumers might have to spend more of their income to get the same basket of goods. To fund that spending increase, they might choose to save less. So just by reducing  $I$ , we could not conclude that the  $I - S$  term would also be reduced. Knowing the equation doesn't absolve us from the responsibility of understanding the interactive effects between the transactions represented by each term.

Note that you can algebraically rearrange the formula above into a form that I find more useful:

$$(G - T) = (S - I) + (M - X)$$

which says that the money flowing out of the government pool equals the money flowing into the private sector pool plus the money flowing into the foreign sector pool. This is a bit more useful simply because the *normal* operation of the economy is for the government to run a deficit, the private sector to be net savers of money, and for our imports to exceed exports which makes the foreign sector a net saver of dollars as well.

This is a really powerful conceptualization of the economy to keep in mind. For example, think about what would have to happen if we decided we wanted to reduce government debt. Reducing that debt basically means increasing the level of the government pool. Assuming that we have kept the level of the pool zero by issuing just enough debt to cover deficits (as is required by current law), that means that the government would have to run a surplus.

What are the consequences of that for other sectors? Let's first assume that we decide to reduce government spending,  $G$ . First off, that means that one component of GDP goes down by that much because  $G$  is one of the components on the right side of the first GDP equation. That doesn't mean that overall GDP must decrease because it

might be the case that the private sector will spend more or invest more or maybe we'll export more and import less.

Some economists believe that there are reasons why less government spending will result in greater private sector saving. I've previously written about why, from both theoretical and empirical perspectives I don't think very much of the *Ricardian Equivalence* argument that underlies this theory.

All other things being equal, as a first approximation GDP will decrease as government spending,  $G$ , decreases. That means that private sector income is decreased and some choice will have to be made about how to allocate that reduction in income. That probably means a reduction in either savings,  $S$ , or consumption,  $C$ . If it is the former, the private sector savings pool is reduced in size. If it is the latter, then since  $C$  is also a component of GDP there will be a feedback effect that further reduces GDP and income.

In an attempt to decrease deficits, the government could also decide to increase taxes, either as an alternative to spending decreases or in addition to such decreases. That increases the outflow from the private sector pool for taxes, so once again the private sector has to decide how to allocate what is left of their income after paying the increased taxes. Those are the same choices we just discussed.

No matter how the government tries to reduce its deficit, there is a negative effect on GDP *unless one or both of the other two sectors increases spending to make up the difference*. And to do this, they must draw from their savings pool.

#### *Using Debt to Add to Pools*

If a sector's pool gets too low, then the sector can replenish it only by assuming more debt. This should make perfect sense because the total amount of money in the system is completely determined by the overall level of debt, so if one sector reduces its debt, the other sectors must collectively increase theirs to keep the amount of money in circulation stable.

Debt can be a pernicious thing because lenders don't just want their principal back, they also want interest along with it. That means that over time the amount of money available, and therefore the level of debt as well, must increase just to pay ever higher amounts of interest. That means that the financial sector will grow ever larger just to collect more interest and decide what to do with it.

At its peak, the financial services industry accounted for approximately 40% of all U.S. business profits. That number is currently closer to 30%. As late as 1980 that number was around 10% of all corporate profits and has grown erratically since then. What is also interesting is that as a fraction of GDP that same industry is now around 8%. So it is clearly much more profitable than other business sectors. The financial sector taking that large a share of profits means that non-financial businesses (who employ the most

people) have a smaller fraction of profits to invest in their companies. To grow they must instead finance new investment, which just exacerbates the overall debt problem. This topic clearly deserves a much longer and more refined discussion, so that will have to wait for some future post. For now I hope you have a sense for the problem that ever increasing private sector debt can be. If nothing else, just remember that the great recession was triggered by the collapse of the private sector housing debt bubble.

### *Debtless Increases to the Government's Pool*

If only there were a way to increase the total amount of money in the system without increasing debt. Hmm... recall the previous discussion about how we account for money creation by the Federal Reserve. I suggested that in fact, offsetting that creation with a liability was incorrect and that it more properly should be accounted for as an increase in capital; i.e., a *liability-free creation of new capital*. With a simple accounting change such as this any new money created by the Fed would result in an increase in its accumulated capital and, under current rules, at the end of the year would be returned to the Treasury, effectively incrementing the government's pool of money. That means that the government could run a deficit without having to issue as much (or perhaps any) debt to keep the pool at the zero level. Voila, new money enters the system without an increase in debt. We would then have to decide exactly how to distribute that money. It's likely that we would not want to just ask the Treasury to spend it all directly, although clearly there is a lot of useful spending that we could do. The Federal government could use some of this new money to support education, or science, or security, or health, or to rebuild infrastructure or as aid to states or in any number of other ways.

Is there a potential downside to this idea? Most emphatically yes, there is. If we were to create so much money that the aggregate demand generated from this process was greater than the productive capacity of the economy, then we would expect prices to rise. That is, the risk is inflation. We could imagine a money creation policy that was tied to the rate of inflation. As inflation increases, the rate of money creation should slow down and vice versa. But think about that for a second. This is almost exactly what the Fed policy is today. In the face of our current low inflation and slow economy the Fed has been doing its best to stimulate the creation of more money with QE. But because that money is spent exclusively in the financial markets (see the next section), that's the only place that experiences price inflation. Although we don't usually think of increases in stock prices as inflation, that's what it is.

