Economic Review

Federal Reserve Bank of Dallas
March 1984

The definition of money has been controversial for a century. Competing definitions spring from selective emphasis on particular functions or properties of money. Most of the things called money in recent years can be traced to ten approaches that are distinguished by the functions or properties emphasized. Nine of the ten help illuminate the financial system and suggest why money matters. But only three are free of elementary misconceptions and fallacies. The three promising approaches emphasize the means of simultaneous payments, the means of payment that can be used without incurring debt, and the routine circulation of the media of exchange. Together, they point the way to a clearer understanding of this most confusing of economic concepts.

Ten Approaches to the Definition of Money

*By Dale K. Osborne**

A principal purpose of definition is to bring peace of mind.
—P. B. Medawar and J. S. Medawar (1983)

1. Introduction

The beginning student is taught that money is the medium of exchange. She learns to identify it as currency in the hands of the public and transaction accounts held for the public by depository institutions. But she doesn't have to read very far in money and banking before finding other things called money, too. Some writers tell her that time and savings accounts at financial institutions are also money or that travelers' checks or credit cards are money. Some writers tell her that the definition of money is an empirical matter, a thing that is not determined by agreement but by discovery. Some tell her that money is whatever correlates most highly with gross national product or that it is whatever has the stablest demand function. Many writers do not state their definitions explicitly but force her to infer their definitions from the way they use the word. Most write as if everyone shared their definitions of money even when they use the word in an eccentric manner. All confuse her. Indeed, they confuse each other:

> It is a singular and, indeed, a significant fact that, although money was the first economic subject to attract men's thoughtful attention, and has been the focal centre of economic investigation ever since, there is at the present day not even an approximate agreement as to what ought to be designated by the word. The business world makes use of the term in several senses, while among economists there are almost as many different conceptions as there are writers upon money. (Andrew 1899, p. 219)[1]

The multiplicity of definitions owes something to

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1. Quoted in Gambs (1977).

the intrinsic complexity of the concept. Money is interesting and important because of what it does; and what it does, and why, lends itself to different emphases. Different writers emphasize different properties of money and often write as if only the emphasized property were important. This leads them to approach the definition of money in different ways. The many things called money during the past 25 years can be traced to ten discernible approaches classifiable into six groups according to emphasis. One approach emphasizes tangible media of exchange. Another emphasizes "liquidity." Three approaches emphasize means of payment. One approach emphasizes the relation between the money supply and aggregate spending, while another emphasizes stability of the money-demand function. Three approaches emphasize neoclassical monetary theory but attribute the theoretical importance of money to three different properties of money. All ten will be explained and evaluated below.

These ten approaches can be traced to fewer than ten logically distinct roots. For example, the approach that emphasizes the stability of money demand and the approach that emphasizes correlation between the quantity of money and total spending undoubtedly have the same root (see Mason 1976); moreover, this root lies in essentially the same monetary theory with which we explicitly associate three other approaches. But the literature tends to treat them as distinct, and I shall do the same for my aim is not a neat classification but a clearer understanding.

The complexity of the concept of money is not the only cause of the multiplicity of money definitions. Writers upon money do not always pay sufficient attention to elementary but important distinctions. For example, writers who refer to the definition of money as an empirical matter are confusing the *definition of a word* with the *identification of the things* that, satisfying the definition, ought to be called by the word. Although the identification is empirical, the definition itself is inescapably conceptual. Try as we might, we can never erect an "empirical definition" of anything. Our definition serves as the ultimate criterion for our empirical identifications; it is what we turn to when trying to decide whether some particular thing ought to be called by the word we've defined. This may be seen very clearly even in the works of Milton Friedman, the leading advocate of an "empirical definition" of money. As is argued below, when Friedman and his coauthors claim to be defining money empirically they are actually *identifying* the things that satisfy a definition proposed on conceptual grounds.[2]

Another important distinction (discussed, like the preceding one, by Mason 1976, 1979) is between necessary and sufficient conditions. A definition of a thing as complex as money ordinarily lists all of its intrinsic properties. Possession of *any one* of these properties is a *necessary* condition for a thing to be called money, and possession of them *all* is *sufficient*. For example, if we were to follow some introductory textbooks and define money as the things that serve as media of exchange, stores of value, and units of account, then we should have to remember that serving as a store of value is a necessary but not sufficient condition for money, and we would not call a thing money merely because it serves as a store of value. We would have asserted (as an axiom) the proposition, If x is money, then x serves as a store of value. This would not entitle or require us to believe the *converse* proposition, If x serves as a store of value, then x is money. The treatment of a proposition and its converse as equivalent (that is, true or false under the same conditions) is called the fallacy of illicit conversion. It is the most widely committed fallacy in economics.[3]

The second most widely committed fallacy in economics is the fallacy of composition—the assumption that what is true of individuals is true of the aggregate of all individuals. The beginning student learns about this fallacy in her studies of saving and money demand.[4] The fallacy also crops up

2. The leading arguments against the proposed definition and identification are reviewed in section 5 below.

3. This fallacy is very common in works on price theory and economic policy. One of the achievements of price theory is the determination of conditions that are sufficient for the equality of price and marginal cost. Yet it is hard to find a book on price theory that does not emphasize the stringency of these conditions, assert the failure of one or more of them in the "real world," and conclude that price therefore often exceeds marginal cost. This conclusion would follow only if the conditions that fail are *necessary*.

4. An individual can increase his savings out of a given income simply by cutting back on consumption, an act that does not change his income. But if all individuals try to increase their saving in this way, they will find their incomes reduced unless

in certain money definitions, as we shall see below. Thus we find it necessary to distinguish between the individual and the group.

Another important distinction is between the supply (that is, stock) of money and the demand for money. Many recent innovations that increase the liquidity of certain assets or create new liquid assets have almost certainly reduced the demand for money. They are often alleged to have created the need for a new definition of money (see, for example, Gambs 1977 and Wenninger and Sivesind 1979), but this does not follow. A definition of money is about the stock, not the demand. It provides the criterion by which we identify and count up the stock.

We must also distinguish between the definition of money and definitions of the "monetary aggregates" that might appropriately guide or indicate the actions of the central bank. Economists occasionally write about these aggregates in words that make their subject seem to be the definition of money (see Wenninger and Sivesind 1979, for instance), but their real subject soon becomes clear from the discussion. The choice of an aggregate to indicate monetary policy might or might not be closely connected to the choice of a definition of money, but the connection is not so obviously close that the two choices can be treated as one. Though the practice of verbally treating them as one can be confusing, the student is not likely to be misled once the distinction is pointed out, and we shall not consider definitions of "money" that are really about "monetary aggregates."[5]

Nor shall we consider the many (far more than ten) distinct identifications to which the ten approaches to a definition have led. It is pointless to try to evaluate identifications (even if they are often called definitions in the literature) without understanding their putative justifications. A currently popular exercise is to "define" money as a sophisticated weighted aggregate of many liquid assets and to devote highly technical procedures to the determination of the weights. But what is the criterion for judging the aggregate thus defined? It is correlation with GNP. Only if money is defined as "whatever is most closely related to GNP" are such exercises significant for our subject.[6]

Our evaluation of any particular approach cannot be couched in terms of any other approach, for we don't yet know which (if any) of them are useful. Our evaluative criteria can only be those that apply to all good definitions as such: the usage of defining terms is standard, supporting rationalizations obey generally accepted principles of reasoning, and implied identifications are unique. Though none of the ten approaches satisfy all of these criteria, three of them fail only to imply a unique identification and might, therefore, suggest how a satisfactory definition can be reached.

2. Emphasis on tangible media of exchange

It is a considerable surprise to the beginning student when she is told that the larger part of the U.S. money stock consists of transaction balances. She had thought that money was currency (notes and coins) or, in an earlier age, gold or silver. The majority of economists would have agreed with her until well into the 20th century, when the idea took hold (rightly or wrongly) that a given total of currency and transaction balances would have the same macroeconomic effects no matter how it was composed. Yet the identification of money with currency lives on and may be found in the recent writings of two distinguished financial scholars, Fischer Black (1970) and Eugene Fama (1980). Both

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the decrease in consumption is matched by an increase in investment spending. It would be fallacious to argue that because an individual can cut his consumption without causing his income to decline, the whole nation can do the same. Similarly, an individual can increase his money holdings by reducing his spending or by selling other assets, but the aggregate of all individuals does not have this source of liquidity.

5. For extensive discussions of the monetary aggregates, see Federal Reserve Bank of New York (1974) and Board of Governors of the Federal Reserve System (1979).

