

ARC Course on Money Creation Session Nine

(note to self: See also: "Samuelson debunked thinking notes" word file)

Working title: "Fractional Reserve Banking: A Fractured Fairy Tale"

Subject: Money creation

Theme: Money creation, as explained by Paul Samuelson's version of fractional reserve banking, is deeply flawed.

Contrast: Samuelson's explanation of FRB is still a valid explanation of money creation.

[slide – outline of today's lesson]

1. **Samuelson as the authority on FRB**
2. **Context: where FRB fits into the historic debate**
3. **Analysis and refutation of Samuelson's FRB explanation**
4. **Werner's proof of the credit creation theory through observation and induction**
 - **Most economics is rationalistic**
 - **Observation and induction should be used more often**
5. **Why it matters that you know the right answer**

Today we are going to delve into the banking theory of the late Paul Samuelson, who is the most famous proponent of fractional reserve banking. First, I will introduce the late Paul Samuelson, and review his place in the historic debate on money creation. Then we'll present, analyze, and critique Samuelson's theory of money creation. As part of that critique, we'll present Richard Werner's money-creating experiment, the first of its kind, which I think puts the final nail in the coffin of Samuelson's theory by proving the credit creation theory. Finally, we'll discuss why all this matters - why money creation is not just "angels dancing on the head of a pin," but an important economic issue with real-world importance.

Now, I need to say at the outset that "fractional reserve banking," or FRB, the term applied to Samuelson's theory of money creation, is a term thrown around quite a bit and often used imprecisely. To some, the term means any system of banking in which a portion, or a fraction, of a bank's assets are held in cash to meet the regular withdrawals of depositors. The amount of cash held can be expressed as a fraction of the bank's total assets or deposits (as in, say, 20%), hence the expression "fractional reserve."

But this is not what professional economists typically mean when they talk about FRB. Simply depositing and investing money doesn't include creating new money. That would be what non-banks like mutual funds and money market funds and ETFs do. So, the theory of FRB adds an additional feature, whereby money is created through a network of such individual banks. Most economists' concept of FRB is this specific theory of banking put forth by some economists of the early to mid-20th Century, including the premier spokesman and expositor of FRB, Paul Samuelson. This is the sense in which I use the term in our discussion today. So, for our purposes, Paul Samuelson's theory of money creation IS fractional reserve banking. Some

economists may confuse the issue by not including the money creation aspect of the theory.
[quiz students for understanding]

Who was Paul Samuelson?

[slide Samuelson]

https://en.wikipedia.org/wiki/Paul_Samuelson

Samuelson's years were 1915 to 2009. He attended the University of Chicago as an undergrad, got his Ph.D. from Harvard, and spent an entire career as a professor at MIT. He popularized the ideas of John Maynard Keynes and wrote a famous textbook, *Economics*, that attempted to explain Keynesian principles to undergraduates. Over a long career, he wrote many other papers, books, and treatises as well. He was a champion of mathematics in economic analysis. He served as an economic advisor to John Kennedy, Lyndon Johnson, the U.S. Treasury, and served on the President's Council of Economic Advisors. He wrote a column in *Newsweek* for many years. He was a mixed economist who praised the combination of market and government in achieving economic goals.

Samuelson was the first American to win the Nobel Memorial Prize in Economic Science in 1970 for contributions that ranged over many different fields.

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OCT. 7, 2018, AT 3:17 PM

The Economics Nobel Isn't Really A Nobel

By Maggie Koerth

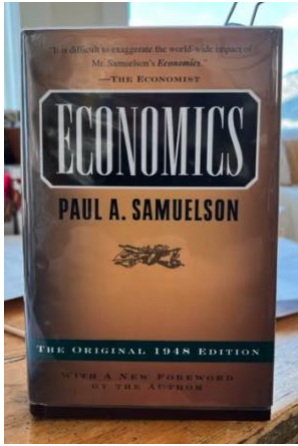
Filed under: [Nobel Prize](#)

[Factual note: The so-called Nobel Prize in Economics is not one of the prizes endowed by [Alfred Nobel](#) in his will. The economics prize is funded by the Riksbank, the central bank of Sweden, starting in 1969. However, the nomination process, selection criteria, and awards presentation of the Prize in Economics all mimic the standards of the original Nobel Prizes, which are awarded for chemistry, medicine, physics, and literature. Winners receive the award at the same ceremony as the scientists and writers. Some say, and I agree, that this was an attempt to legitimize the economics profession.

So technically, there is no "Nobel Prize" in economics. Alfred Nobel's heirs have spoken out against it. Nevertheless, it has become a prestigious award.

Please keep this little fact in mind till the end, you'll see what I mean.]

<https://fivethirtyeight.com/features/the-economics-nobel-isnt-really-a-nobel/>



Today we focus on Samuelson’s famous textbook, first published in 1948, simply titled *Economics*. This book is arguably the most famous and most popular textbook on economics ever written. It has been reprinted at least 19 times, most recently in 2010. According to Wikipedia, by 2018 it had sold over 4,000,000 copies and has been translated into 41 languages.

Our concern today is Chapter 14, “Fundamentals of the banking system and deposit creation.” This chapter is 27 pages covering: A. The nature and functioning of the modern banking system; and B. The creation of bank deposits. Most of our emphasis will be on the creation of bank deposits.

Context: where FRB fits into the historic debate

Before we get into Samuelson, I want to set the stage by reprising the history of the three theories of banking, i.e. of how banks work. Recall this timeline of competing theories of banking from Lesson One.

COMPETING THEORIES OF BANKING AND MONEY CREATION									
1840	1860	1880	1900	1920	1940	1960	1980	2000	2020
Credit Creation Theory									
H.D. Macleod			Alfred Marshall					R. A. Werner	
			Knut Wicksell	J.A. Schumpeter				Bank of England	
			Hartley Withers.	A.C Hahn					
			Von Mises				M. Rothbard		
Fractional Reserve Theory									
		Alfred Marshall		C.A. Phillips		Paul Samuelson*		Joseph Stiglitz*	
				W.F. Crick					
				J.M. Keynes			M. Friedman*		
				F. von Hayek*					
Financial Intermediation Theory									
						James Tobin*		Diamond and Dybvig*	
								Bernanke and Blinder	
						"Many others		Ben Bernanke*	
						too numerous to mention"		Paul Krugman*	
Asterisk (*) indicates Nobel laureate									
Source: R.A. Werner, <i>Can banks individually create money out of nothing? – The theories and the empirical evidence</i> https://www.sciencedirect.com/science/article/pii/S1057521914001070#bb0510									

Quoting Werner: “The credit creation theory was “dominant until about the mid- to late 1920s, featuring leading proponents such as Macleod and Schumpeter. Then the second theory became dominant, under the influence of such economists as Keynes, Crick, Phillips, and Samuelson, until about the early 1960s. From the early 1960s, first under the influence of Keynes and Tobin and the *Journal of Money, Credit and Banking*, the *financial intermediation theory* became dominant.”

