

The Government and the Monetary Unit

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December, 1981

This paper is part of the NBER's Inflation Project in its Research Program on Economic Fluctuations. All opinions are mine alone. I am grateful to John Bilson, Stanley Fischer, Milton Friedman, Karen Johnson, Ronald McKinnon, Alexander Rawls, and Thomas Sargent for helpful discussions.

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Most economists think of the government's role with respect to the monetary unit in the following way: The government creates a unique instrument denominated in the official monetary unit. Then it intervenes in the money market so as to set the purchasing power of the monetary unit at the desired level or to accomplish some other goal. A relatively large supply of government money will raise the price level, and vice versa. The creation of the instrument and the government's purchases and sale of instruments are intrinsic to the system, according to this conventional line of thought.

My point in this brief paper is that creation of a government instrument and intervention to support its value are only one way for the government to establish a monetary unit. Another way, in wide use in the nineteenth century, has the government announce the definition of the monetary unit in terms of real resources. Creation of a government instrument and intervention in its market are unnecessary under a resource definition. Modern analysis of alternative systems, notably the gold standard, has gone off track by reliance on the principle that monetary policy invariably consists of intervention in an asset market.

I will take for granted the desirability of government sponsorship of a monetary unit. An economy functions most smoothly when there is widespread agreement on the system used to quote prices, maintain accounts, and write forward contracts.

A common monetary unit has the same virtues as a uniform system for switching and transmitting telephone calls. No exercise of monopoly power is required to achieve the benefits in either case. Experience in countless nations shows that the simple announcement of the definition of a national monetary unit, without any compulsion for its use, is sufficient to bring about almost unanimous use.

The paper sets up the following way of thinking about the government's role with respect to the monetary unit. The government establishes a definition of the monetary unit in terms of some well-defined resource in the economy. The resource can be a commodity or bundle of commodities, as in the gold standard. It can be the currency of a foreign nation. Or, as in most modern systems, it can be a special asset created by the government for monetary purposes. The definition creates two policy instruments by which the government can control the purchasing power of the monetary unit. First, it can vary the resource content of the unit. For example, under the gold standard, the number of grains of gold in the dollar can be adjusted to stabilize the purchasing power of the dollar. Second, the government can intervene in the resource market to influence the cost of living stated in terms of the resource.

Within this schema fit various historical, existing, and proposed monetary systems. Under the U.S. gold standard as it existed from the adoption of the Constitution until the Civil War, the dollar was simply defined as a fraction of an ounce of gold. The definition was changed slightly on one occasion, but

otherwise no attempt was made to influence the dollar cost of living by modifications in the gold content of the dollar. No intervention in the gold market occurred at all; the Federal Government held no stock of gold.

Current U.S. monetary arrangements rest on the definition of the dollar in terms of instruments of the Federal Reserve, high-powered money. The monetary unit called the dollar is just one dollar of high-powered money. The idea of adjusting the number of high-powered dollars in the U.S. dollar is completely alien to the system, and we do not even have a good vocabulary for describing such an action. The purchasing power of the dollar is controlled entirely by intervention in the resource market, that is, by open-market operations. But both the resurgence of free banking thought among economists and important movements toward financial and monetary deregulation have called attention to alternative monetary systems. This paper attempts to say something about the fundamental principles of the relation between the government and money.

Currency

The economic problems of currency dominate economists' thinking on monetary issues in a curious way. Many authors use the word "currency" to mean "monetary unit," but this invites confusion. Currency should mean a small-denomination instrument in bearer form. Of course, it is possible to define the monetary unit as one unit of a resource called currency¹, but this is only one of many different definitions. When the definition of the monetary unit involves a commodity or a special paper liability of the government, it should not even be taken for granted that currency has to be denominated in fixed monetary units. In the U.S. and virtually every other country, regulations prohibiting bearer instruments in small denominations are so strong that we have no practical experience with alternatives to conventional paper money.

Under some definitions of the monetary unit, including commodity definitions, the government need not concern itself with the volume of currency or other private financial instruments. From the perspective of stabilizing the price level, there is no important difference between a promise to deliver commodities on demand and a promise to deliver at a specified future date. Either one could pass from hand to hand as a convenient way to convey purchasing power. The most

1. Eugene Fama (1980) has suggested the benefits of such a system.

important characteristic for circulation of an instrument as currency is availability in small denominations. Governments today almost universally prohibit private instruments in small denominations; the only important exception is travelers' checks, which may not bear interest.

As a logical matter, instruments with a face value in monetary units cannot bear interest. Interest-bearing currency therefore cannot be in face-value form. It is an unanswered question whether interest-bearing currency would compete effectively with conventional currency were it permitted by regulation. Jastram (1981, p. 39) reports that several types of interest-bearing currency flourished in Britain in the early eighteenth century, including promissory notes from banks in bearer form, a special form of public debt called the malt ticket, and government lottery tickets. But all interest-bearing currencies have the disadvantage that their current value in monetary units must be looked up in a table and cannot be printed on the instrument. As a result, face-value currency is likely to survive even when deregulation permits private instruments in any form.