6. The exercises appeal to aggregation theory and index-number theory for their theoretical justification (Barnett 1980). The final test, however, is in terms of the velocities associated with competing indexes: "Observe that the velocities of the Fisher Ideal and Tornquist-Theil Divisia indices are *identical* to three decimal places, so that the choice between those two indices is of no importance" (Barnett 1980, p. 39). In a later work, Barnett (1982) evaluates competing indexes and various levels of aggregation by a number of empirical criteria (this is "step 3a" in his "stages in the selection procedure"; see especially pp. 700–707). The behavior of velocity—that is, correlation with GNP—figures prominently in the decision.

writers use the word "money" in a way that confines it to tangible media of exchange.[7] Their articles, though differing in several matters of detail, are sufficiently alike to be treated as representatives of the same view of money, and we shall confine the discussion to Fama (1980).

The main question asked in Fama's article is whether the nature of banking is such that governmental regulation is necessary for economic stability, and the answer given is that no such regulation is necessary. As the article is not mainly about money, it offers no explicit definition of the word. Yet the word appears many times, and its usage and the context of its usage suggest what money is thought to be.

> We take the main function of banks in the transactions industry to be the maintenance of a system of accounts in which transfers of wealth are carried out with bookkeeping entries. Banks also provide the service of exchanging deposits and other forms of wealth for currency, but in modern banking this is less important than the accounting system of exchange. Moreover, although both can be used to carry out transactions, one of our main points is that currency and an accounting system are entirely different methods for exchanging wealth. Currency is a physical medium which can be characterized as money. An accounting system works through bookkeeping entries, debits and credits, which do not require any physical medium or the concept of money. (Fama 1980, p. 39)

Fama continues by considering what banking would be like if banks were not regulated. "This case," he says,

> provides the clearest view of the characteristics of an accounting system of exchange and of the fact that the concept of money plays no essential role in such a system. . . .
>
> . . . In brief, banks pay competitive returns on deposits, that is, they pay the returns that would be earned by depositors on securities or portfolios that have risk equivalent to that of the deposits, less a competitively determined management fee; and banks charge for the transactions services they provide, again according to the competitively determined prices of these services. (1980, p. 40)[8]

Fama then describes the method of paying for goods in the system of free banking:

> Thus, when one economic unit wishes to transfer a given amount of wealth to another, he signals his broker-banker with a check or some more modern way of accessing the bank's bookkeeping system. The broker-banker debits the sending account and the same or another broker-banker credits the receiving account for the amount of the transaction. The debit to the sending account generates a sale of securities from the portfolio against which the sending depositor has claim while the credit to the receiving account generates a purchase of securities for the portfolio against which the receiving depositor has claim. All prices, including prices of securities, are stated in terms of a numeraire, which we have assumed is one of the economy's real goods, but the numeraire never appears physically in the process of exchange described above. The essence of an accounting system of exchange is that it operates through debits and credits, which do not require any physical medium. (1980, p. 42)

Fama concludes his discussion with the following speculation:

> Suppose we have a completely unregulated banking system . . . and an advanced society in which it is economic to carry out all transactions through the accounting system of exchange provided by banks. The system finds no need for currency or other physical mediums of exchange, and its

7. Black writes, "For the moment, let us suppose that all payments in this simpler world [of unregulated banking] are handled by check or credit card, and that currency is not used. In this world, money does not exist" (1970, p. 12). It is true that after admitting currency into the system, he still insists that money does not exist: "Currency alone can hardly pass for the whole of money. . . . So even when currency is added to our model, the quantity of money can have no effect on output, employment or prices, because the quantity of money does not exist" (p. 14). But as this passage is self-contradictory (stating in one breath that there is more to money than currency and in the next breath that there is no money), we rely on the first quoted passage as the expression of Black's view.

8. Substantially the same sentiments were expressed by Black (1970).

> numeraire has long been a real good, say steel ingots. The society is so advanced that terms like money, medium of exchange, means of payment, and temporary abode of purchasing power have long ago fallen from its vocabulary, and all written accounts of the ancient "monetary age" were long ago recycled as part of an ecology movement. (1980, p. 55)

The freedom of banks (subject to competition) to select their portfolios, choose the services they provide, and establish their fees in the "ideal society" would surely lead them to undertake different actions than banks do today. This does not mean, however, that the payments system would differ essentially from our present system.

Fama emphasizes two features of that "ideal" payments system. First, all payments would be made through the accounting system maintained by banks; second, banks would charge explicit fees for maintaining the accounts and pay competitively determined rates of interest for the balances in the accounts. Both features represent quantitative differences from our present payments system. Not all, but only most, of our payments are made through the accounting system (that is, by check), and a substantial (but declining) part of the compensation of banks for their payments services and of depositors for their balances is implicit. Restrictions on interest payments for balances lead banks to compete for balances by underpricing their services. Part of the compensation of depositors is thus implicit in the banks' subsidization of their use of the payments system; part of the compensation of banks is implicit in the depositors' forced subsidization of their use of balances. This is a barter arrangement: banks barter the unpriced part of their payments services for the use of the unpriced part of their depositors' balances.

The differences between our system and the "ideal" system are the degree to which currency is used for payments and the degree to which the compensation of banks and depositors is implicit. These quantitative differences aside, the systems "look" very much alike insofar as they bear on the meaning of money. Therefore, if the balances in the accounting system of exchange are not money, then neither are the transaction balances in our present system. Only currency is money. This is the definition implicit in Fama's account of a free banking system, and as we have just seen, it applies equally to our present system.

To say that the implicit definition applies equally to both systems means that it applies to both if it is an appropriate definition and that it applies to neither if it is an inappropriate definition. The appropriateness of the definition is independent of Fama's account of a free banking system, which is by far the most valuable contribution of his article and may be accepted or rejected without accepting or rejecting his notion of money.

Since the only reason given for not calling the transaction balances money is that, unlike currency, they are not "physical" (that is, tangible), the question is, Must something be tangible in order to be money?

Consider the following thought experiment. Imagine a village on the American frontier, so far removed from "civilization" that it is an economy unto itself. Trappers, farmers, and artisans sell most of their wares to the Storekeeper, who in turns sells them to others. All goods are valued in .30-caliber bullets, so this bullet is the unit of account. The Storekeeper has created tokens (which no one can counterfeit) consisting of notes and coins denominated in Bullets. When the Storekeeper buys things from the people he pays them the Bullets-worth of the goods in tokens, and when he sells he requires the buyers to hand over the Bullets-worth in tokens. When the people buy and sell from each other, they use these same tokens. The tokens, though denominated in Bullets, are not redeemable for them; they are redeemable, at the store, for goods having the same Bullet value.[9] The Bullet values of goods are determined by supply and demand as sensed by the Storekeeper, who thus functions as a Walrasian auctioneer. If corn is 10 Bullets a bushel, for instance, and the Storekeeper finds it accumulating in his storeroom, he reduces his buy-

9. Redeemability of the tokens in goods does not limit their issue. The Storekeeper can obtain goods with which to redeem outstanding tokens by issuing new tokens. Only if the Storekeeper faced competition in the "token industry," so that the people could easily turn away from his tokens and use those of other issuers, or if he were obligated to redeem them in goods at a fixed Bullet price, would his issues be constrained. If neither of these provisions held, he would be able to function as a modern central bank.

ing and selling prices sufficiently to reduce his inventory to the desired level. (The Storekeeper's buying and selling prices differ by his cost of operating the store. People are able to "beat the spread" by trading among themselves, but search costs and other transaction costs, such as grading corn and beaver skins, are sufficiently high to keep the Storekeeper in business.)

Most economists (including Fama and Black, I think) would call this a monetary economy; its money consists of the tokens, is counted in Bullets, and amounts to the outstanding total Bullets-worth issued by the Storekeeper. How does it differ if the Storekeeper, instead of issuing tokens, keeps a ledger in which he credits the people for the Bullets-worth of their sales to him, debits their balances for the Bullets-worth of their purchases from him, and allows them to transfer balances to other people at will? Is more or less corn grown? Is trading in any good greater or smaller? Clearly not. The *real* economy is the same. Moreover, if it was a monetary economy when its payments were made by surrendering tokens, it is still a monetary economy when its payments are made by transferring balances in the ledger. These balances are its money, for they do all, and only all, of the things otherwise done by tokens. The people pay for goods with the balances, receive their sales revenues in them, and hold purchasing power in them. And if the Storekeeper increases the balances against himself by purchasing more goods (or by lending to someone), the economic effects are exactly the same as they would be if he issued an equal Bullets-worth of tokens. The intangible balances function in exactly the same way as the tangible tokens. Tangibility, we conclude, is just not a criterion of money.