If instead the Fed created money that was basically transferred to the Treasury, which in turn transferred it to states or individuals who would spend it, there would be an immediate increase in aggregate demand in non-financial markets that would have a real economic benefit. And all that would occur without a commensurate increase in private-sector debt, in contrast to current Fed policies which are specifically intended to stimulate the economy by increasing private-sector debt.

## Section 5: Money Movement Within and Across Markets

Another way of breaking down the movement of money that I've found to be fairly informative is to think about the two major types of markets that exist. The first I'll call financial markets. This is where financial assets such as stocks and bonds and various sorts of derivative financial instruments are traded. When we think about an individual's investment portfolio, we're generally talking about things that have been purchased within a market such as this.

The second type of market is where basically everything else is traded within the economy. That is, all the real goods and services that we own and/or consume as part of our daily lives. We could also further subdivide this market into markets for consumer goods and markets for capital goods. There are some good reasons to do this, but for now we'll just consider capital and consumer goods markets to be combined into a single real goods market.

I make this two-market distinction because money tends to predominantly circulate within one or the other of these markets. However, two of the most important forms of economic transactions, namely *saving* and *dis-saving* (for purposes of consumption or investment) cause money to move between them. When part of income is saved, money that had been circulating in a non-financial market is transferred to a financial market. The seller of the financial asset that was purchased will generally choose to reinvest in some other financial asset and the money continues to circulate within financial markets.

However, sometimes people will choose to "cash in" part of their saving in order to obtain money which they can use to purchase things in non-financial markets. This is the sort of dis-saving that is common to retirees who use their savings to provide for living expenses. The point is that money moves in both directions between these markets.

There is no denying that over the last several decades there has been a significant movement of money out of the non-financial markets and into the financial markets. Perhaps this is a result of the aggregate savings of the Baby Boomers or perhaps this is a consequence of the increasing levels of inequality in income distribution with more flowing to people with a higher propensity to save. I don't know for sure. If boomer saving is a primary factor then we might have some concern about the impending dis-saving that will accelerate as those same people retire and draw down their savings. If the run-up in the prices was caused by the increasing demand in previous decades, will the decreasing demand cause prices to decrease? Your guess is as good as mine.

The process of borrowing creates a new financial asset (the loan note) which can be further traded within the financial market if the loan originator so chooses. It obviously also provides money for the borrower. Typically, but not always, borrowers will use the money to make purchases within non-financial markets. Sometimes borrowers will use the money obtained to acquire other financial assets on which they expect to make a

profit over time. Those who buy stocks “on margin”, for example, use the purchased stock as collateral for a loan which they expect to pay back out of profits earned by a later sale of the stock. Historically, various investment bubbles have come about because of excessive borrowing for the purpose of purchasing financial assets that are expected to increase rapidly in value.

When a loan is paid back the loan note disappears, which obviously reduces the assets that could potentially be sold in the financial market. If the money used to make the payoff came from normal income then there is effectively a transfer of money from the non-financial market to the financial market where it is destroyed by the process of the loan payoff, right along with the destruction of the loan note.

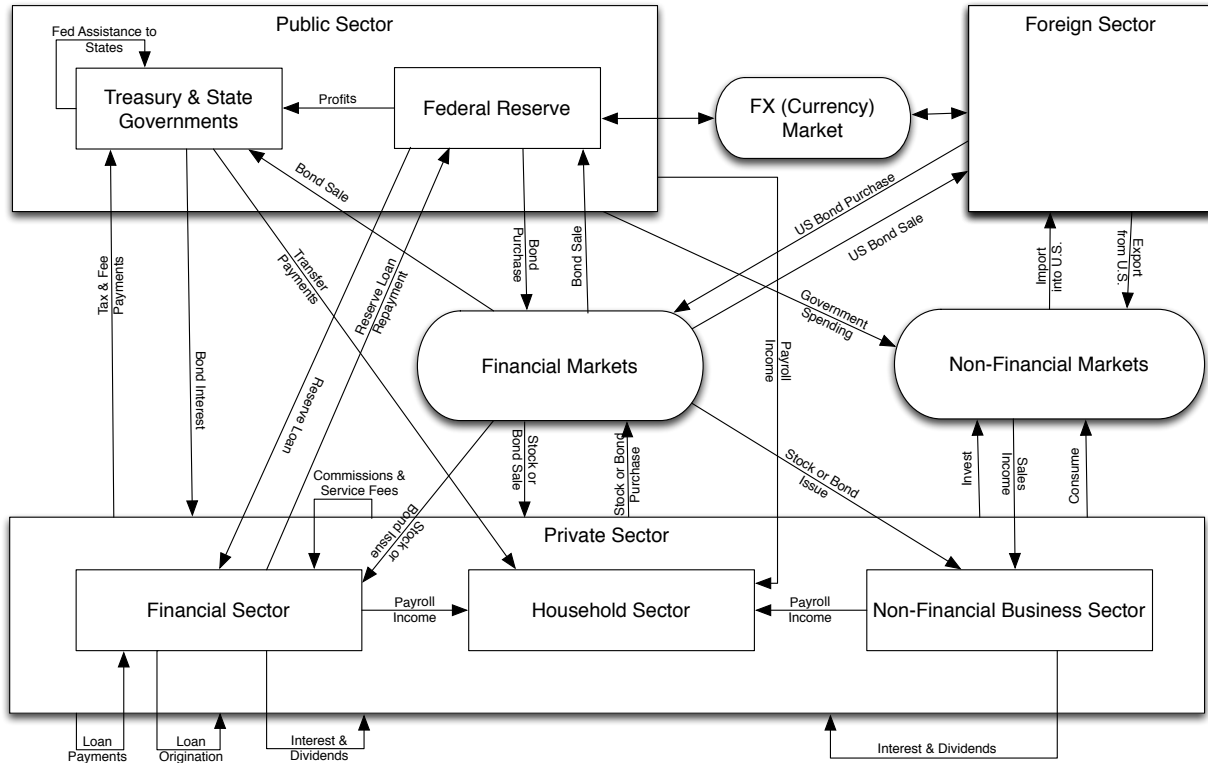
The process of creating and trading assets in non-financial markets is relatively labor intensive, compared to the process of creating and trading financial assets. The labor component of the latter activity is somewhat independent of the value of the transaction. Very high dollar-value transactions can and do occur with very little labor required. Conversely, production of real goods and services tends to require labor in amounts that are proportional to the volume produced.