<https://www.sciencedirect.com/science/article/pii/S1057521914001070>)

The credit creation theory, held by most economists and bankers and even taken for granted until the early 20th Century, has provided the foundation of this course. This theory says that individual commercial banks create credit instruments in the form of banknotes or bank deposits that are promises to pay out standard money on demand, but which are accepted in the economy as equivalent to the standard money itself.

The fractional reserve theory agrees that banks create money, but insists that only a system of banks, not any individual bank, can do so. Fractional reservists believe an individual bank, acting alone, is merely a financial intermediary that redirects the savings of depositors to borrowers or sellers of financial assets. By the mid-20th Century, the fractional reserve theory had largely supplanted the credit creation theory among most economists. Samuelson is its most prominent and famous explicator, which is why we will use his textbook for our examination of this theory.

Finally, the financial intermediation theory is most widely held today, although the fractional reserve theory is still commonly taught in some undergraduate textbooks. According to Richard Werner, undergraduate courses still teach the fractional reserve theory while post-graduate courses de-emphasize it in favor of the intermediation theory. I personally confirmed this in an informal way: In my review of two very popular college textbooks on money and banking, one promoted Samuelson’s fractional reserve theory while the other described banks as pure financial intermediaries with no acknowledgment that banks are money creators.

In this session, we will not say much about the pure financial intermediation theory, as it provides no explanation at all about how, or if, money is created in the commercial banks. Our concern today is to weigh the evidence supporting either the credit creation theory or the fractional reserve theory.

**Reprise how money creation works under the Goldsmith bank
Device of lending out more certificates than physical gold (banknotes)**

MONEY CREATION UNDER A GOLD STANDARD					
Goldsmith as safekeeper			Goldsmith as Banker		
Assets		Liabilities	Assets		Liabilities
			<div style="border: 1px solid black; padding: 5px;"> Promissory notes from borrowers ("loans") </div>		
					<div style="border: 1px solid black; padding: 5px;"> Depositors' claims to gold (paper certificates or banknotes) </div>
<div style="border: 1px solid black; padding: 5px;"> Gold in storage ("cash reserves") </div>		<div style="border: 1px solid black; padding: 5px;"> Depositors' claims to gold (paper certificates) </div>	<div style="border: 1px solid black; padding: 5px;"> Gold in storage ("cash reserves") </div>		

Before we get deep into Samuelson’s theory, let’s reprise the credit creation theory, which is very simple in concept.

This slide illustrates the evolution of the goldsmith from safe keeper to banker. The illustration captures, in accounting format, the essential feature of modern banking and money creation – namely, the practice of issuing more claims for money than the money physically on deposit in the bank.

On the left is the goldsmith’s balance sheet before he becomes a money-creator. The goldsmith’s assets (called here “cash reserves”) consist of his customers’ gold held for safekeeping, for which he charges a fee. The goldsmith’s liabilities are the depositors’ claims to the gold, evidenced by the paper certificates the goldsmith issued to the depositors. These liabilities are convertible to gold whenever a customer presents a paper receipt at the bank for redemption.

On the right is the “Goldsmith Bank” balance sheet after the goldsmith becomes a banker. The goldsmith prints more redemption certificates than he has gold in the vault. He then lends these certificates out at interest. These certificates are all traded and valued equally in the marketplace. All the certificates are redeemable in gold, even though there is not enough gold in the bank’s possession to redeem all at once.

In other words, the banker printed up additional promises to pay gold on demand and gave them to the borrowers in exchange for the borrower’s pledge to pay back these certificates, with interest, over time. The banker “loaned out” new paper claims on gold, even though no additional physical gold had been deposited to back up these additional certificates. These new certificates were then exchanged equally with the original certificates in the economy. All the old and new gold certificates were then spent and re-spent as they changed hands in the economy, indistinguishable from each other.

As banking developed over time, these gold certificates became known as “banknotes,” which is the term I’ll be using from here on. **A banknote is a certificate issued by the bank that authorizes the bearer of the note to exchange it at the bank for gold on demand.**

Notice that by making this loan, Goldsmith Bank’s balance sheet has expanded; that is, it has gotten bigger. **The banker has acquired a valuable asset, a promissory note from the borrower. Goldsmith Bank’s assets now include the original gold in the vault and the borrower's promissory note (the loan). The bank has also taken on a new liability equal to the loan amount – the obligation to pay out gold to the bearer of the new banknotes on demand. The bank’s liabilities now include the old claims for gold and the new ones loaned out to the borrower. Since all these gold claims have equal status, the old claims to gold cannot be distinguished from the new ones. Thus, the money supply has increased!**

This version of early banking is well supported by lots of historical research. I’ll insert a few references in the manuscript for you to refer to if you are interested.

Samuelson never mentions banknotes.

What is Paul Samuelson’s version of the historic development of banking? In the first section of Chapter 14 Samuelson devotes about four pages (pp 315ff) to describing how modern banking developed from the goldsmith era. He starts with the usual story: goldsmiths as safe keepers, issuing receipts for the gold deposited. He then describes a “discovery” made by the goldsmiths: that they can invest most of the depositors’ gold because depositors rarely redeem their receipts for the real gold, and because regular withdrawals are usually offset by regular deposits. So, 100 percent cash reserves are unnecessary.

However, Samuelson makes no reference in this historical section to the fact that the goldsmiths created more receipts than the gold in the vault. Adhering to Samuelson’s description, the goldsmith bank balance sheet would look like this:

"Non-bank" lends \$50			
Before the loan		After the loan	
Assets	Liabilities	Assets	Liabilities
CASH = 100	Investors claims = 100	Loans = 50	Investors' claims = 100
		Cash = 50	

“Modern banks gradually evolved from the old goldsmith establishments in which money and valuables were stored. The practice finally became general of holding far less than 100 percent reserves against deposits, the rest being invested in securities and loans for an interest yield.” [page 333.