3. Emphasis on liquidity

Running through the literature on monetary theory and policy during the past 20 years are two themes related to the trade credit granted by merchants and manufacturers and the debts issued by nonbank financial intermediaries (NFIs). One theme concerns the effects of trade credit and NFI debts on spending. The debts are very liquid assets to their holders and can be cashed in at short notice in order to pay for goods; the trade credit enables the grantees to obtain goods without parting with cash. Therefore, it is urged, a lack of cash does not hinder the spending of households and businesses. In particular, a change in the money stock need have no effects on spending: an increase in money might be used to pay off debt or to restore liquid asset holdings, and a decrease might be offset by recourse to trade credit or by cashing in liquid assets. In other words, spending is not constrained by money but by "liquidity."

The second theme, urged as an implication of the first, is that variations in trade credit and NFI debts can defeat the attempts of central banks to manipulate the money stock in order to affect economic activity. Monetary policy cannot focus on money but has to attend to the entire range of liquid assets and credit arrangements.

Both themes can be traced back 150 years to the "Banking School" controversy and beyond.[10] Their reemergence in the past two decades is largely a consequence of John Gurley and Edward Shaw (1960) and the Radcliffe Report. They rest on the fundamental proposition that "liquidity," not money, is the prime determinant of spending:

> A decision to spend depends not simply on whether the would-be spender has cash or "money in the bank", although that maximum liquidity is obviously the most favourable springboard. There is the alternative of raising funds either by selling an asset or by borrowing. . . .
>
> . . . [S]pending is not limited by the amount of money in existence; but it is related to the amount of money people think they can get hold of. (Radcliffe Report, pars. 389-90)[11]

It is this fundamental proposition that concerns us,[12] for it is frequently alleged to hold implications for the definition of money: Is there any point in caring about the definition of money if money, as such, is unimportant? Alternatively, if we insist that money *is* important, aren't we forced to define it

10. See Schumpeter (1954, chap. 7) and Wood (forthcoming) for interesting discussions of this controversy. A more recent controversy, related to this one, concerns the question of whether commercial banks are unique. See Wood (1970) for a review and a possible resolution.

11. See U.K. Parliament (1959).

12. We cannot pause to consider its alleged implications for monetary policy. See the interesting and enlightening discussion by Wood (1981a).

broadly enough to capture the liquidity available from the whole range of sources including trade credit and NFI debt? Wouldn't a useful definition of money necessarily encompass that liquidity?

A number of economists have answered this question in the affirmative and have produced definitions of money that include a range of liquid assets in varying proportions with the medium of exchange.[13] None of them claim that the liquid assets, included with the medium of exchange in the proffered definition of money, can actually be spent. The claim is just that the assets can be too easily converted into the medium of exchange to justify their neglect when trying to define money in a meaningful way. If money is to retain its classical meaning as a prime determinant of spending, then it must be defined much more broadly than as the medium of exchange.

We need not linger long over this approach once we recall the difference between the individual spender and the aggregate of all spenders. An individual spender can indeed outspend his cash in any period, even a very short period, by borrowing or liquidating assets. When interpreted on the individual level, the quoted passage of the Radcliffe Report is true. It is not true, however, when interpreted on the aggregate level. For every borrower there is a lender; for every individual liquidating an asset there is another individual buying or redeeming that asset and surrendering cash. For every individual overspending his cash there is a second individual underspending his. The excess spending of the first is matched by—indeed, made possible by—the spending voluntarily withheld by the second.[14] Aggregate spending power does not change.

It is true that aggregate spending is not uniquely determined by the aggregate quantity of cash. Velocity is also a factor. But velocity, while far from being a constant, is by no means a perfectly adjustable residual that can take on whatever value is required by the equation of exchange while total spending and total cash vary arbitrarily.[15]

In any case, the argument of those who advocate "liquidity" definitions of money does not turn on the variability of velocity. (For any given definition there will be an associated velocity, which might or might not vary more than the velocity of cash.) The argument is not that cash fails to constrain spending *uniquely*; it is that cash fails to constrain *at all*. This is the reason put forth for a broader definition of

13. See Friedman and Schwartz (1970, pp. 178–88) for a partial survey and favorable comments.

14. The second individual does indeed "spend" on assets. The context of our argument confines spending to goods. Note that my usage of "cash" in this section is intended to conform to that of the Radcliffe Report—that is, it covers "money in the bank" as well as currency.

15. The equation of exchange states that total spending on goods (E) equals the product of total cash (M) and the income velocity of cash (V). The equation is an identity, but this does not enable it to be satisfied by arbitrarily chosen values of E and M. Velocity is variable but only within limits. Williams (1938) puts it well:

> [B]oth producer and consumer are obliged to restrict the velocity of circulation of money coming into their hands, and neither can spend his income with indiscriminate speed. The producer, on his part, when he collects his receivables, must hold the proceeds in cash in order to meet his pay roll at the end of the week or month; if he should chance to collect his money one day earlier or later, he must then hold on to it one day more or less, because always he must pay his wages on the same day of the week or month; hence the process of meeting the pay roll, which is one of the most important uses for money, becomes at the same time a process for stabilizing the velocity of circulation of money. The consumer, on his part also, when he receives his wages, must hold the proceeds in cash at first and must spend the money only a little at a time, in order to make sure that it shall last until the next pay day, so that his family shall not have to go hungry for the last day or so; if he spends rapidly at first, he must spend all the more slowly later; hence the process of buying the family supplies, which, like that of meeting the pay roll, is one of the most important uses for money, becomes at the same time a process for stabilizing the velocity of circulation of money.
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> The economic mechanism may be likened to a watch that keeps time properly because it contains a balance wheel and hairspring, actuated by an escapement, which together prevent the mainspring from unwinding more than just so fast. In the economic mechanism the pay-roll envelope and the housewife's purse are the two pallets on the escapement lever. (Quoted by Kohn 1981, p. 180)

And even in hyperinflations, when purchases are speeded up as much as possible in order to beat the next price increase, so that the "week or month" mentioned by Williams becomes a "day," velocity still cannot accommodate infinite expenditure. "The continued existence of some constraint is witnessed by the second most notable phenomenon in a hyperinflation—the acute shortage of means of payment" (Kohn 1981, p. 190, n. 22).

money.

A recent article by Meir Kohn (1981) deals with the argument at length. Kohn constructs a number of theoretical models intended to clarify the effects of borrowing and lending on aggregate spending. For each model he derives an aggregate spending constraint in terms of aggregate cash and its velocity. Though Kohn is not explicitly dealing with the matter of money definitions, his work bears on the matter indirectly. In showing that cash (amplified by velocity) constrains aggregate spending despite the existence of liquid assets and credit arrangements, he disarms those who would define money broadly *because* only thus defined could it constrain spending. That is, he has removed their announced justification for a broad definition. The justification is, in fact, a simple fallacy of composition.

4. Three approaches that emphasize the means of payment

4.1 Unqualified emphasis on the means of payment

Money has been defined as that which routinely serves as means of payment in organized markets. This definition, proposed by Robert Clower (1971), requires us to answer three questions in order to identify money. First, what do we mean by "payment"? Second, what markets ought we to regard as organized? Third, what things routinely serve as means of payment in such markets?

Clower himself raised the second and third questions and suggested how they might be answered:

> I do not wish to minimize the difficulty of these questions, but in my opinion both can be answered satisfactorily in relation to the objectives of any given investigation by direct inspection of trading patterns and payment procedures in various sectors of the economy. For the United States and the United Kingdom, for example, it seems clear that for most practical purposes, "money" should be considered to include trade credit as well as currency and demand deposits. (1971, p. 18)

Though he did not raise the first question (what do we mean by "payment"?), he offered an answer to it in a footnote to the passage just quoted:

> The essential issue here is whether the tender of any given financial instrument permits a buyer to take delivery of a commodity from a seller. On this criterion, trade credit qualifies as money—trade credit being interpreted to include credit card and overdraft facilities, department store credit and travellers' checks, as well as commercial paper and book credits. On the same criterion, time deposits and other financial claims that are perfect or near-perfect substitutes for money only as stores of value unambiguously fail to qualify as money. (Ibid., n. 9)

Thus you've "paid" when you've been permitted to take delivery, and money is anything with which you can pay in this sense.

Clower's answer to the third question is the most striking feature of his definition, and it has encountered objections. G. L. S. Shackle commented as follows:

> Definitions in words are necessarily circular, and will not get us anywhere unless at some stage we can point at something visible to everyone, or else say "You all know what is meant by" such-and-such a term. *Payment* may perhaps be such a term. Payment has been made when a sale has been completed. Payment has been made when the creditor has no further claim. Payment is in some sense final. Those are still only verbal shots. But after all, does not any person know when and whether he has been paid? . . .
>
> . . . The plea that I had paid my debt by creating it will not be accepted. Trade credit is not the *completion* of an exchange, it is merely the postponement of the completion. If we accept the definition that money is a means of making payments, it seems to me plain that we cannot include trade credit. Trade credit, the *process of increasing* trade credit, is the *putting off* of the making of payments. But the evil day will come. (1971, pp. 32-34)

If a tailor delivers a $100 coat to a haberdasher and grants him credit for 60 days, Shackle would say that payment is not made until the debt is discharged. Clower, however, would say that payment was made on delivery. Clower's usage admits into the category of money things that do not exist prior to their use as such. One hundred dollars of "Clower money" comes into existence when the tailor grants trade credit and goes out of existence 60 days later when the haberdasher discharges his debt. On the Clower definition, money is not

something that must be held by someone prior to its use in exchange.