Why is any of that important? I will submit that it helps us understand the consequences of various sorts of government policies. If the objective is to create jobs, then it is important to have policies that will stimulate an increased flow of money within the non-financial markets. Increasing the flow within financial markets may also create jobs, but many fewer for each new dollar circulated (which is obviously one of the reasons that the financial industry is so profitable). Policies that stimulate saving will tend to cause a movement of money out of non-financial markets and into financial markets, so the government needs to be aware of the potentially adverse consequences of that for jobs. Conversely, policies that encourage borrowing for purposes of spending or investment (in the sense of purchasing capital goods, not buying financial assets) will tend to create more jobs.

This also helps us make sense of policies like quantitative easing (QE). When the Fed purchases securities, it is basically making a purchase within the financial market. That increases demand and (as part of the purchase) reduces the supply of purchasable items which will result in an increase in the average value of financial assets for sale in financial markets. With enough purchases, some jobs might be created, but relatively few compared to the number that would be created by purchasing things with the same dollar value within non-financial markets.

There is a possible secondary effect of QE in that as it increases the aggregate value of things for sale in the financial market, it may make people feel wealthier than they did previously. That may cause them to consider moving money out of the financial market and using it to make purchases in a non-financial market. This obviously involves a bit of wishful thinking and any economic effect it would have in non-financial markets will be significantly less than a direct purchase in those markets would have.

Monetary flows among sectors and markets are more complicated than I've presented so far. But for purposes of providing a basic understanding of what various policies entail we have a pretty good start. Below I've included a diagram that shows every movement discussed so far, plus a few that I won't discuss. For those of you who are, like me, a visual thinker, this may help you make more sense of how money moves around.





## Section 6: Economic problems

Is a society's economic health tantamount to its overall social health? That is, should economic well-being as measured by the amount of aggregate wealth that is created and the fairness of its distribution be the sole criteria for societal success as well? I find that to be problematic. There is more to the quality of life than economic well-being. Nevertheless, I'm writing about economics, so I'll confine myself to a discussion of economic well-being even though I hope everyone understands that I don't think this is all that life is about.

I rewrote this section at least five different times using different organizational schemes in an attempt to make it both comprehensible and comprehensive. I encountered numerous problems with each draft. The economy is both incredibly dynamic and also contains all sorts of feedback loops, so something that seems like a good thing at one point of time is really a bad thing if it occurs under other conditions. Inflation is generally considered to be a bad thing, unless it is too low, as it has been now for a while (although signs are that it may now be increasing to a problem level). So it becomes extremely difficult to differentiate beneficial states from harmful ones. And of course a condition that benefits one group in society often causes problems for another, so there is not necessarily an absolute good or bad to almost any state that we might observe.

### *Economic Goals*

With that said, let me assert some general goals for the economy that I think might resonate with most people. These were created pretty much off the top of my head, so it's quite likely that I overlooked something fundamental. If you disagree or have alternate ideas, let me know. That might make for a good subsequent discussion.

The economic goals I came up with include:

- **Basic subsistence**
  - All members in a society should share in the economic well-being of the society as a whole. Simply being a member of the society should entitle a person to a minimal level of subsistence.
  - The level deemed suitable for basic subsistence will increase over time as the general level of economic well-being increases.
- **Equal opportunity**
  - All children should be given the opportunity to improve their skills and education to whatever extent their native abilities and ambition permit because these improvements benefit society as a whole.
  - People who are supported by society as they make such improvements are expected to pay back society by using their new abilities in a fruitful way. As long as people continue to do this, they should be supported in future efforts to make additional self-improvements.
  - It is incumbent on the economic system to assure that there are sufficient opportunities for people to use their abilities. There is no point in encouraging

people to become better educated if there is no way for them to apply that education.