Samuelson says some deposits are held in cash, but most are invested for a yield. He makes no mention of the fact that the goldsmiths created additional, fictitious evidence of deposits and invested these in loans or securities as well.

Samuelson is describing the Goldsmith Bank as a financial intermediary – an agent who lends or invests the deposits on behalf of his customers and takes a fee or a percentage. Under this model, the investing agent would pass investment gains or losses on to his depositors. Samuelson makes no mention of the historic fact that they created deposit certificates (later called banknotes) in excess of the gold they had received. Samuelson also presents these early bankers as fraudulent – not because they issued excess gold certificates; according to the Samuelson description, they did no such thing. The goldsmiths were fraudulent, he says, because they represented that all the gold was still in the vault available for withdrawal, that it had not been invested.

However, to repeat, it is well known that a key feature of 17th century goldsmith banking – and even well before then, perhaps as early as ancient Rome – **is the lending out or issuance of warehouse receipts in excess of the gold held in the vault.** [George Selgin’s paper: “Those Dishonest Goldsmiths,” https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1589709]

In his description of the early development of banking, Samuelson never once mentions that the goldsmiths issued extra gold receipts. Yet I can cite any number of sources documenting this practice. Samuelson would have had to be aware of his many contemporaries who recognized this historical fact, yet he makes no effort to address or refute it.

So right out of the box, in his discussion of the history of banking, Samuelson appears to misunderstand, or misrepresent, the development of early banking. Is Samuelson’s omission due to ignorance or evasion?

Without a close reading of Chapter 14, it is easy to miss this omission, because at first glance it’s easy to confuse a bank with a non-bank. A financial intermediary, like a money creator, can still get into trouble with his depositors if he represents that all the gold is always available for redemption. If all depositors want their gold back, but the goldsmith has invested the gold in non-liquid assets that cannot be easily sold, or which have declined in market price, the depositors can still make a run on the bank and lose money. This problem can occur whether the bank has issued excess certificates or not.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1589709

What Samuelson describes as the goldsmith bank’s investment activity is a simple asset swap. For example, suppose the goldsmith invests some of his customers’ gold in land. In this case, gold leaves the asset side of the balance sheet, and land takes its place, but the value of assets and liabilities is the same before the transaction as after it. This is completely different from issuing excess gold receipts – which later came to be known as bank notes- and lending or investing them for profit. In issuing bank notes and investing them, the goldsmith *increases his*

balance sheet. If he simply invests the money given to him, he does not increase the balance sheet.

A close reading of Samuelson's description of goldsmith banking makes clear he does not recognize any money-creation role for individual banks. Thus, he is ignoring a well-known fact of history in setting up his description of banks, and the unique characteristic of banks that distinguishes them from other financial institutions: they are money creators. And he bases the rest of his analysis on the assumption that banks are pass-through intermediaries, not money creators.

How, then, would Samuelson distinguish commercial banks from, say, money market funds or bond funds? Apparently, by the regulatory rules applied to them, especially cash reserve requirements, which at the time he wrote was approximately 20% of deposits. Simplified, Samuelson's view of a bank is that it is an organization that receives cash deposits and is allowed by law to invest 80 percent of these deposits into interest-bearing securities or loans, keeping 20% of these deposits "in reserve" in cash to service routine withdrawals.

It appears his flawed view of the goldsmith bank operations is the first step in his erroneous view of how banks function. Apparently, he thinks money creation in the banks is a purely modern phenomenon.

Samuelson's description of money creation under fractional reserve banking.

In the second section of Chapter 14, "The creation of bank deposits." Samuelson dives into his explanation of money creation. Right out of the box, Samuelson attempts to discredit the historic credit creation theory, referring to it as a "false explanation" of money creation. An extended "trash talk" quote is revealing.

(My comments are in brackets):

"According to these false explanations, the managers of an ordinary bank are able, by some use of their fountain pens, to lend several dollars for each dollar left on deposit with them. [*The phrasing shows Samuelson starts with the premise that banks need deposits to lend – that first there are deposits, and that banks can somehow lend more deposits than they possess.*] No wonder practical bankers see red when such behavior is attributed to them. [*Samuelson obviously thinks credit creation is fraudulent.*] They only wish they could do so. **As every banker well knows, he cannot invest money that he does not have; and any money that he does invest in buying a security or making a loan will soon leave his bank.**

Bankers, therefore, often go to the opposite extreme. Because each small bank is limited in the way it can "create money," they sometimes argue that the whole banking system cannot create money. 'After all,' they say, we can invest only what is left with us. [i.e. we can invest only deposits] We don't create anything. We only put the communities' savings to work.' Bankers who argue this way are quite wrong. They have become enmeshed in our old friend, the fallacy of composition: what is true for each is not true

for all. **The banking system as a whole can do what each small bank cannot do!**" [page 324]

The fallacy of composition argument would be true *only* if it were true that banks don't individually create money. But Samuelson never proves this; he simply asserts it as self-evident. So, at this point, his explanation of money creation rests on assertions, not proven facts.

Samuelson then spends the next eight pages explaining his theory of money creation. He assumes the process self-evidently starts with a cash deposit, which could be either paper cash or a check drawn against another bank. This deposit supplies the cash reserves which will soon be loaned out. When the bank receives the cash it creates a deposit, a liability, and keeps the cash as an asset. Because of legal limits on fractional reserves, (assumed to be 20%) the bank is now free to invest 80% of this deposited cash. It does this by writing a check to one or more borrowers. As we have seen, this act of lending (in Samuelson's explanation) does not expand the bank's balance sheet, but only swaps cash for a loan or an investment.

Samuelson asserts that the bank cannot lend out money it does not have on hand. Samuelson asserts that, "like everyone else" the bank writes a check to pay for its loans and investments. This process simply replaces cash with investments on the bank's balance sheet. No money is created in the process of investing. "A bank cannot eat its cake and have it, too," he asserts.