The quarrel is not mainly about words but about economics. The $100 of Clower money that exists for 60 days has not the same effect on the economic system as a $100 increase in the stock of currency or bank deposits. It might seem that way to the *haberdasher*, who, having got the coat without parting with $100, has $100 to spend on something else; to him, it is as if the money stock rose by $100. But to the *tailor*, who has given up the coat and is still waiting for his $100, the money stock might as well have fallen by $100. To the two of them as a whole, it is as if the money stock did not change even though $100 of new Clower money existed for a while.

It is true, and well known, that the existence of trade credit affects the demand for money and hence the velocity of money and therefore the economic consequences of a given quantity of money. But the effect is not one-for-one, and to treat it as if it were one-for-one is to adopt the point of view of the haberdasher while ignoring that of the tailor. For while the existence of trade credit allows the haberdasher to reduce his demand for money, it forces the tailor to increase his—or if not the tailor, then the weaver or the sheep farmer.

4.2 Emphasis on the means of simultaneous payments

Money has been defined, by Shackle (1971), as that which serves as the means of strictly simultaneous payments. The stock of money, says Shackle,

> is equal to the total of all those payments which could be made without the payers receiving or counting on the payments to be made by others. Simultaneity must be insisted on here, lest we mix up quantity and velocity. A single coin circulating fast enough can carry a payments flow of unlimited size. In thus defining the size of the stock of money, we must require all payments to wait for the gun and each of them to be represented, when the gun goes off, by its value in coins or something equally unconditional. (1971, p. 32)

Shackle goes on to aver that coins, notes, and transaction deposits are clearly money. In the United Kingdom, time deposits at banks are money, too. Though the owner of such a deposit cannot write a check on it, he can write a check on his demand account in the same bank and the check will be honored even if his demand account is empty so long as his time-deposit balance is sufficient to cover the check. (The depositor loses seven days' interest on the amount thus transferred from his time deposit.) Time deposits at British banks are very similar to automatic transfer service accounts at U.S. banks. Ordinary time deposits at U.S. banks, however, cannot be accessed in this manner and do not count as money according to Shackle. The same is true of time deposits at thrift institutions in the United States and the United Kingdom.

Shackle does not count trade credit as money. As we saw above, he regards trade credit as the *postponement*, not the completion, of payment. He does, however, count bank overdrafts as money.

> [A] man can just as well make a payment by increasing his overdraft (if he has his banker's permission to do so) as by reducing a credit balance. Unused overdraft permission, "lines of credit", ought to be included in the stock of money on the same footing as coins, notes and bank deposits, if we are using as our definition of money "the means of making payments". (1971, p. 33)[16]

Why this distinction between trade credit and bank overdrafts? It is clearly not useful in the case where an overdraft is used to pay for goods or services supplied by the *bank*, for then the overdraft is just ordinary trade credit. But that is not all. The distinction between trade credit and a bank overdraft—between a line of credit granted to a haberdasher by a tailor and a line of credit granted to the haberdasher by his banker—seems to arise from a focus on the goods market to the exclusion of the debt market. Consider two cases. In *Case 1*, the haberdasher gets trade credit and pays the tailor 60 days later. He enters into two transactions simultaneously and a third transaction later: he buys the coat from the tailor, simultaneously sells a liability to the tailor, and then 60 days later repurchases his liability from (discharges his debt to) the tailor. Since it was the third transaction that completed his payment for goods, his use of trade credit in the meantime was not, according to Shackle, a use of money. Money appeared only when used to discharge the debt—that is, when used to complete

16. See Keynes (1930, vol. 1, bk. 1) for a similar statement.

the payment for goods. In *Case 2*, the haberdasher pays the tailor immediately by drawing on his line of credit at a bank. Let him repay his banker 60 days later. Just as in Case 1, then, he enters into two transactions simultaneously when receiving the coat and a third transaction 60 days later: he buys the coat from the tailor, simultaneously sells a liability to the bank, and then in 60 days repurchases his liability from the bank. And, just as in Case 1, the whole set of transactions is not completed until 60 days pass.

The only difference in these cases is the source of credit. In Case 1, the source is the tailor;[17] in Case 2, it is the bank. If our view is so narrow as to encompass only the goods market, we may disregard the haberdasher's debt to the banker and focus only on his use of the banker's money to pay the tailor. On this view the relevant transaction is completed immediately. But if our view is broad enough to encompass both the goods market and the debt market, the immediate payment to the tailor is not the end of the story. On this view the relevant transaction is more complex and is not completed immediately. Though bank credit might be part of the means of simultaneous payment in the goods market, it is not part of the means of simultaneous payment in the goods and debt markets regarded as a whole. In this amalgamated market, payment is not complete until the haberdasher repays his loan with money obtained elsewhere. This part of the total payment is waiting on, or counting on, some other payment.

The bank plays no special role in this analysis. Substitute the haberdasher's uncle, and let the haberdasher pay the tailor with funds borrowed from his uncle. The same story ensues.

Thus bank overdrafts are means of simultaneous payment, and therefore satisfy Shackle's definition of money, only if we concentrate on payments in the goods markets. If, however, we consider payments in the whole economic system, bank overdrafts do not satisfy the definition.

In Shackle's emphasis on the means of simultaneous payments, we have finally encountered an approach free of obvious fallacies or curious usage. The concept of simultaneous payments is more complex than it appears, however, and will have to be analyzed further.

17. More likely, it is the tailor's bank, which has granted him a line of credit so that he in turn can grant trade credit to the haberdasher.

4.3 Emphasis on means of payment that do not create further obligations

Money has been defined as that which can routinely be exchanged for goods without creating a debt and a repayment obligation. This definition, proposed by Harry Johnson (1971), implies that currency and transaction deposits are money and that trade credit is not. Bank overdrafts are not money even on the view that concentrates exclusively on the goods markets, for they create a repayment obligation. Debt *can* be used as money by the issuer if (like the currency issued by governments and central banks) it never has to be repaid. When private banks were allowed to issue notes, their notes became part of the money stock (as defined by Johnson) upon acceptance by the public. Today, bank and nonbank travelers' checks are money on this definition because they are routinely accepted in exchange and, when used by the public, do not create obligations against it.

Johnson proposed this definition in opposition to Clower's definition that included trade credit as money. Johnson's main objection centered on Clower's unusual use of the word "payment," and he apparently framed his definition in the stated form in order to ensure that "payment" has its usual meaning when applied to exchanges of money for things. His definition has the further consequence of ensuring that money is something that has to be held prior to its exchange for goods (unlike trade credit, for example). Thus his definition does not share the property of Clower's, that (some) money may come into existence when exchanged for goods.

Johnson's definition does, however, share one interesting property with Clower's: the quantity of money can rise or fall when one form of money is converted into another. Consider what happens when a person buys a $100 coat and pays with a nonbank traveler's check. At that moment (as at every moment since the person bought the traveler's check from the issuer), the quantity of Johnson money is ($M + T + \$100$), where M is the total of currency and transaction deposits held by the public and T is the total of other travelers' checks outstanding. When the haberdasher sends the traveler's

check to the issuer, he will get $100 of the money in M from the issuer. The traveler's check then goes out of existence, and the quantity of money falls to $(M + T)$. One hundred dollars of Johnson money has disappeared upon this simple conversion. On some views, this property of Johnson's definition is a defect.

5. Emphasis on the relation between money and GNP

The attempt to define money as the set of liquid assets that is most highly correlated with some nominal measure of aggregate economic activity, such as gross national product or national income, derives from Milton Friedman and David Meiselman. In their 1963 article, Friedman and Meiselman (F&M) were not primarily concerned with the definition of money but with the explanatory power of two simple linear equations:

(1) $$Y = a_1 + b_1 M$$

and

(2) $$Y = a_2 + b_2 E,$$

where the a's and b's are unknown constants, Y is national income, M is money, and E is autonomous expenditures. Taking equation 1 to represent the Quantity Theory and equation 2 to represent the Keynesian income-expenditure approach, F&M wished to ascertain which one fit the data better. But what data? That is, how should the variables be defined?