- **Fair distribution of economic benefits**
  - There will be a diversity of individual economic outcomes within a society.
  - Applied effort, ambition, intelligence, creativity, and skill should be rewarded.
  - A completely uniform distribution of income and wealth would create economic problems because it would provide no incentive for individuals to be economically creative and industrious.
  - Risk taking should be rewarded.
  - The economic consequences of ventures that fail should fall on investors and not on non-participants.
  - It is appropriate for the government to be an investor for very risky endeavors that have great social value. In this case the whole economic society may share in the consequences of a failed venture. This is not an all-or-nothing thing; the degree to which the government is an investor may vary for different endeavors.
  - To some degree the government can be considered an investor in all economic activity since it supplies the basic infrastructure, legal system, security, regulation, etc. which makes all economic activity possible and more efficient.
  - Therefore all members of society should share to some degree in an overall improvement in economic health. It should not be the case that some segment of the population gains at the expense of another. We improve together or we share the pain if we collectively fall back.
- **Improvement over time**
  - The economic well-being of all citizens should improve over time.
  - This means that investment mechanisms should be encouraged.
  - This places a premium on making investment mechanisms work properly.
  - We should also consider the long-term well-being of the economy, which means conservation of scarce resources and preservation of the ecosystem for use by future generations of citizens.
- **Prevention and mitigation of problems**
  - Economic problems may occur for any number of reasons.
  - Economic mechanisms should exist to prevent or detect and mitigate problems so that they have as little detrimental impact as possible.
  - The regulatory and legal systems should assure a fair playing field for all economic agents and legal recourse for unfair practices, no matter what form they take.
  - The legal system must provide mechanisms to mitigate economic damage inflicted by one party on another.

Even if everyone agreed with these objectives, which I wouldn't really expect, the question of how to measure what actually happens in order to assess how well we are doing would be a difficult one to answer. For example, to what degree is the system fair or unfair today? There are almost constant arguments about that question. After that we would have to consider what to do when these goals come into conflict. Are some more important than others? How should we trade off one goal in order to achieve another? The answers to all these questions for any individual are likely to depend on just where that person currently resides on the economic spectrum.

In some sense I think these are the real questions that our politicians should be deliberating before trying to legislate policy. If we haven't agreed on our overall objectives and priorities, how can we possibly agree on what policies should be in place? Of course I've only discussed economic goals and there are most certainly other national goals, many of which are specified in our Constitution. Economic goals would have to be considered within the context of all of our non-economic national objectives.

### *What Causes Economic Problems*

When defining economic problems, it is often difficult to differentiate between causes and effects. Some things are both at the same time in that they seem to have harmful consequences in and of themselves (think high unemployment for example, which is obviously bad for the people seeking to be employed), but can have secondary consequences for a completely different set of people (the lack of consumer demand that derives from high unemployment has a variety of consequences for the whole society).

In previous versions of this section I wrote about:

- The economic states that could be considered problematic (e.g. inflation, deflation, recessions, depressions, bank crises, stock-market crashes, bailouts of too-big-to-fail companies, etc.) and what causes them.
- The sorts of financial patterns of behavior that can result in economic downturns (with the general assumption being that improving economic conditions are better than worsening economic conditions) and what motivated those behaviors. These included things like over-extension of credit for speculative purposes, overly conservative credit extension, high levels of private debt accumulation, low levels of private-sector saving, etc.
- The sorts of social problems that occur and how they are changing over time for different segments of the population (e.g. increasing rates of poverty, worsening health care outcomes, higher rates of unemployment, high costs of education, etc.).
- The sorts of government policies that have been tried and how they seemed to affect the economy. This included various monetary (Federal Reserve), fiscal (tax and spending levels), the national debt, and social welfare and employment policies.

Each of these is interesting and important in its own right and they also interact in some interesting ways. I wrote a LOT more about all of these, but frankly not nearly enough to be happy that I did justice to any of them. And honestly, I STILL haven't come up with any way of creating a concise summary that addresses any significant fraction of that in some organized, coherent fashion.

So, with some regret, I removed pretty much everything that I had written and stashed it away for one or more future posts. I suppose it makes some sense to first talk about *how things actually work* first and then later use that understanding to discuss policies that attempt to address specific sorts of problems.

In the next section I will discuss the one thing that most people regard as an economic problem (our national debt), but other than that I'm going to have to leave the discussion of problems and the various policies that might be appropriate to preventing or solving them to future posts.

## Section 7: The National Debt

Perhaps the only point of general agreement among politicians of all political persuasions is that the size of government deficits and the size of the national debt are big problems. As we should probably expect, any belief that is that widespread is actually wildly misguided. It is based on the view that government debt is pretty much identical to the debt of individual households and must be managed in the same way. But the debt of any country that is in control of its own fiat currency is very much NOT like individual debt. Hopefully I will explain that well enough here that we can all get beyond that misconception and begin to deal with real economic problems rather than worrying so much about a chimerical boogyman.