In terms of money creation, Samuelson says, "As far as the first bank is concerned, we are through. Its legal reserves are just enough to match its deposits. There is nothing more it can do [in terms of lending] until the public decides to bring in some more money on deposit."

Now Samuelson commences to show how money is created as the loan proceeds are "multiplied" via successive deposits and loans. **When the borrower spends the loaned money, it will soon be deposited in a bank other than the lending bank. When the money is deposited, the receiving bank creates a new deposit and adds cash reserves to the second bank. Presto, a new deposit (new money) has been created!**

In aggregate, the banking system now shows deposits in the first bank are unchanged, but there are now new deposits and new assets in the second bank. **So, for Samuelson, money creation occurs only when the proceeds from a cash loan or a cash purchase of an asset are deposited in each successive bank.** Each successive bank can lend out 80% of its cash reserves, and so on. As borrowers and banks serially lend and deposit the loan proceeds in different banks, they multiply deposits by the reciprocal of the legal reserve ratio. So, if the required reserve ratio for each bank is 20%, the banking system will create money up to five times the required cash reserves ($1 / .20 = 5$).

(The first bank lends 80% of the deposit. The second bank lends 80% of that first 80%. The third bank lends 80% of 80% of 80% of the first deposit, etc. Taken to infinity, the network of banks creates $1 / .2 = 5$ times the original deposit.)

[optional: This model raises an interesting question. When he started the process, Samuelson stated: “We begin with a brand-new deposit of \$1000 which is brought into a bank.” But where did this deposit come from? Was this original deposit itself an act of money creation? It was if it came from the proceeds of a cash loan. Only if it was created by the central bank and given to a member of the public, then deposited into a bank, could the “original” deposit not be from a bank loan or asset purchase. came directly from the Fed would it not be an instance of money creation.]

That’s how Samuelson thinks money is created in the banking system. Bank lending and investing does create money, but only indirectly with a series of subsequent lending and deposits.

Here as I see it are the misconceptions implicit in Samuelson’s account of money creation. **His errors can be grouped into four categories.**

Error Number One. He thinks legal reserve requirements determine money supply because legal reserves drive lending. Samuelson assumes that all banks will lend right up to the legal limit of their cash reserves. Since cash reserves are created by the central bank, the central bank neatly controls the money supply. However, as we saw in Lesson Three, the reality is that bank lending and investing is what tells the central bank how many cash reserves to supply to the banking system.

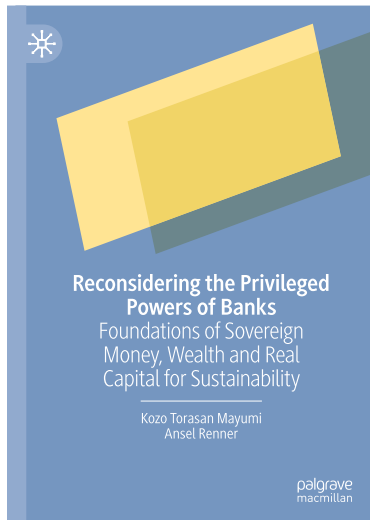
From the Bank of England:

“In reality, neither are reserves a binding constraint on lending, nor does the central bank fix the number of reserves that are available. **As with the relationship between deposits and loans, the relationship between reserves and loans typically operates in the reverse way to that described in some economics textbooks.** Banks first decide how much to lend depending on the profitable lending opportunities available to them — which will, crucially, depend on the interest rate set by the Bank of England. It is these lending decisions that determine how many bank deposits are created by the banking system. **The amount of bank deposits in turn influences how much central bank money [*i.e., cash reserves*] banks want to hold in reserve** (to meet withdrawals by the public, make payments to other banks, or meet regulatory liquidity requirements), **which is then, in normal times, supplied on demand by the Bank of England** (Italics and bold added.)

-*Money Creation in The Modern Economy*, Bank of England, Quarterly Bulletin, Q1 2014

Samuelson’s assumption that cash reserves are a constraint on lending leads him to some silly conclusions. For example, he claims that if a widow withdraws money from her bank account in the form of cash, then bank deposits will shrink by five times that amount, because the money supply is just a neat multiple of the cash reserves in the system.

But in fact, central banks realized long ago that cash reserves are not a constraint to lending in a system of credit creation. The Bank of Canada, the Bank of England, and the US Fed impose no reserve requirements on the commercial banks. Other central banks, such as the ECB and the BOJ, have reserve requirements so tiny that they are virtually zero. See:



This disconnect between bank reserves and money creation by itself renders Samuelson's "reserve multiplication process" story suspect.

Error Number Two. He thinks lending is done by writing a check against the bank's cash.

In Samuelson's world, banks write checks against their cash reserves when they make loans or purchase securities. But in fact, this is a special case that practically never occurs. If you go to a bank for a loan, the bank will always require you to open an account first. The bank benefits from this because account documents help in their due diligence, and because it will encourage you to keep your deposit there. When you get the loan they credit your account with new money, which you are then free to spend, after which the money may or may not leave the bank.

Why did Samuelson rely on a special case in which the bank writes a check on its own cash to the borrower? Perhaps it is because he has already classified individual banks as financial intermediaries whose function is to invest other peoples' money, and this assumption requires him to see each individual bank as a pass-through entity.

To be fair, there is a conceivable (but unrealistic) case for Samuelson's deposit creation scenario because banks sometimes do write checks against their cash reserves. Imagine Bank A wants to buy a company car (for use by all branch employees) from a car dealer who keeps his money at Bank B and does not want an account at Bank A. Bank A could write a check against its cash to the dealer. When the dealer goes to Bank B to deposit this check, Bank B credits him with a new deposit and presents the check back to Bank A for payment. Bank A then sends cash reserves to

Bank B. Therefore, Bank A received a new car, it lost cash reserves to Bank B; and Bank B created a new deposit in the car dealer's account. No new money is created in Bank A. But new money is created in Bank B. This is the special case Samuelson assumes for all bank loans and investments.

So, if loans were, in fact, made by banks writing out checks for cash, Samuelson's description might be more believable. But in fact, this is not how banks make loans. Banks always fund loans, certainly all large loans, by creating new deposits.

[optional: It is not important if the loaned money "leaves the bank," i.e., whether the borrower redeposits it into the lending bank. What is important is whether the bank loses too many cash reserves. Bank balance sheets typically change very little day to day because withdrawals are normally offset by nearly equal deposits. So, if the borrower takes his money away to another bank, it's likely it will be offset by deposits from other customers. Was Samuelson not aware of this fact?]