> One by-product of this investigation was the discovery that there is neither clear-cut agreement on the specific statistical definition of autonomous and induced expenditures nor any well established criteria for choosing particular definitions for a particular problem or period or body of data. This state of affairs is rather surprising in view of the mountains of literature on income-expenditure relations, and the large extent to which the appeal of the relations has derived from the appearance that they can be expressed in immediately measurable and operational terms in data contained in the national income accounts. A parallel problem of long standing is the definition of M. Should money be defined as consisting of currency alone, or of currency plus deposits? . . . If money is to include both currency and deposits, should it include demand deposits alone, or should it include also commercial bank time deposits? Time deposits in mutual savings banks? Savings and loan association shares? And so forth. . . .
>
> In our actual empirical work, much the greatest amount of time was spent in trying to draw the appropriate boundary lines rather than in the calculations and analysis designed to compare and test the two hypotheses. We are by no means satisfied that we have used the appropriate criteria in drawing the lines. Neither are we satisfied with the precise lines we have drawn, some of which we regard as highly tentative. . . .
>
> What criterion should be used to fix the boundary lines? One simple method is to correlate alternatively defined measures of the independent variable with the dependent variable and then select the concept which yields the highest correlation. The argument for this procedure is that the precise empirical definition of variables should be selected so as to put the theory in question in its best light. For example, since it is not possible *a priori* to make any judgment about whether commercial bank time deposits should be regarded as part of the money supply, it seems plausible to decide this question by correlating (a) currency plus demand deposits and (b) currency plus demand deposits plus commercial bank time deposits with one or more alternative definitions of income. If (b) should consistently be more highly correlated with income, then this criterion would suggest using the more broadly defined money supply in testing the stability of velocity. (Friedman and Meiselman 1963, pp. 180–81)

F&M observe, however, that this simple appoach encounters the danger of spurious correlation:

> Suppose that the broader monetary total has a higher correlation with income than the narrower. The correlation between time deposits alone and income may then be (1) higher than either or (2) lower than one or both. Suppose it is higher than either. The higher correlation of the broader than of the narrower total with income may reflect simply the inclusion of an item highly correlated with income (namely, time deposits) rather than the inclusion of a substitute for the other items; it may reflect determination of the level of time deposits by the level of income and not the converse.
>
> To put this point differently, the appropriate

> reason for including time deposits is not simply that they are highly correlated with income but that they are such close substitutes for the other monetary items that it is preferable to treat them as if they were perfect substitutes than to omit them. But if time deposits were perfect substitutes for the other items, shifting a dollar from time deposits to the other items would have no effect on Y. For example, consider shifts of deposits from banks with an even number of letters in their legal names to banks with an odd number of letters for a given total of deposits in the two together. Such shifts will clearly have no effect on the level of money income. This suggests that an appropriate criterion whether time deposits are sufficiently close substitutes for other items is whether income is more highly correlated with their sum than with each component separately; whether, that is, (2) of the preceding paragraph holds, in which case time deposits should be included, or (1) does, in which case they should not be. (1963, p. 182)

Finding that possibility 2 held for their sample period, F&M defined money as currency plus demand and time deposits of commercial banks (called M2 at the time they wrote).

The quoted passage makes clear the expedient character and secondary importance of F&M's money definition, as well as their uncertainty about the proper approach to their primary task. Yet there is no doubt that in this passage they gave birth to two unfortunate ideas: (1) that the definition of money is an empirical matter[18] and (2) that the main criterion for a money definition is a high correlation with national income. The first is simply a confusion between the definition of a concept and the identification of the things thus defined. It is the identification, not the definition of money, that F&M propose to accomplish empirically. Their definition, like all definitions, is conceptual.

The F&M definition in terms of a close relation to national income is open to criticism on a number of grounds. First, and most obviously, it fails to define uniquely. F&M found income most closely related to old M2, but they examined only a few of the candidates for the designation of money and only one measure of the relation between money and income (simple correlation of contemporaneous levels). Subsequent investigations have turned up an embarrassing number of competing identifications. Many of these investigations deal with income velocity (income—or more commonly, GNP—divided by "money"), since a close relation between "money" and GNP implies a stable income velocity. Ott (1982) found that while the velocity of M2 was almost constant from 1959 to 1981, the velocity of M1 grew at nearly a constant rate. Which should be called money? Kopcke (1983) found the velocity of "debt" (total nonequity funds raised in credit markets by nonfinancial borrowers) to be stabler than that of (new) M1, M2, M3, or L from 1960 to 1982. Should "debt" be called money? Cullison (1982), comparing new M1 with high-powered money, found the former to be more highly correlated with GNP but the latter to be a better predictor of GNP outside the sample period.[19] Kaufman (1969) examined the correlations of a number of sets of liquid assets with GNP *lagged* for k quarters ($k = 0, 1, 2, 3, 4$) during the years 1953–56. With no lag or a lag of one quarter, GNP correlated most highly with M1, but with lags of two, three, or four quarters, GNP correlated most highly with M2. Which lag is appropriate?[20]

The second major criticism of the F&M approach questions the relevance of high correlations. Leland Yeager puts it well:

> [E]ven if money defined to include certain near-moneys does correlate somewhat more closely with income than money narrowly defined, that fact does not necessarily impose the broad definition. Perhaps the amount of these near-moneys depends on the level of money income and in turn on the amount of medium of exchange. . . . More generally, it is not obvious why the magnitude with which some other magnitude correlates most closely deserves overriding attention; it might be

18. See Yeager (1968), Melitz and Martin (1971), and Mason (1976) for a cross section of the criticisms of the F&M "empirical definitions" of money.

19. Neither Cullison nor Ott was searching for a money definition. Kopcke spoke as if he were but was evidently concerned with the choice of a monetary target. Schadrack (1974) was professedly and (I think) actually searching for a money definition (he found old M2 where he looked).

20. For a discussion of several studies of the correlation between "money" and GNP, see Friedman and Schwartz (1970, pp. 178–88).

> neither the most interesting nor the most controllable one. The number of bathers at a beach may correlate more closely with the number of cars parked there than with either the temperature or the price of admission, yet the former correlation may be less interesting or useful than either of the latter. The correlation with national income might be closer for either consumption or investment than for the quantity of money; yet the latter correlation could be the most interesting one to the monetary authorities. (1968, p. 46)

Thirdly, even if the definition of money in terms of correlation with GNP is prompted by a search for a "money" with which the central bank can stabilize economic activity, it still cannot be determined by the F&M approach. As James Tobin observes,

> These statistical relationships are an indecipherable hybrid of supply and demand functions, a mixture of the economy's responses to Fed policies and the Fed's responses to the economy's movements, an amalgam of behavior by banks, firms, households, and policy makers. Looking for the best correlate of GNP and then trying to use it to control GNP is probably the way to make sure it is no longer the best correlate of GNP. (1980, p. 323)

Finally, the approach emphasizing correlation with GNP rests on the fallacy of illicit conversion. The proposition that Friedman and his various coauthors accept can, at the risk of some oversimplification, be expressed as, If x is the money stock, then over the long run x bears a very close relation to nominal GNP.[21] Friedman would surely not confound this proposition with its converse, If x bears a close relation to GNP over the long run, then x is the money stock. Yet this is precisely what his approach to the definition of money entails. Even if we granted that a close relation to nominal GNP is a *necessary* condition for money, we couldn't *identify* money in terms of correlation unless the condition were also *sufficient*.

6. Emphasis on stability of the demand function

A fundamental tenet of monetarism is that the private sector is far stabler than the public sector, so that economic instability often arises from—and is nearly always amplified by—the operations of government.[22] Monetary instability, in particular, usually results from destabilizing actions by the central bank rather than the behavior of private parties. Furthermore, any monetary instability that may properly be attributed to private actions arises from the supply side rather than the demand side, owing mainly to fractional-reserve banking (and, however, amenable to control by the central bank). Monetary instability is not a demand-side phenomenon because the demand for money is stable; that is, the quantity demanded is a stable function of a few variables.

The statement "The demand for money is stable" invites interpretation as an empirical proposition about the demand function: it is true if the function is stable, false if the function is not stable. To test the statement we should have to define money, deduce the form and arguments of the demand function, specify the meaning of stability, and try to ascertain whether the function is stable. But suppose that, for whatever reason, we have already decided to accept the statement as true: we believe so firmly in the stability of money demand that no purported test can change our minds. Then the statement is not an empirical proposition about money demand. It is an implicit definition: of money or demand or stability. One (or more) of these terms must be defined in a manner that makes the statement true. In particular, we could define money as that (set of liquid assets, presumably) which has a stable demand function.