### *The role of the Federal Reserve*

When Congress created the Federal Reserve System in 1913, they clearly intended that the power to control how much money comes into existence be embodied in an organizational entity that was closely tied to the Treasury Department with at least some nominal influence over it exercised by the Executive branch of the government, but also independent of it so far as policy goes. The Treasury has on occasion asserted more control over the Fed than at other times and the level of cooperation is quite high, but the principle of independent entities remains intact today.

I believe that there has always been a fear that an Executive branch with complete control of money creation could usurp Congressional budget authority and decide to spend more than Congress permitted or spend in ways that were not approved by Congress. Printing money to spend was a real concern when money was backed by gold, because the creation of money subjected the government to a real liability to convert whatever was created into gold. One consequence of this fear is that financing for government expenditures is structured so that the treasury must act much like any bank which needs to acquire base money to conduct its financial transactions. Congress mandated that the Treasury issue debt in the amount of any excess of spending over tax revenue (i.e. in the amount of budget deficits).

Given that the Federal Reserve, which is a creation of the government, is the source of all new money; and given that the creation of new fiat money doesn't represent any sort of explicit liability now that we are off the gold standard, then what the heck is the national debt all about? The reality is that this is another holdover concept from the time before fiat money existed. In those days, the only real money was created by banks that had a sufficient supply of gold to back the money they issued. The Federal Reserve was then just like any other bank in that they had to somehow obtain the gold in order to print more currency. As we have previously discussed, they had more flexibility than the average bank because they could decide to print more currency than they could convert to gold and the executive branch could also decide to suspend convertibility when necessary. Still, there were limits. The government had to either collect taxes, borrow, or print to obtain whatever money they desired to spend and each path had definite economic consequences, both for the government and for the economy at large. This is

still the model that is most widely accepted for how the system really works. But as I described previously, there is now a better model that we could follow.

The possession of gold is no longer any sort of constraint on how much money is created. Witness the Quantitative Easing (QE) process that the Federal Reserve has been engaged in over the last couple of years. Currently the Fed creates new money at the rate of \$35 Billion per month and uses it to procure government bonds and other sorts of financial instruments. Does that add to the national debt? Not one cent. For many months the rate of those purchases was \$85 Billion per month. So if the Fed can create and spend that much money without incurring any new real liability, wouldn't it make sense that the treasury could do the same? Or that somehow the Fed could do it on behalf of the Treasury? Something along those lines would seem to make sense, but unfortunately our current laws regarding the matter are remnants of a time when money required gold backing. So congress, currently mandates that the Treasury issue debt to match all deficits (the excess of spending over tax revenue) and over time those deficits accumulate into what is called the national debt.

As we discussed when we considered sector balances, a public sector (government) deficit (the outflow from the government financial assets pool) is always exactly equal to the sum of the inflows into the private sector and foreign sector pools. That means that the national debt is no more and no less than the sum of the accumulated dollar-denominated financial asset savings (net of debt) of the private and foreign sectors. When seen in that light, you begin to understand why deficits are required and why the national debt has gotten as large as it has. It merely represents the amount of new financial assets that have been injected into the non-public economy. Had the government not done this, the current level of economic activity could only have been supported if that debt had been issued by the private sector instead of the public sector. You can get to the same level of economic activity in different ways, depending on who takes on the debt that generates the money that makes that activity possible. Given previous discussions, I bet you can already guess why it is MUCH better if it is the government that generates the new money.

#### *Direct Treasury Funding from the Fed*

A natural question to ask at this point is why the Treasury doesn't just sell bonds directly to the Fed and avoid all the nonsense in the middle. The simple answer is that this is prohibited by the current laws established by congress. Why? That's another remnant of the gold-standard. That would have been called *monetizing the debt*. It would have created money beyond that which could be backed by gold and was therefore taboo. Today such an action is obviously another matter, but that is simply not understood by almost any politician.

Please note that I am explicitly NOT saying that the Fed should just print an unlimited amount of money for the treasury to spend. The devil is in the details here. An increase in government spending for real goods and services should first result in businesses ramping up to meet that demand. So obviously where the money is first spent will

depend on which businesses need to do this. Ideally this would require those businesses to hire more labor, who would obviously get paid and then spend more of that money. So fairly quickly, the money spent would spread out among many industries and trigger employment increases in many places. If the spending is so large that productive capacity becomes insufficient, then we would expect investment to pick up as well. At some point the private economy would begin to grow on its own without further government stimulus. We would see the overall level of private sector debt pick up to fund this activity.

### *The Current Nature of Treasury Debt*

At this point I'm going to back away from how we could solve the debt "problem" in an ideal world and go back to talking about what everything looks like under current law and current accounting rules. I previously suggested that what gives U.S. currency value is the ability to use it to satisfy all public and private debts in the U.S. But if it isn't backed by gold or anything substantial, then what, exactly, does the government owe to those who hold its debt? The answer is simple, the government owes U.S. dollars and nothing more. And since the Federal Reserve is the sole source of U.S. dollars (base money) and can create new dollars at will, there is no feasible way that the U.S. government can be forced to default on its debt.