For Samuelson's fractional reserve model to work, *the new deposit must be a cash deposit and the new loan must be a cash loan.* This is unrealistic since even very small bank loans are rarely paid out in cash.

[optional: Another possible flaw is that if each individual bank was merely a financial intermediary, as is claimed according to this theory, it is questionable whether it could legally record client deposits on its balance sheet. Financial intermediaries, such as brokerage firms, mutual funds, and asset managers, do not claim client deposits as assets or liabilities. They act as trading agents or custodians of assets and liabilities, not owners. When I was an asset manager at a San Diego firm a few years ago, we had at one time \$125 billion of assets under management. We invested this money for clients and charged a fee. But none of this money was an asset on our balance sheet. Our assets were very modest: buildings, offices, computers, software and so on. Our liabilities consisted mostly of partners' equity and no debt because we didn't have to borrow money. Accounting rules vary among different financial companies. But in a typical bank, the bank's assets are its loans and investments. Its liabilities are deposits, debt, and shareholders' equity. A bank owns its assets and owes its liabilities, most of which are customer deposits. It is questionable whether a mere pass-through entity would be allowed to claim investments of customer money as assets.]

Error Number Three. Samuelson says no single bank can create money, but the case of a monopoly bank contradicts this assertion.

Samuelson says many competing banks can create money while no single bank can. But this completely ignores the banking jurisdictions in which one monopoly bank, or a small number of state-supported banks, which can easily create all the money the economy needs. For example, Soviet Russia had one bank. Banks in authoritarian jurisdictions, which are also often in inflationary countries like Argentina, have only a few banks, some of which might be state-owned. Canada has only five banks of any importance. The UK is similar. All these countries easily create all the bank deposits they could possibly need!

Samuelson acknowledges this monopoly bank problem but attempts to deal with it by imagining a monopoly bank with many branches, which would presumably allow rapid money creation because borrowers would be redepositing their cash loans right back into the same bank. So, says Samuelson, a single monopoly bank *would* be able to do what each small bank cannot do, as long as the monopoly bank had many branches.

But this admission then begs the question: why would a monopoly bank write out checks against its cash reserves, only to have those checks deposited right back into the same bank? With a monopoly bank, everyone with a bank account uses the same bank. Why would it not instead simply credit the borrower's account? The effect would be the same as if the bank wrote cash checks: as loans were made, deposits would grow while cash reserves would stay the same. Samuelson obviously knows that people transact primarily by moving account entries from one bank account to another. So why wouldn't a monopoly bank, when making a loan, simply credit the borrower with new money in his account and increase the money supply directly by creating a new deposit, rather than do it the roundabout way of writing a check that has to be redeposited right back into the same bank?

If you grant this is the only logical way for a monopoly bank to make a loan, then the next logical step would be to ask: why wouldn't a network of independent banks also do the same? In a dynamic banking system, where deposits are leaving and entering all banks in nearly equal amounts, there is little risk of net deposits "soon leaving the bank." This is more a problem for small banks than larger banks, who are likely to share many transacting parties, making it easy to transfer deposits from one account to another without losing reserves. In any case, banks can manage their reserves by attracting deposits, to keep adequate reserves on hand to meet redemptions. The bank certainly has the legal power to create deposits directly, as we showed in Chapter Two. So why would banks make loans by writing out checks when it is so much simpler to credit borrowers' accounts with new money?

[optional] "It is a mystery why Samuelson did not recognize this as approximating the standard case, and instead chose to highlight a hypothetical and highly unusual special case where a bank will pay out a loan in cash to someone who does not hold an account at the bank.¹⁶ It is even more mysterious why later editions of this most influential textbook dropped out this section on the netting of interbank liabilities and consequent money creation by the banking system without direct restraint from reserves." - Werner

Still, despite all these refutations, there is still a problem. So far, the competing theories of money creation are mere assertions by their proponents: Samuelson says the bank does not create money when lending, while others like Werner claim they do. Since both the credit creation and fractional reserve theories do account for money creation, but each in a different way, we seem to have a stand-off, a "state of muddlement" as one observer put it.

But Richard Werner has a solution:

How can the issue be settled and the ‘muddlement’ cleared up? One reason for this “state of muddlement” is likely to be the methodology dominant in 20th century economics, namely the hypothetico-deductive method. **Unproven ‘axioms’ are ‘posed’ and unrealistic assumptions added, to build a theoretical model.** This can be done for all three theories, and we would be none the wiser about which of them actually applied. How can the issue be settled? The only way the facts can be established is to leave the world of deductive theoretical models and consider empirical reality as the arbiter of truth, in line with the inductive methodology. In other words, it is to empirical evidence we must turn to settle the issue.”

In other words, Werner thinks modern economics is a rationalistic discipline, and I agree! Which leads us to Samuelson’s error number four.

Error Number Four. Samuelson gets the accounting wrong, which Richard Werner proves with an empirical test.

Ultimately, the test of which version of money creation is correct lies in the accounting. If Samuelson is correct, the accounting for the creation of a loan on a bank’s balance sheet will look like this:

Table 2. Account changes due to bank loan (*fractional reserve theory*).

Step 1. Precondition for the bank loan			
Assets		Liabilities	
Excess Reserves	+E 200	Deposits	+E 200
Total	+E 200	Total	+E 200
Step 2. The bank loan			
Assets		Liabilities	
Excess Reserves	– E 200		
Loans and investments	+E 200		
Total	0	Total	0

Under Samuelson’s explanation, there will be no increase in the balance sheet, either in assets or liabilities, when the loan is made. Instead, cash (“excess”) reserves will be replaced by a loan asset. Of course, the accounting would be the same if banks are solely financial intermediaries, i.e., no money is created at the individual bank level when the loan is made.

On the other hand, if the credit creation theory is correct, the bank’s balance sheet will increase equally on both sides when a loan is made. The increase in loan assets will be exactly matched by an increase in deposits, like this:

Table 1. Account changes due to bank loan (*credit creation theory*).

Assets		Liabilities
Loans and investments	+E 200	Deposits (borrower's A/C) +E 200
Total	+E 200	Total +E 200

Now all we must do is observe the changes in an actual bank balance sheet to see what happens when a real loan is made. Time for the challenge flag: how did it really happen?