No one recommends this approach in explicit terms. Many, however, follow it implicitly, and it is deeply embedded in the literature. Consider the following passages from David Laidler, a leading student of the subject:

> One may distinguish three broad views of what is "money" in the United States economy. First there

21. This proposition follows from the equation of exchange, together with the assumption of a reasonably stable income velocity. The proposition was central to monetary thought from about 1750 to World War II. But for most of the two decades following the war, Friedman was virtually alone in arguing that "money matters." The proposition is, of course, widely accepted today.

22. See Mayer (1978) and Wood (1981*b*).

> are those who cling to the traditional concept of currency in the hands of the public and demand deposits at commercial banks, and second, there are those who argue that time deposits at commercial banks are such a close substitute for demand deposits that they should be included in the quantity of money which the authorities must manipulate in attempting to influence the level of economic activity. Proponents of both of these points of view . . . find themselves opposed to those who argue that the liabilities of certain nonbank financial intermediaries, particularly savings and loan associations and mutual savings banks, are such close substitutes for commercial bank liabilities as to require their inclusion in the "money stock." . . .
>
> As we shall see, the empirical element in the debate has tended to center on the question of whether a useful definition of money should include time deposits at commercial banks, or whether the more traditional concept is adequate. . . .
>
> . . . If the traditional notion proves adequate in competition with a money concept that includes time deposits, the issues . . . are virtually settled by default and in favour of a traditional view of what is money. . . . *If it turns out that a stable demand function for money, defined to exclude [the other] assets, can be identified, then there would appear to be no pressing need to introduce them into the definition of money.* . . .
>
> The issues at stake are as follows. First, are time deposits sufficiently close substitutes for demand deposits to warrant treating them as the same asset? Second, if the answer to the first question is yes, is it also the case that the liabilities of other financial intermediaries are sufficiently close substitutes for those of commercial banks to warrant treating them as the same asset? Now one can only define what is meant by a "sufficiently close substitute" if he will specify the problem with which he wishes to deal, and *as far as the definition of money is concerned the most important issue has been the identification and measurement of a stable aggregate demand for money function.* (1969, pp. 509, 510, 515; emphasis supplied)

Nowhere in these passages (or elsewhere in the article that contains them) does the author explicitly propose to define money as that which has a stable demand function. But that this is his definition is clear from the italicized passages; and that he feels no apparent need to state this definition explicitly—as if the matter were clear to all and nothing remained to be said[23]—is testimony to its deeply ingrained acceptance.[24]

In discussing this definition, we will find it useful to deal briefly with a number of the questions raised by the quoted passages. (1) What is meant by a stable demand function? (2) Why is a stable money-demand function desirable? (3) What has stability of the demand function got to do with substitutability among assets? (4) Why is the investigation of substitutability confined to deposits at financial institutions? (5) What do we know about this substitutability? (6) Finally (our main question), what has all this to do with the definition of money?

1. What is meant by a stable demand function? The literature has virtually reached a consensus on the meaning of stability in this connection, as summarized by Judd and Scadding: "In sum, a stable demand function for money means that the quantity of money is predictably related to a small set of key variables linking money to the real sector of the economy" (1982, p. 993).

2. Why is a stable money-demand function desirable? The consensus in the literature (see, for example, Laidler 1969, p. 509; Laidler 1977, pp. 33–35; and Judd and Scadding 1982, pp. 993–94) is that a stable money-demand function is a precondition for an effective monetary policy. If the demand function is stable, monetary policy can be effective merely by avoiding actions that destabilize the money supply. But if the demand function is unstable, monetary policy must try to accommodate it with frequent changes in supply. This latter task is universally recognized as more difficult than the former and is, on some views (such as those of the Monetarists and the Rational Expectationalists), impossible in practice.[25]

23. Laidler does, indeed, speak as if the proper "definition of money" were problematical, but what he is really talking about is its proper identification. The discussion of identification is quite explicit; that of the *criterion* for identification is implicit.

24. Later work of Laidler's—see Laidler (1977), especially pp. 149–52—manifests the same approach. See also Willbratte (1975), Lothian (1976), and Wenninger and Sivesind (1979).

3. What has stability of the demand function got to do with the substitutability between demand deposits and other assets? If some asset, *A*, is a very good substitute for demand deposits and we fail to include the yield on *A* as an argument in the demand-for-money function, changes in this yield will induce changes in the relation between money demand and its other arguments, making the function appear to be unstable.

4. Why is the investigation of substitutability confined to deposits at financial institutions? No good reason. More recent research has considered broader classes of assets, including Treasury bills (Goldfeld 1973; Hafer and Hein 1979), common stock (Hamburger 1977), commercial paper (Hafer and Hein 1979), and government bonds (Hafer and Hein 1979).

5. What do we know about this substitutability? Very little. The enormous quantity of empirical research into this subject (see Laidler 1977, Feige and Pearce 1977, and Judd and Scadding 1982 for surveys) had, by 1973, produced a consensus centered on the Goldfeld (1973) money-demand equation. But since 1974 the Goldfeld equation has performed so poorly in predicting money holdings[26] that the consensus has vanished (see Enzler, Johnson, and Paulus 1976 and Goldfeld 1973 for discussions). Many explanations of this poor performance have been proposed (most of them are surveyed by Judd and Scadding 1982), but the most compelling is surely that of Cooley and LeRoy (1981).

Cooley and LeRoy argue as follows. *First*, the current state of economic theory does not yield a money-demand function that is specified tightly enough for statistical estimation. In most formulations, the quantity of money demanded depends negatively on a short-term interest rate (representing the opportunity cost of holding money) and positively on a transactions variable such as GNP. The actual money stock is then regressed on such variables (and perhaps other variables), and the estimated coefficients of the interest-rate and transactions variables are interpreted as those of the demand function (instead of the supply function or some unidentifiable mixture of supply and demand functions). Theory does not specify the form of the regression equation, nor does it specify which interest-rate or transactions variable is appropriate or which supply variables should be held constant. Therefore, *second*, the investigator has considerable latitude for data mining and specification searches—that is, for trying out alternative specifications of the regression equation until it fits the data satisfactorily in terms of standard statistical tests.[27] "Thus, the existence of considerable specification uncertainty . . . has the effect of increasing the precision and detail of reported conclusions. . . . Obviously the appropriate consequence . . . would be just the opposite: to decrease the scope of the inferences which can with confidence be drawn from the data" (Cooley and LeRoy 1981, pp. 830–31). However, *third*, this practice ties the estimated coefficients more and more closely to whatever peculiarities might exist in the data for a given sample period, and "a marked deterioration in performance should not be surprising when the equation is applied to data other than those used to fit the equation and conduct the specification search" (p. 831). Moreover, *fourth*, the interpretation of the estimates as applying to the demand function is legitimate only if the econometric problems of simultaneity and identifiability can be ruled out, but the discussions of these problems in the existing literature[28] are "extremely perfunctory and superficial, [and] amount to dismissing the problem without serious analysis" (p. 828). Cooley and LeRoy provide a serious analysis of the problems but find themselves unable to overcome them: "After considering and rejecting several plausible possibilities, we conclude that we are unable to devise a statistical procedure that will identify a demand relation" (p. 828).

In short, we don't know what set of liquid assets has the most stable demand function.[29]

25. See Wood (1981*b*) for an interesting discussion of these issues.

26. Some economists dispute this. See Hafer and Hein (1982) and Hamburger (1977).

27. Cooley and LeRoy observe (1981, p. 830, n. 5) that the publication of one major money-demand study was preceded by the estimation of more than 500 regression equations.

28. See Walters (1967) and Starleaf (1970) for exceptions.

29. Although most of the searches for a stable demand function focus on sets of assets more inclusive than the medium of exchange, this is not the only possible approach. Lothian (1976) gets "good results" with the monetary base.

6. What has all this to do with the definition of money? The short answer is, nothing. It has everything to do with the *demand* for money but nothing to do with its quantity. The existence of close substitutes for money clearly affects its demand. An increase in the number or types of such substitutes will reduce the quantity of money demanded at given values of its other determinants. This effect need not, however, be one-for-one, so that the excess demand will be different if we call the substitutes "money." That is, we have to get the definition of money right *before* we can test the stability of its demand.

Monetarists err in three ways when they treat their belief in a stable money demand as an axiom. First, they lose credibility with nonmonetarists, who know very well that the stability is an empirical, not an axiomatic, proposition. (Its *negative* is virtually axiomatic among some Keynesians, but perhaps only among them.) Second, they stimulate much useless controversy over the proper definition of money. Third, and most important, they forfeit the opportunity to test, refine, and demonstrate the value of their views.