Sometimes you will hear people worrying about whether the U.S. will turn into Greece, which did, in fact, default on its debt (ok, technically it wasn't a default, but tell that to all the holders of Greek bonds who took a huge "haircut" on their holdings). But unlike the U.S., Greece no longer has its own currency, it uses Euros and its debt was denominated in Euros. So to pay their debt, Greece had to get Euros from somewhere, they couldn't just manufacture them as the U.S. can manufacture dollars. When the Greek economy contracted from the severe reduction in aggregate demand (exacerbated by large cutbacks in government spending) there simply weren't enough Euros available to pay their debt. The U.S. simply is not in that position and cannot ever be forced into that position.

### *The Debt Limit*

What about the *debt limit*? This another artificial limit that was originally established by Congress to put an additional check on ambitious Presidents who might wage a war or otherwise spend money in ways not formally approved by Congress. It was assumed that under normal conditions where the President was simply spending according to budgets already approved by Congress that the debt limit would be raised as needed. It has, on multiple occasions and by both political parties, been used as a bargaining chip in ongoing political negotiations. In my personal opinion it is a silly law because the way in which it can be misused to bargain for other issues threatens the ability of the U.S. to pay legally sanctioned debts, which is, incidentally, specifically prohibited by the constitution.

It is interesting to consider the notion of a default on the debt. What exactly would that be? The first question to ask is what it is that is actually owed. And the answer that

we've already given is that all government debt is denominated in dollars and so the government never owes anything but dollars. Since the Federal Reserve can create any number of dollars at will, in theory there should be a zero risk of default. But the law that creates a debt limit makes it possible for the government to technically default if Congress refuses to raise it. As I said it is a silly law and we'd be much better off without it.

### *Treasury Debt and Liability*

A normal debt is established when we need to borrow money in order to use it for something. Does the treasury really need to borrow dollars to spend them? Well, according to laws established by congress while under a gold-standard it does, but I expect that you understand by now that the Fed's computers could put dollars into the treasury's account in any amount, at any time, with no need to issue bonds.

It's interesting that this is *exactly* what the Fed did in the post recession bailout of the banks. The Fed bought up all those toxic assets that the banks created using dollars created with keystrokes. There is even a nice video of Ben Bernanke in a 60 Minutes interview where he is asked whether the money used to bail out the banks was taxpayer money. He looks a little confused that anyone might think that and simply says, no, we just keystroked new balances into their accounts. Absolutely correct. And if the Fed can bail out the banks with keystrokes and do QE to the tune of \$85 Billion per month for months on end, then it is equally capable of doing the same for the Treasury. It only requires the national will to do so.

### *How Foreign Countries Acquire U.S. Debt*

Ok, so in theory the treasury doesn't *need* to borrow, but it does, right? Well, yes and no. People often have the sense that we went hat-in-hand to China to beg for a loan to keep us going. But of course nothing could be further from the truth. The reality is that China wanted badly to sell its goods to the U.S. So it offered them at very attractive prices. But those goods had to be paid for using Chinese money, so lots of businesses exchanged U.S. dollars for Chinese Yuan in order to purchase Chinese goods for sale in the U.S. The primary source of those Yuan was, of course, the Chinese government, which then ended up with lots of U.S. dollars. They had a few choices for what they could do with them:

1. They could allow their citizens to use them to buy goods and services from U.S. companies or from others who would accept U.S. dollars.
2. They could exchange them for some other currency on the Foreign Exchange (FOREX) market.
3. They could use them to purchase U.S. bonds.

The didn't want to do #1 because it would create greater demand for U.S. goods and services and thereby make Chinese companies less competitive. It would also tend to increase the demand for U.S. goods inside China, which again, would be detrimental to native Chinese companies.



They didn't want to do #2 because selling that many U.S. dollars in the foreign exchange market would have resulted in a drop in their value, thus decreasing the value of the remaining dollars held by China. A weak dollar would also make imports more expensive for the U.S., thus making it likely that Chinese exports to the U.S. would drop. A weak dollar would also make U.S. exports look better to foreign countries and give U.S. companies a competitive advantage on world markets. So obviously China wanted to avoid that.

So they did the logical thing by choosing door #3 and buying U.S. bonds. The U.S. did not ever solicit that purchase. The bonds they purchased were acquired on the open market. The government's borrowing had already been done long before the bond was purchased by China. As those Chinese-owned bonds pay interest and mature, China will get more U.S. dollars and have the same choices about what to do with them.

### *The Implications of High Levels of U.S. Debt Held by Foreign Countries*

Should all of this be of any concern to the U.S.? I'll admit that I am of a somewhat mixed mind about this. I certainly don't worry about our ability to "pay them back". We can create enough dollars at any time to pay off any amount of debt; to China or to anyone else. At the stroke of a pen congress could authorize the Fed to debit China's U.S. bond account at the Fed (which is exactly how it is recorded) and credit China's U.S. dollar account at the Fed. No muss, no fuss, no debt.