The history of the definition of the U.S. dollar

In the eighteenth and early nineteenth centuries, the establishment of the monetary unit was regarded as exactly the same exercise of government power as the establishment of uniform standards of weights and measures. Nowhere is this clearer than in the Constitution of the United States, where article I, section 8(2) lists among the powers granted to Congress:

To coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures.

Acting under this power, Congress, in 1792, created a new monetary unit called the dollar, defined in terms of weights of gold or silver.² Though the unit was inspired by the existing Spanish dollar, the definition was deliberately made slightly different as a gesture of nationalism. Congress also established a national mint, but its purpose was to produce coins from bullion brought in by the public. The mint did not create a separate government financial instrument and did not intervene in money markets. The function of the mint was to certify the metal content of coins, just as the Department of Agriculture certifies the quality of meat today. Government

2. For a detailed account of early U.S. monetary law, see James Hurst (1973).

paper currency did not come into being until the Civil War.

Congress clearly viewed the definition of the dollar as exactly parallel to its definition of the yard and the gallon. No legislation required anyone to use the dollar. The effect of the definition was to clarify what action discharged an obligation to pay dollars. Had Congress not acted to define the U.S. dollar, private contracts would have had to specify payments in terms of commodities or foreign monetary units. The near-universal adoption of the dollar as the convenient way to quote prices and contract for future payment shows the usefulness of a government definition of a monetary unit.

The early nineteenth century saw the rapid development of a financial system based on the U.S. dollar as defined in the legislation of 1792. Banks created demand instruments--currency at first, but deposits in later decades--which promised redemption in gold or silver. The period has become notorious for a phenomenon common to all financial markets: instruments issued by institutions with doubtful ability to repay tend to trade at a corresponding discount. Further, occasional runs on banks occurred as the public questioned the ability of the banking system as a whole to make good on its promises. In any case, the existence of instruments trading at a discount was no failure of the definition of the dollar. A piece of paper promising to pay a dollar on demand was not itself a dollar. The dollar was unambiguously .04838 of an ounce of gold or the equivalent amount of silver. The lesson to be learned from the early nineteenth century is the success of the

government in establishing a monetary unit purely by definition, not that the financial system of that era was a success.

The Civil War saw a discontinuous shift to a fiduciary definition of the dollar. The dollar was redefined as a certificate issued by the federal government, the greenback. Rapid expansion of the greenback issue depressed the purchasing power of the dollar by nearly a factor of three. The Civil War and its aftermath gave rise to the only important failure in U.S. history of the national consensus on the definition of the dollar. In California and Oregon, the dollar continued to mean the traditional gold dollar.³ Greenbacks traded at a discount. In the rest of the country, the dollar meant the greenback and gold dollars traded at a premium.

The resumption of the gold definition of the dollar in 1879 was far from a restoration of the simple monetary system of the early nineteenth century. The federal government retained a monopoly position in currency, though it was effectively committed to keeping the value of the currency on par with gold. The central problem of the financial system of the era became apparent in the financial panics of 1893 and 1907, when upsurges in the public's demand for gold brought temporary suspensions of the gold definition of the dollar.

The creation of the Federal Reserve System in 1914 with its unlimited power to create legal tender dollars marked the effective end of the gold definition of the U.S. dollar. Though the government remained committed to a fixed dollar price of

3. See Mitchell (1903), p. 144.

gold, it could achieve the gold peg through intervention in the gold market independent of any act affecting the purchasing power of the dollar. By limiting the right to own gold and by sales from the gold stockpile, the government was able to maintain the price of gold at low levels in spite of significant increases in the prices of most other goods and services. The gold peg was maintained until March 1968. The last vestige of the gold definition of the dollar disappeared in 1971 when the United States discontinued sales of gold to central banks. For the past decade, the U.S. has operated a purely fiduciary monetary system.

Under the current monetary system, the dollar is defined as a particular instrument of the Federal Reserve. These instruments have positive market value even though they pay no interest, because their legal tender status creates a demand for them as reserves. The demand is enhanced by legal reserve requirements and by the prohibition of private financial instruments in small denomination bearer form. Monetary policy has concentrated exclusively on regulating the quantity of the instruments and has not even remotely considered the possibility of varying the number of instruments constituting a dollar.

Variations in the resource content of the monetary unit

A government establishes a monetary unit by announcing that the unit is a certain amount of some resource. When it also controls the total supply of the resource, policy tends to concentrate on that supply. But every monetary system has another degree of freedom which is at least potentially a policy instrument, namely the resource content of the monetary unit.

Under the British silver standard, the silver content of the pound sterling was changed aggressively by the Crown, generally downward in an effort to raise government revenue (for a complete history, see Jastram (1981)). The pound sterling was established by William the Conqueror as an actual pound of silver. By the early sixteenth century, the silver content of the pound sterling had fallen to just under half a pound. Henry VIII made successive large decreases in the silver definition of the pound so that it fell to about a quarter of a pound by 1552. Today the pound sterling buys about 0.015 pounds of silver.