7. Three approaches rooted in monetary theory

A monetary theory is a set of assumptions, intermediate propositions, and conclusions about the relations between money and other economic phenomena. Its purpose is to explain variations in the quantity of money and the effects of those variations on prices, incomes, output, and employment. It may be presented in a highly abstract form that disregards many institutional details of actual monetary systems. In a very abstract form it offers no empirical identification of money. Frequently it even eschews an explicit *definition* of money. In such a case it nevertheless conveys a definition implicitly: money is that which behaves as the theory says it does and affects things in the manner claimed. Money is then a theoretical construct, and to search for its empirical counterpart is to test the theory. (If nothing in the world matches the theoretical money very closely, the theory is wrong.)

The chief danger of this approach is a tendency to relax the demands on the empirical counterpart—to accept the thing that behaves "most like" the theoretical construct instead of holding out for a more exact match. As there is bound to be something in the world that is in some sense "closest" to the construct, its acceptance would convert the theory into a tautology. The theory says that money does *a, b, c,* . . . . If we then define money as that which comes closest to doing *a, b, c,* . . . , we have accepted the theory as true (or true enough for our purposes) and forgone all opportunities to test it.

But this development is not inevitable, and there is nothing intrinsically wrong with the approach. Indeed, the economics profession is in such substantial agreement about the central core of monetary theory that it would almost certainly reject a money definition that led to serious conflicts with the theory. This is seen very clearly in statements by Friedman, Tobin, and Yeager. These economists, three of the leading students of money during recent decades, differ so greatly in their methodological, empirical, or policy views that they almost constitute a "basis" for the expression of all views related to money that command professional respect.[30] Yet consider the substantial agreement shown in the following passages.

> *Milton Friedman*: The quantity theory of money takes for granted that what ultimately matters to holders of money is the real quantity rather than the nominal quantity they hold and that there is a fairly definite real quantity of money that people wish to hold under any given circumstances. Suppose that the nominal quantity that people hold at a particular moment of time happens to correspond at current prices to a real quantity larger than the quantity that they wish to hold. Individuals will then seek to dispose of what they regard as their excess money balances; they will try to pay out a larger sum for the purchase of securities, goods and services, for the repayment of debts, and as gifts than they are receiving from the corresponding sources. However, they cannot as a group succeed. One man's expenditures are another's receipts. One man can reduce his nominal money balances only by persuading someone else to increase his. The community as a

30. Tobin opposes Friedman's monetary policy as well as his definition of money. Yeager agrees with the former (more or less) but opposes the latter. It should be noted, too, that Yeager is writing in opposition to Tobin's views of money as expressed in Tobin (1963) and Tobin and Brainard (1963). For further discussion of the latter, see Wood (1981*a*).

whole cannot in general spend more than it receives.

The attempt to do so will nonetheless have important effects. If prices and income are free to change, the attempt to spend more will raise the volume of expenditures and receipts, expressed in nominal units, which will lead to a bidding up of prices and perhaps also to an increase in output. . . .

The initial excess of nominal balances will therefore tend to be eliminated, even though there is no change in the nominal quantity of money, by either a reduction in the real quantity available to hold through price rises or an increase in the real quantity desired through output increases. And conversely for an initial deficiency of nominal balances. (1971, pp. 2-3)

James Tobin: [T]he nominal supply of money is something to which the economy must adapt, not a variable which adapts itself to the economy—unless the policy authorities want it to. Furthermore the private sector must be induced to hold the . . . supply, not by adjustments in its own nominal yield as would occur with other assets . . . with market-determined yields, but by changes elsewhere in the economy. Adjustments to make the public content to hold an enlarged supply . . . involve some combination of reductions in nominal interest rates on other assets, increases in real incomes, increases in commodity prices, and possibly downward (!) revisions of inflation expectations. Models of the impact of money on the economy, wherever they are located in the monetarist-Keynesian spectrum, all share these characteristics of "money" and their implications. (1980, p. 319)

Leland Yeager: An initial excess supply of money touches off a *process* that raises the nominal quantity demanded quite in accordance with the demand function for money holdings as the nominal money values of wealth and income and transactions rise. In the face of an initially deficient money supply, conversely, deflation of prices and real economic activity reduces the nominal quantity demanded. Demand and supply interact, then, not to determine the nominal quantity of money—that is determined on the supply side—but to determine the nominal flow of spending and the purchasing power of the money unit.

> This process that reconciles the demand for money with the supply is the theme of what J. M. Keynes [in *The General Theory*] called "the fundamental proposition of monetary theory" and Milton Friedman called "the most important proposition in monetary theory." Briefly, everyone can individually hold as much or as little money as he effectively demands, even though the total of all holdings may be exogenously set; for the total flow of spending adjusts in such a way that the demand for nominal money becomes equal to the exogenous supply. (1978, p. 6)

Friedman, Tobin, and Yeager also agree that money should be defined in a way that makes sense of the central core of monetary theory. Tobin is quite explicit about this. The passage quoted above appears in his comments on the Federal Reserve Board's staff proposals for redefining money (see Board of Governors of the Federal Reserve System 1979). After noting the conceptual criteria advanced by the Board's staff, Tobin observes that "none of the criteria really capture distinctive features of 'money' as they typically appear in macroeconomic and monetary theory" (1980, pp. 318-19). A bit later on, he expresses his surprise that "none of the existing or proposed monetary aggregates approximates the theoretical concept" (p. 320). Friedman is nearly as explicit. Friedman and Schwartz say of the problem of definition that "no issue of principle is involved, and no single definition need be 'best.' The problem is . . . to choose an empirical counterpart to an abstract concept. For us the test is strictly pragmatic: which counterpart is most useful in making predictions about observable phenomena on the basis of the theory one accepts" (1970, p. 1).[31] The question, in other words, is which empirical counterpart most closely corresponds to the "money" in monetary theory.

Yeager's adoption of the approach is not explicit, but it is surely implicit in the following passage:

> Generally speaking, markets can react in four alternative ways to excess demand for or supply of

31. Though unable to find an "issue of principle" in the problem of definition, Friedman and Schwartz devote 109 pages to criticisms of competing definitions and defenses of their own. The discussion is interesting but marred in many places by illicit conversions (for example, pp. 107-8).

something. (1) Excess demand raises and excess supply reduces the thing's price and so too the money value of its total stock. This process can restore equilibrium even if its physical amount, as of Old Masters, cannot adjust. (2) The amount supplied responds to excess or deficiency of demand, as with automobiles, government savings bonds, and deposits in several types of [nonbank financial intermediaries]. (3) A frustrated excess demand for something is diverted onto other things. If those other things are ordinary goods and services, rather than money itself, the economic system responds in operationally much the same way as if demands had run in the first place in favor of the goods and services that people wind up buying. (4) Excess demand for a particular thing may reveal itself as an excess supply of other things in general; and if their prices are not sufficiently flexible downwards, a general excess supply of them would bring curtailment of their outputs and so of real income.

With money, quite distinctively, an excess demand brings the fourth type of response. This happens because its supply and demand do not directly confront each other on a particular market. No actual "money market" exists on which price or quantity adjusts or from which frustrated demanders turn away and move to other markets. The medium of exchange has neither its own specific market nor a specific price of its own that could adjust to correct excess demand or supply. . . .

For these reasons, an excess demand for money causes more pervasive economic disruption than excess demand for anything else, even the nearest of near-moneys. Because money is the one thing routinely exchanged against all sorts of things, an excess demand for it does not appear on any particular market or in connection with any particular disequilibrium price. People meet frustration trying to sell their labor or other goods and services but perceive no difficulty attached to money itself. An economy-wide excess demand for money shows up not as specific frustration in buying money but as dispersed, generalized frustration in earning incomes. . . .

No other excess demand could be so pervasively disruptive. The contrast between money and anything else, ranging from Old Masters to the nearest of near-moneys—even Treasury bills and savings-and-loan deposits—is instructive. Because nonmoney does not have a routine flow to be interrupted or shrunken in the first place, efforts to hold more of it than exists cannot cause such pervasive trouble. Excess demand for a nonmoney hits its own market specifically. The frustrated demand either is removed by a rise in the thing's price (or fall in its yield) or increase in its quantity or else is diverted onto other things. No excess demand for a nonmoney can persist, unaccompanied by an excess demand for money, and yet show up as deficiency of demand for other things in general. For the medium of exchange in contrast, excess demand is neither removed directly nor diverted. Not even the nearest of near-moneys shares with money the simple but momentous characteristic of routine exchange and circulation. (1978, pp. 8–10)

Why does Yeager insist so strongly on the distinction between money and near moneys? Because only money (that is, the medium of exchange) has the properties claimed for it by monetary theory.