The Fed under the QE program, was purchasing \$85 Billion of U.S. bonds per month for many months. They're now in the process of dropping that amount and are down to a mere \$35 Billion of purchases per month. If we're really worried about how much Chinese debt we have and if the Chinese really want to "get paid back", then fine, let's just authorize the Fed to purchase bonds exclusively from the Chinese in those same amounts. At \$85 B per month it should take about 15 months before China owns zero U.S. debt. Of course China will then hold about \$1.3 Trillion in U.S. dollars that they'll have to figure out how to use ...

So, the real concern I think, is not whether we can pay back China, but rather what China might do with the dollars that we give them when we do pay them back. What if China decided that it wanted to create massive inflation in the U.S. by spending all that money here somehow, would that be a threat? Not really. Even if they spent all that money in a single year, it would only increase the GDP by about 8%. Historically we have had many years where the economy grew at a faster pace. We would probably have to thank them kindly for the stimulus.

What if instead, China decided to buy up critical U.S. assets. I'm not *overly* worried about this because the government can always impose new restrictions or tariffs on such spending and there are already some limits on what foreign governments can purchase here. But of course with enough money China might be able to buy a lot of influence in Washington D.C. and anytime there is a large concentration

of money in the hands of someone who might wish you harm, it is something to be concerned about. So as I said, I have mixed feelings about it.

### *Inflation Risk from High U.S. Debt*

As we have discussed, the existence of the bonds represents no threat to U.S. solvency. There is no way that the U.S. can ever be forced to default, although Congress is perfectly capable of shooting itself in the foot by not authorizing the means to avoid default. But a large amount of money that is employed by someone who potentially wishes us harm can pose a serious threat. Since bonds are convertible at will to money, there is a potential for some risk to U.S. interests.

Suppose, for example, that all bond-holders suddenly decided that the U.S. dollar was going to lose a huge amount of its value and decided all at once to sell their bonds and use the dollars they got to buy something before the bottom dropped out. We'll ignore the practical question of who they would sell their bonds to if everyone thought so little of them. If a sudden sell-off and spending spree did occur, then there might well be a high level of price inflation as sellers raised prices to deal with the increased demand. A quick-thinking government might impose a tax on such transactions from foreign sources to mitigate the effect and certainly other government responses would be possible. How likely is it that something like this could occur?

U.S. bonds are largely used as a savings instrument. That is, people or funds hold them until some time in the future when they are cashed in for dollars. If the bonds mature before that need arises, those savers will typically roll over the payout on an old bond and buy a new one. So if those savers suddenly thought that U.S. bonds were a bad investment they might well sell them. But would we expect them to spend the money they got? No, of course not. They would likely reinvest that money in some other savings vehicle like corporate stocks and bonds or perhaps the bonds of some other more prosperous country. We might well see some inflation in the prices of financial assets, but that would be no different than what we see today with QE.

But if you're still concerned, let's have a look at how many bonds are held for such purposes by considering the breakdown of who holds U.S. debt. Currently (as of June 14, 2014) the total U.S. national debt is approximately \$ 17.5 Trillion. Holders of that debt (in order of how much debt they hold) include:

1. U.S. Social Security Trust Fund (\$ 2.76 Trillion)
2. The Federal Reserve (\$ 2.38 Trillion)
3. Other U.S. government agencies (\$ 2.1 Trillion)
4. China (\$1.26 Trillion)
5. Japan (\$1.21 Trillion)
6. U.S. Households (\$ 0.84 Trillion)
7. Public and Private Pension Funds (\$ 0.72 Trillion)
8. State and Local Governments (\$ 0.58 Trillion)
9. Money Market Mutual Funds (\$ 0.45 Trillion)
10. Belgium (\$ 0.37 Trillion)

11. Caribbean Banking Centers (\$ 0.31 Trillion)
12. Insurance Companies (\$ 0.27 Trillion)
13. Oil Exporters (\$ 0.26 Trillion)
14. U.S. Chartered Banks (\$ 0.26 Trillion)
15. Brazil (\$ 0.25 Trillion)
16. United Kingdom (\$ 0.19 Trillion)

Note: Data from latest government data releases:

<http://www.federalreserve.gov/releases/z1/Current/z1.pdf>

<http://www.treasury.gov/ticdata/Publish/mfh.txt>

So right off we can see that about 41.4% of the national debt is owed by the government to other parts of the Federal government. We could probably depend on them to not sell off their bonds in some sort of frenzy. Another 17.8% is owed to various governments, funds, banks, and individuals residing in the U.S. These are somewhat more likely that government holders to sell off their bonds, but seem quite unlikely to simply go purchase things with the money received for the bonds. There are much more likely to purchase other things available within financial markets, and therefore not create any inflationary pressures within non-financial markets. Presumably many of the foreign holders have other reasons to hold U.S. dollars and would not sell either and several are strong allies of the U.S. The bottom line for me is that I just can't conjure up any credible threat to the U.S that is posed by foreign holdings of U.S. bonds. If anyone can come up with a scenario where there might be some real harm, please pass it on to me.