What a simple idea. Just look at a bank balance sheet before and after a loan and observe if the transaction created new money! You wonder why someone has not already done this, because until we do, we are stuck with one assertion against another.

Why was this real-world experiment never done before? Surprisingly, in the observation period of Werner's review of these competing theories— from the mid-19th century until 2014 – **no scientific empirical test had been reported in the peer reviewed journals.**

One reason is that the debate was confined to the academic world of economics, which does not value empirical observation. So, each of these points of view – the credit creation theory and the fractional reserve theory – each seem to be plausible within their own theoretical worlds. **This is consistent with the rationalistic nature of economics.**

Another reason is that an actual forensic examination of a bank's computer ledger is not so easy! The practical problem lies in the fact that all modern banks are highly automated, operating nearly 24/7; their records are sensitive and private; and their software is proprietary. The day-to-day changes in a bank balance sheet consist of many entries, large and small, that record the constant inflow and outflow of deposits, expenses, loans, and loan payoffs. In a large bank, these transactions would be in the thousands daily. So, isolating the balance sheet effects of a single loan, while not exposing the records to privacy and IP violations, might be quite difficult. Banks were eager to cooperate, as Werner found when he started looking for volunteer banks to help him conduct the experiment.

Eventually, a manager of a small bank (Raiffeisenbank Wildenberg e.G., located in a small town in the district of Lower Bavaria) agreed to cooperate. The bank was operationally comparable to all banks, large and small: it used the same software, accounting standards, auditors, and statement protocols. Thus, Werner could be sure his conclusion was universal to all banks. In other words, all he needed was one test to make a valid inductive leap to the general bank population.

Werner devised a test whereby he would take out a large loan from a very small bank. In this way, the size of his transaction should be visible against the remainder of the bank's daily activity. He would look at the bank's balance sheet before and after the loan was made, then attempt to isolate the loan transaction to see if it was accounted for by an equal increase on both sides of the balance sheet.

Werner arranged to take out EU 200,000 Euro loan, which would be paid back immediately after the observation period. He would then examine the accounting record before and after the loan transaction to see whether the accounting record matched the credit creation theory or the fractional reserve theory.

To summarize this experimental setup: Either the money for the loan is created by the act of making the loan, or the loan money comes out of another account from within the bank. These are the only two possibilities. Therefore, when a loan is made, the balance sheet can change in only one of two mutually exclusive ways. Either it will expand (credit creation theory), or it will remain the same (under either the fractional reserve or financial intermediation theory, both of which see individual banks as intermediaries).

What were the results of the experiment?

A forensic examination of the accounting changes in the balance sheet, before and after the loan was made, observed the following:

[slide: results of the experiment – “challenge flag”]

1. Loan of E 200k appeared in Werner's bank account, in his name, as a “current account,” or what American bankers would call a checking account.
2. After accounting for all known uses of cash, the bank's cash reserves did not change during the observation period, revealing that the loan was not sourced from the bank's cash reserves.
3. Bank's staff confirmed they did not need to check reserve amounts before extending the loan, even though the loan (200k) was a significant proportion of the bank's reserves.
4. No other banks were involved in the transaction.
5. No prior deposit was required for the loan decision.
6. Accounting analysis which eliminated all other transactions showed that assets (loans) and liabilities (customer deposits) both increased by exactly the amount of the loan: E 200k

These results match only the credit creation theory, and do not match either the fractional reserve theory or the intermediation theory.

[optional: For further forensic accounting explanation, see John Titus:

<https://investmentresearchdynamics.com/financial-markets/how-do-banks-create-money-out-of-thin-air/>]

[slide – Werner quote]

“Henceforth, economists need not rely on assertions concerning banks. We now know, based on empirical evidence, why banks are different...from both non-bank financial institutions and corporations: it is because they can individually create money out of nothing.”

“Thus it can now be said with confidence for the first time – possibly in the 5000 years' history of banking - that it has been empirically demonstrated that each individual bank creates credit and money out of nothing, when it extends what is called a ‘bank loan’. The bank does not loan any existing money, but instead creates new money... The implications are far-reaching.”

Why it matters to know how money creation really works

Why was it important that Werner disproved Samuelson’s explanation, once and for all? After all, both the credit creation theory and they both “sort of” get you to the same place in that both theories understand that money is created in the banking system.

I’ll first give you my answer, then finish with some observations from Werner.

IMPLICATIONS FOR GENERAL ECONOMIC UNDERSTANDING.

Trying to understand money creation through the lens of fractional reserve banking theory is like trying to hit a fastball wearing beer goggles. You might hit the ball occasionally, but you will be lucky to do so. This is because Samuelson’s explanation is not only inaccurate but overly complex. Purging his complicated machinery from your mind frees you to concentrate on the simple truth of banking and its implications.

When you are no longer confused about the mechanics of money creation, you see the direct role on money creation at the level of each individual bank. This allows you to understand other derivative facts.

1. The direct role of banks in money creation allows you to see that bank credit creation and economic growth are connected at the point where new money is applied to productive investment. Further, you see that credit extended for different types of transactions affects the economy differently.
2. Direct role of banks in money creation allows you more clearly see the effects on prices via the Cantillon effect because the new money goes directly from the bank to the borrower who spends it on his preferred projects. In other words, because a loan is new money, we can directly see how new purchasing power affects the prices of the specific goods it is spent on.

3. Direct role of the banks in money creation allows you to see the difference, at the bank level, between productive and unproductive money creation. Recall our example of Mr. Chow in Lesson Three. Understanding money creation through the lens of the credit creation theory allows us to make the direct connection between new money and economic progress, as long as the new money is productively deployed. Or vice versa if it is unproductively employed.

4. Understanding the direct role of banks in money creation allows you to understand how banks can be influenced or manipulated by central banks. You can see quantitative easing as simultaneously and immediately creating both bank reserves AND bank deposits.
 - a. Under Samuelson, it's hard to grasp how the Fed causes money to be created in the banks, i.e., hard to understand why record cash reserves under QE have not caused the banks to create more money, and hard to see why record cash reserves from QE did not cause consumer price inflation.
 - b. His faulty explanation may be the reason the money creation part of QE is often missed. Under Samuelson, you might understand how reserves are created (by purchasing bonds from the bank) but you might not grasp that the bank created new money in the first place by purchasing the bonds.