Though Friedman, Tobin, and Yeager agree both about the main theoretical effects of monetary changes and about the need to define money in a way that is consistent with those effects, they disagree about the identification of money. Yeager, as we have seen, identifies money with the medium of exchange. (See also Yeager 1968.) Friedman settles on currency plus total bank deposits held by the public (see Friedman and Schwartz 1970, pt. 1, and Friedman and Meiselman 1963). Tobin favors the monetary base: "If there is a quantity that is the monetary anchor of the economy, this is it" (1980, p. 320).

Thus three leading economists begin at essentially the same point but reach markedly different conclusions. They agree about the principal effects of monetary disturbances but attribute those effects to different characteristics of money: its routine circulation as the exchange medium (Yeager), its ability to serve as a "temporary abode of purchasing power" (Friedman), or its exogenous quantity and yield (Tobin). It is these attributions that lead to the different identifications. All are problematical.

7.1. Emphasis on the routine circulation of exchange media

Yeager clearly regards monetary theory as the

theory of exchange media and attributes the "momentous consequences" of excess demand for or supply of money to its routine circulation in all markets. "Despite an overall excess demand, anyone can satisfy his demand for money balances by simply retaining part of his income in the form in which he *routinely* receives it" (1978, p. 9; emphasis supplied).

For a thing to be money, therefore, it must satisfy two conditions: it must be a medium of exchange, and it must circulate routinely. Both conditions are necessary. Things that satisfy one condition but not the other are not money. In particular, nonbank travelers' checks are not money because, although they meet the first condition, they do not circulate. "Things would be different if the custom developed of endorsing traveler's checks in blank and circulating them indefinitely—if each payee accepted them with the intention of passing them along to others and without anyone's asking the issuer to redeem them" (Yeager 1968, p. 57).

What about money market mutual funds? To their holders, these funds are virtually identical to checking accounts: one can pay bills with them simply by writing checks, the only difference being that the checks must exceed some minimum amount (typically $500). Yeager does not attempt to classify these funds; indeed, he suggests (1978, p. 1) that they may be blurring the distinction between money and other assets. Their classification can be determined, however, by noticing that they do not circulate.

When a $500 check written on shares in a Money Market Mutual Fund arrives at the Fund's bank for payment, the bank, on prior authorization of the Fund's operator, debits the operator's demand account for $500, transfers this amount into a zero-balance demand account maintained for the shareholder, debits the latter account, and credits the demand account of the payee (or the payee's bank or that bank's correspondent bank). These bookkeeping entries are made for the purpose of control and security; their net effect is as if the shareholder simply wrote a check on the Fund operator's demand account. The shareholder has not paid with his Fund shares but with the operator's demand-account balance. The operator must then replenish his balance by selling $500 worth of the Fund's assets in the money market. (He also debits the shareholder's account.) The $500 worth of Fund shares, far from circulating from payer to payee, go out of existence. They are *converted* to a demand-account balance. It is all the same to the shareholder, who might well regard his shares as money. Properly speaking, however, on Yeager's definition they are not money but assets that are quickly and cheaply (but not without cost[32]) converted into money. They probably affect the shareholder's demand for money but not dollar for dollar.

Still, though the definition implicit in Yeager's discussion unambiguously places nonbank travelers' checks and money market mutual funds outside the category of money, it does not entail a unique identification of money. Today we have three distinct exchange media that routinely circulate: currency, transaction deposits of the public at financial institutions, and the reserve deposits of these institutions at the central bank. The sum of currency and transaction deposits (essentially equal to M1) is the most common identification of money. But the sum of currency and reserve deposits (the monetary base), or even the sum of all three media, qualifies just as well. To choose between these alternative identifications we have to appeal to some additional property of money. The properties of being a medium of exchange and routinely circulating are not collectively sufficient.

7.2. Emphasis on the temporary abode of purchasing power

In his monetary theory, Friedman favors what he calls the "cash balances" version of the Quantity Theory, which, by "stressing the function of money as a temporary abode of purchasing power, . . . makes it seem entirely appropriate to include also such stores of value as . . . time deposits not transferable by check" (1971, p. 9). While not denying the importance of the medium-of-exchange function, Friedman does not emphasize that function as much as the store-of-value function. To Friedman, money is preeminently a temporary abode of purchasing power.

> The essential feature of a money economy is that

32. The cost of the conversion is *paid* by the Fund operator in the form of service charges levied by the bank and transaction costs in the money market. It is *borne* by the shareholder in the form of a reduced yield on his shares.

it enables the act of purchase to be separated from the act of sale. . . .

In order for the act of purchase to be separated from the act of sale, there must be something which everybody will accept in exchange as "general purchasing power". . . . But also there must be something which can serve as a temporary abode of purchasing power in the interim between sale and purchase. (1971, pp. 8-9)

This emphasis, though *consistent with*, does not *imply* Friedman's choice of M2, for bank time deposits are not the only assets (besides the medium of exchange) that serve as "temporary abodes." The choice of M2 rather than a broader class of assets is explained at length in Friedman and Schwartz (1970, pp. 171-96) and Friedman and Meiselman (1963, pp. 180-85). Friedman and Schwartz view M2 as a more homogeneous total for 1867-1968 (the period for which they were trying to provide estimates of the U.S. money stock), and Friedman and Meiselman found M2 to be more highly correlated with nominal income.

Friedman's emphasis on the store-of-value function is far from compelling. This emphasis treats two distinct propositions as if they were equivalent. One proposition is

A. *If x is money, then x serves as a temporary store of wealth.*

The other is the converse of Proposition A:

B. *If x serves as a temporary store of wealth, then x is (or at least should be treated as) money.*

Proposition A is necessarily true when money is defined as the medium of exchange (for not all purchases and sales can be simultaneous), but it clearly does not imply Proposition B.

7.3. Emphasis on exogeneity

Tobin's view of the distinctive properties of money is quite different from the views of Friedman and Yeager. He writes:

> The distinctive features of "money" . . . are (1) that it is an "outside" asset, not generated by the private economy itself as the counterpart of private debt, and (2) that its nominal or own rate of interest is institutionally or legally fixed and is not determined in markets. . . . [The story told by monetary theory] would be quite different if "money" were an inside asset, its nominal quantity and yield endogenous, or if people were induced to hold additional outside "money" by an increase in a market-clearing nominal interest rate on money itself. (1980, p. 319)

When Tobin says that the effect of excess supply or demand for money "would be quite different" if the nominal quantity and yield of money were endogenous, he is evidently suggesting that they would be *qualitatively* different—even, perhaps, no more significant than the effects of an excess demand for an ordinary good. This is extremely doubtful. The effects would clearly be *quantitatively* different, for with endogenous quantity and yield, money could take up some of the adjustment itself, leaving a smaller adjustment for the rest of the economy. But while the economy-wide adjustment would be smaller—Yeager's "momentous consequences" would have a smaller magnitude—the adjustment would still necessarily be *pervasive*. The consequences so instructively explained by Yeager do not depend (except in magnitude) on exogeneity of money. It is money's routine circulation as the exchange medium that transmits its excess demand or supply, inversely, throughout the economy. The economy-wide consequences of, say, a 10-percent excess demand for an endogenous exchange medium might be equivalent to those of a 5-percent excess demand for an exogenous medium. That is all.

8. Conclusions

We have explored ten approaches to the definition of money. Six of these ten have nothing to recommend them. The approach that emphasizes tangible media of exchange (section 2) depends on a distinction without a difference. The approaches that emphasize "liquidity" (section 3) or "means of payment" in an unqualified manner (section 4.1) rest on the fallacy of composition. The approaches that emphasize correlation with GNP (section 5) or the "temporary abode of purchasing power" (section 7.2) rest on the fallacy of illicit conversion. The approach emphasizing stability of the demand function (section 6) rests on this fallacy and confounds supply and demand. Though none of the six can tell us what money is, all except the first and second help us to see why money matters; and even the

first and second are helpful in understanding the financial system.

A seventh approach, emphasizing exogeneity (section 7.3), has little to recommend it. Exogenous and endogenous exchange media indeed behave differently in monetary disturbances, but their general effects on the economy differ in degree, not in kind.

The three promising approaches emphasize the means of simultaneous payments (section 4.2), the means of payment that can be used without incurring debt (section 4.3), and the routine circulation of the medium of exchange (section 7.1). All three, though incomplete, seem to capture salient properties of money. Are they independent, or does one or more of them follow from the other(s)? Do they collectively provide a satisfactory definition? These questions remain to be addressed, together with institutional details and regulatory practices that must be understood, before we can answer the question, What is money today?

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The *Economic Review* is published by the Federal Reserve Bank of Dallas and will be issued six times in 1984 (January, March, May, July, September, and November). This publication is sent to the mailing list without charge, and additional copies of most issues are available from the Publications Department, Federal Reserve Bank of Dallas, Station K, Dallas, Texas 75222. Articles may be reprinted on the condition that the source is credited.