If we do decide that there is some harm in higher levels of debt, we can always decide to make it smaller just by allowing the Fed to buy it up over time. We could also stop issuing debt as a way to fund treasury purchases. Of course, we should really consider the consequences of such actions and I hope to make that a topic for a future post. Treasury bonds are fundamentally import savings vehicles for many people around the world. They have essentially zero risk and have had historically good returns. Even if we figured out that we never again needed to issue this debt, it is very likely that the financial industry would be begging the government to do so anyway. In fact this is exactly what happened in Australia at a time when its exports resulted in such high tax revenue that the government decided it was unnecessary to issue new debt for a while.

I guess that was a pretty long way to go to say that the national debt isn't really a problem of any sort, but I hope you found the journey worthwhile.

## Appendix: The Basics of double-entry bookkeeping

I think that it is very important to understand some of the basics of double-entry bookkeeping because this is what is used to do all national accounting. The actual transactions that occur tell you quite a bit about how money moves within the whole economy. This is just a quick-and-dirty off-the-cuff introduction to the topic.

There is a basic accounting equation that must always hold for any economic entity:  
$$\text{Assets} = \text{Liabilities} + \text{Capital Equity}.$$

Assets are things that you own and can represent either tangible real assets like cars and homes and machinery or intangible financial assets like money or stock. Note that there are also intangible assets like health and happiness that are so hard to value that we simply decide not to include them in the basic accounting process. They nevertheless play an important role in motivating our actions, so we should always understand that the formal accounting doesn't tell the whole story.

Liabilities represent debts that are owed. For an individual that would include their mortgage, credit card debt, unpaid bills, etc. For a company that might represent any loans that it has taken out, what is owed to suppliers or employees, the value of employee retirement benefits that has been accrued, etc. For a government, those same sorts of things are liabilities and traditionally the value of all money in circulation has also represented a liability because it was convertible into some underlying commodity like gold. See the main discussion for why I think this is no longer appropriate and what might be a better way to account for this.

Capital equity is a little harder to understand, but let's see if I can make it more clear. For a business it represents the value of the initial investment in the company plus the value of any profits that have been retained and minus the value of any losses that are experienced over the life of the company and minus any distributions that have been made to stockholders. So it represents the net stake of the owners of the company. If the company distributes some of their profit in the form of stock dividends, then the value of the capital equity is reduced by that amount as is the value of their cash assets (because they were distributed as dividends) which keeps the equation in balance.

For an individual, there is no initial capital contribution by an owner although it might be reasonable to consider whatever is inherited from parents as a form of capital equity. As we earn a living we receive an income and spend some of it and save some of it. We can consider the amount saved as something akin to the retained earnings of a company. So an individual's capital equity is basically their net worth, namely the value of the assets they own minus the value of any debts they have.

These three general categories can then be broken down further in any way that is convenient for us so that we can track things that we find to be important. We would refer to the set of accounts for any economic entity as its *chart of accounts*. The government along with many international agencies, have spent quite a bit of time and money to define an appropriate chart of accounts to track economic activity and set up

mechanisms to collect and report that data. Each company will create its own chart of accounts, some of which may be dictated by government reporting requirements. Each company will then create reporting and tracking mechanisms to collect the data that goes into those accounts. There are voluminous government regulations and guidelines for how this all should work.

The fundamental rule of double entry bookkeeping is that a change to any account will also require simultaneous changes to one or more other accounts so that the basic equation is ALWAYS kept in balance. For example, if a company pays cash for something, the transaction might increase an asset account that represents the value of the item purchased and decrease a different asset account that represents the amount of cash the company has. If it bought that same item on credit, then the transaction might increase the asset account that represents the item acquired and also increase a liability account for the debt owed. In both cases the basic equation remains balanced.

The terms *credit* and *debit* are often used in conjunction with economic transactions and bookkeepers will say that for every transaction the sum all debits must balance the sum of all credits. What you need to understand here is that a credit to an asset account decreases its value and a credit to a liability or capital equity account increases its value. Conversely, a debit increases the value of an asset account and decreases the value of a liability or capital equity account. So if you follow the rule that every transaction must balance all debits and credits, then no matter what accounts are affected, the basic equation will remain in balance. So for the purchase examples that we used above, there would always be a debit to an asset account representing the newly acquired asset and a credit to another account. In one case that was an asset account and therefore reduced its value and in the other case that was a liability account and therefore increased its value.

A *balance sheet* shows the value of accounts at a moment in time (often also showing comparative values at a previous period of time). It is a fairly static picture of the state of the reporting entity.

An *income statement* or *profit-and-loss statement* or *earnings statement* or *cash flow statement* shows how various accounts of interest changed over some period of time and give a sense of what changed and how quickly.

Pretty much the rest of bookkeeping is about determining the appropriate way to represent various sorts of economic transactions and situations. Guidance for this is provided in the form of a set of *generally accepted accounting principles (GAAP)* which are becoming more standardized internationally by the *International Financial Reporting Standards (IFRS)*. In the United States, both the *Security and Exchange Commission (SEC)* and the *Internal Revenue Service (IRS)* along with various other government agencies have an interest in assuring the companies adhere to accepted accounting practices.