5. Implications for investors and voters:
 - You can better anticipate price changes if you know where the newly created money is being spent. Example: stocks and bonds and QE
 - you can better anticipate the moves of government if you know how they can manipulate the creation of money: you'll have a better idea of how to avoid the effects of wasteful spending and unproductive money creation. For example, if you understand how money creation facilitates excessive government debt, you will see why interest rates might rise dramatically, and this would alert you to a heightened risk of owning long term government bonds.

Implications for good voters:

 - You can see that our monetary system is unsustainable, and knowing how the money creation system works will help you identify knowledgeable political representatives when the time comes to change the monetary system.
 - There are many implications for better regulation of banking and reform of central banks, as well as a strong argument for restricting government spending. Understanding money creation enable voters to grasp these issues much better, and hopefully do something about it.

IMPLICATIONS FOR BROKEN KNOWLEDGE SYSTEMS

I believe this debate, over an issue that should be common knowledge, is evidence that the confusion around money creation comes from a broken knowledge system, like the broken knowledge systems governing history, climate science, and some fields within medicine to name a few. What are the components of this broken system?

- a. False information has persisted in academia.
- b. In part, this persistence must be due to thinking errors. Rationalism dominates economics and finance in the academic world.
- c. Investment professionals, the practitioners, are more likely to get it right.
- d. Obfuscation by central banks may be part of the reason
 - Greenspan was the master of “Fedspeak”
 - Others followed: Bernanke, Yellen, Powell
 - Bernanke affirmed, then denied, that Fed “prints money”
 - Bernanke says banks simply redirect savings, yet his 2002 suggestion of monetizing private assets indicates he knows exactly how the central bank creates money through the commercial banks.
 - Thomas Jordan of SNB is an honest exception
 - Mervyn King of BOE may be an exception
 - Central bankers are much more candid after they retire and become consultants to the investment industry!

The real personal implications here are: do not take for granted what the designated experts tell you! You must be critical in your thinking. If an expert is not able or willing to explain to you some theory or phenomenon in terms you understand, be careful about basing further knowledge on his assertion. Think independently.

IMPLICATIONS FOR ECONOMIC THEORY

I will let Richard Werner speak on this question:

“...the empirical evidence presented in this paper has revealed that the many supporters of the *financial intermediation theory* and also the adherents of the *fractional reserve theory* are flat-earthers that believe in what is empirically proven to be wrong and which should have been recognizable as being impossible upon deeper consideration of the accounting requirements.”

Werner pulls no punches. It is literally as if you put took a flat-earther on a ride into space to let him see that the earth really does resemble a giant sphere.

“That such important insights as bank credit creation could be made to disappear from the agenda and even knowledge of most economists over the course of a century delivers a devastating verdict on the state of economics and finance today. As a result, the public understanding of money has deteriorated as well. Today, the vast majority of the public is not aware that the money supply is created by banks, that banks do not “lend” money [quotation marks added] and that each bank creates new money when it extends a loan.”

Progress in economics and finance research would require researchers to build on the correct insights derived by economists at least since the 19th century (such as Macleod, 1856). The overview of the literature on how banks function, in this paper and in [Werner \(2014b\)](#), has revealed that economics and finance as research disciplines have on this topic failed to progress in the 20th century. The movement from the accurate *credit creation theory* to the misleading, inconsistent and incorrect *fractional reserve theory* to today's dominant, yet wholly implausible and blatantly wrong *financial intermediation theory* indicates that economists and finance researchers have not progressed, but instead regressed throughout the past century. That was already [Schumpeter's \(1954\)](#) assessment, and things have since further moved away from the *credit creation theory*.

[slide]

“In science and engineering, progress is cumulative; we stand on the shoulders of giants. In money and markets, progress is rather cyclical; we keep making the same mistakes. “

– Jim Grant, *Grants*, Nov 10, 2023

Refer to the Nobel Prize. The Riksbank had to buy respectability for the economics profession. Is this any wonder, given Werner’s evaluation of the profession?



MONEY
WHENCE IT CAME, WHERE IT WENT

With a new foreword by JAMES K. GALBRAITH

JOHN KENNETH GALBRAITH

Money: Whence It Came, Where It Went Kindle Edition

by John Kenneth Galbraith (Author), James K. Galbraith (Foreword) | Format: Kindle Edition

4.5 ★★★★★ 88 ratings 4.0 on Goodreads 308 ratings See all formats and editions

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Money is nothing more than what is commonly exchanged for goods or services, so why has understanding it become so complicated? In *Money*, renowned economist John Kenneth Galbraith cuts through the confusions surrounding the subject to present a compelling and accessible account of a topic that affects us all. He tells the fascinating story of money, the key factors that shaped its development, and the lessons that can be learned from its history. He describes the creation and evolution of monetary systems and explains how finance, credit, and banks work in the global economy. Galbraith also shows that, when it comes to money, nothing is truly new—least of all inflation and fraud.

It is completely ironic that another famous Keynesian economist, a contemporary of Samuelson, held a completely correct view of money creation and even wrote a book about it. This was John Kenneth Galbraith, years 1908 to 2006, whom I have quoted before. His book is called *Money: Whence It Came, Where It Went*. This book was one of the main reasons I undertook this study of money creation. The problem with this book was that it was not published until 2016, many years after Galbraith died. Had it been presented against the Samuelson theory, we might have been spared decades of confusion.

I began this course with this quote from Galbraith. It’s a great retort to Samuelson’s house of mirrors, and a great way to end the course.

“The process by which banks create money is so simple that the mind is repelled. Where something so important is involved, a deeper mystery seems only decent.”

- Galbraith, John Kenneth. Money (p. 22). Princeton University Press. Kindle Edition.

[END OF MANUSCRIPT]

BONEPILE

John Titus:

<https://investmentresearchdynamics.com/financial-markets/how-do-banks-create-money-out-of-thin-air/>

Typical definitions of Fractional Reserve Banking:

<https://www.thebalancemoney.com/what-is-fractional-reserve-banking-4590236>

<https://corporatefinanceinstitute.com/resources/economics/fractional-banking/>

<https://www.wallstreetmojo.com/fractional-reserve-banking/>

<https://www.sciencedirect.com/science/article/pii/S1057521915001477>

<https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2014/money-creation-in-the-modern-economy.pdf>

5.4.1. Implications for economic theory (from Werner’s papers)

The empirical evidence shows that of the three theories of banking, it is the one that today has the least influence and that is being belittled in the literature that is supported by the empirical evidence. Furthermore, it is the theory which was widely held at the end of the 19th century and in the first three decades of the twentieth. It is sobering to realise that since the 1930s, economists have moved further and further away from the truth, instead of coming closer to it. This happened first via the half-truth of the *fractional reserve theory* and then reached the completely false and misleading *financial intermediation theory* that today is so dominant. Thus, this paper has found evidence that there has been no progress in scientific knowledge in economics, finance and banking in the 20th century concerning one of the most

important and fundamental facts for these disciplines. Instead, there has been a regressive development. The known facts were unlearned and have become unknown. This phenomenon deserves further research. For now it can be mentioned that this process of unlearning the facts of banking could not possibly have taken place without the leading economists of the day having played a significant role in it. The most influential and famous of all 20th century economists, as we saw, was a sequential adherent of all three theories, which is a surprising phenomenon. Moreover, Keynes used his considerable clout to slow scientific analysis of the question whether banks could create money, as he instead engaged in ad hominem attacks on followers of the *credit creation theory*. Despite his enthusiastic early support for the *credit creation theory* (Keynes, 1924), only six years later he was condescending, if not dismissive, of this theory, referring to credit creation only in inverted commas. He was perhaps even more dismissive of supporters of the *credit creation theory*, who he referred to as being part of the “Army of Heretics and Cranks, whose numbers and enthusiasm are extraordinary”, and who seem to believe in “magic” and some kind of “Utopia” (Keynes, 1930, vol. 2, p. 215).³³

Needless to mention, such rhetoric is not conducive to scientific argument. But this technique was followed by other economists engaged in advancing the *fractional reserve* and later *financial intermediation* theories. US Federal Reserve staffer Alhadeff (1954) argued similarly during the era when economists worked on getting the fractional reserve theory established:

“One complication worth discussing concerns the alleged “creation” of money by bankers. It used to be claimed that bankers could create money by the simple device of opening deposit accounts for their business borrowers. It has since been amply demonstrated that under a fractional reserve system, only the totality of banks can expand deposits to the full reciprocal of the reserve ratio. [Original footnote: ‘Chester A. Phillips, *Bank Credit* (New York: Macmillan, 1921), chapter 3, for the classical refutation of this claim.’] The individual bank can normally expand to an amount about equal to its primary deposits” (p. 7).

The creation of credit by banks had become, in the style of Keynes (1930), an “alleged ‘creation’”, whereby rhetorically it was suggested that such thinking was simplistic and hence could not possibly be true. Tobin used the rhetorical device of *abductio ad absurdum* to denigrate the *credit creation theory* by incorrectly suggesting it postulated a ‘widow’s cruse’, a miraculous vessel producing unlimited amounts of valuable physical goods, and thus its followers were believers in miracles or utopias.

This same type of rhetorical denigration of and disengagement with the *credit creation theory* is also visible in the most recent era. For instance, the New Palgrave *Money* (Eatwell et al., 1989), is an influential 340-page reference work that claims to present a ‘balanced perspective on each topic’ (Eatwell et al., 1989, p. viii). Yet the *financial intermediation theory* is dominant, with a minor representation of the *fractional reserve theory*. The *credit creation theory* is not presented at all, even as a possibility. But the book does include a chapter entitled “Monetary cranks”. In this brief chapter, Keynes’ (1930) derogatory treatment of supporters of the *credit creation theory* is updated for use in the 1990s, with sharpened claws: Ridicule and insult is heaped on several fateful authors that have produced thoughtful analyses of the economy, the monetary system and the role of banks, such as Nobel laureate Sir Frederick Soddy (1934) and C.H. Douglas (1924). Even the seminal and influential work by Georg Friedrich Knapp (1905), still favourably cited by Keynes (1936), is identified as

being created by a ‘crank’. What these apparently wretched authors have in common, and what seems to be their main fault, punishable by being listed in this inauspicious chapter, is that they are adherents of the *credit creation theory*. But revealingly, their contributions are belittled without it anywhere being stated what their key tenets are and that their analyses centre on the *credit creation theory*, which itself remains unnamed and is never spelled out. This is not a small feat, and leaves one pondering the possibility that the [Eatwell et al. \(1989\)](#) tome was purposely designed to ignore and distract from the rich literature supporting the *credit creation theory*. Nothing lost, according to the authors, who applaud the development that due to

“the increased emphasis given to monetary theory by academic economists in recent decades, the monetary cranks have largely disappeared from public debate ...” (p. 214).

And so has the *credit creation theory*. Since the tenets of this theory are never stated in [Eatwell et al. \(1989\)](#), the chapter on ‘Cranks’ ends up being a litany of ad hominem denigration, defamation and character assassination, liberally distributing labels such as ‘cranks’, ‘phrase-mongers’, ‘agitators’, ‘populists’, and even ‘conspiracy theorists’ that believe in ‘miracles’ and engage in wishful thinking, ultimately deceiving their readers by trying to “impress their peers with their apparent understanding of economics, even though they had no formal training in the discipline” (p. 214). All that we learn about their actual theories is that, somehow, these ill-fated authors are “opposed to private banks and the ‘Money Power’ without their opposition leading to more sophisticated political analysis” (p. 215). Any reading of the highly sophisticated [Soddy \(1934\)](#) quickly reveals such labels as unfounded defamation.

To the contrary, the empirical evidence presented in this paper has revealed that the many supporters of the *financial intermediation theory* and also the adherents of the *fractional reserve theory* are flat-earthers that believe in what is empirically proven to be wrong and which should have been recognisable as being impossible upon deeper consideration of the accounting requirements. Whether the authors in [Eatwell et al. \(1989\)](#) did in fact know better is an open question that deserves attention in future research. Certainly the unscientific treatment of the *credit creation theory* and its supporters by such authors as Keynes, who strongly endorsed the theory only a few years before authoring tirades against its supporters, or by the authors in [Eatwell et al. \(1989\)](#), raises this possibility.