By contrast, during the period when the U.S. dollar was defined in terms of gold, from 1792 to 1914, with an interruption during the Civil War, no important change in the gold content of the dollar occurred.

Though historical changes in the metal content of monetary units tended to cause depreciations in the purchasing power of the units, the process could just as well operate in reverse--the content of the unit could be increased to offset a

decline in the purchasing power of the resource. The instability of the purchasing power of gold, and hence of the price level under a gold standard, led Irving Fisher (1920) to propose systematic adjustment of the gold content of the dollar to offset movements in the purchasing power of gold. In effect, Fisher wanted the government to define the dollar as enough gold to buy the cost of living bundle. With Fisher's policy, the government would announce a new definition of the dollar each month, just after measuring the dollar cost of living. If the index were, say, 101 instead of the target of 100, the gold content of the dollar would increase by one percent. The cost of living would be held close to 100 through this principle of negative feedback, just as a thermostat keeps a room at the desired temperature despite wide variations in the outside temperature.

Fisher's idea applies to any monetary system. Whatever resource participates in the definition of the monetary unit, the unit can be defined as enough resource units to buy the cost of living bundle. The generalization to other commodity standards is obvious. But even a fiduciary system admits the Fisher technique. Let the Federal Reserve call its legal tender instruments "reserve certificates" instead of "dollars," and let the reserve certificate be the only legal tender. Then define the dollar as enough reserve certificates to buy the cost of living bundle.

Under Fisher's plan, many redefinitions would be partly or fully anticipated in financial markets and so would be offset by

corresponding changes in the returns to dollar-denominated assets. For example, suppose that the government's formula called for a one percent increase in the dollar value of the resource unit because the cost of living was one percent too low. The definition of the dollar would change discontinuously at midnight on Saturday. Anyone who could borrow at a reasonable annual interest rate could make a large arbitrage profit by buying the resource unit at the old price on Friday and selling at the new price on Monday. Interest rates on weekend loans would rise to just over 365 percent per year to eliminate the arbitrage opportunity. In stock and bond markets, fully anticipated jumps of one percent would occur over the weekend. The value of the dollar relative to foreign monetary units would jump by one percent, and so on. In the case of savings instruments held by the public, intermediaries would offer a choice, just as they do now. They could offer accounts with interest rates fixed in advance, or money-market funds where interest payments depend on the earnings and changes in value of the portfolio.

Face-value instruments like checking accounts and currency create a minor problem when markets anticipate important changes in the resource content of the monetary unit. Funds will move into the instruments whenever an increase in the resource content is expected and will move out whenever a decrease is expected. Precisely the same problem arises today in countries with crawling-peg policies for exchange rates. The solution is to make the revaluations sufficiently frequent so that

anticipated changes are never nearly as large as transactions costs.

Systematic exploitation of the power to redefine the resource content of the monetary unit is one of the possible routes to stability of the price level, though I am unaware of any practical application of the idea to the principal monetary unit of any nation.⁴ Any general discussion of alternative monetary systems needs to keep in mind the availability of systematic redefinition.

4. Crawling pegs for exchange rates apply the idea in reverse by validating declines in the purchasing power of the domestic monetary unit.

Proposals for new monetary units

Metallic definitions of monetary units were the rule until the twentieth century, when fiduciary standards supplanted them. But other exercises of the definitional power are in use today or have been proposed.

(i) Definitions in terms of foreign currencies

One attractive technique for a small country is to define a monetary unit as varying quantities of the currency of another country. The following very simple case illustrates the basic idea. Consider a country whose economy is completely dominated by a surrounding larger country. The small country is purely a price-taker in all markets. But the small country is dissatisfied with the instability of the purchasing power of the large country's monetary unit. It decides to create its own monetary unit with stable purchasing power, and so adopts a law with the following provisions: The monetary unit is defined as x units of the large country's currency, where x is the most recently available index of the cost of living in the large country. When a merchant quotes a price in local units or when a contract specifies future payments in local units, the courts are to interpret the units as x units of the large country's currency.

The effect of the law is to create a local monetary unit with

stable real value. Financial intermediaries can carry out transaction services in the government-defined unit, or in any other unit they choose. However, if they use the name of the government unit, the law requires they adhere to the government definition, crediting accounts with one unit whenever x units of the large country's currency are presented, and paying x units on demand. The value of the local unit can never depart from the government's definition, because if it did, the rights to present or collect legal tender would give unbounded arbitrage profits to customers and losses to intermediaries. There is no need to create any local government money--defining the local monetary unit in terms of the large country's currency does the job perfectly. This example illustrates two major points of the paper: The only government action necessary to stabilize the monetary unit is the announcement of the definition of the unit; the creation of a standard of value is quite independent of creation or regulation of a medium of exchange.

I am not aware of any practical application of the power to create a local monetary unit as enough of a foreign currency to buy the cost of living bundle. Numerous instances of local units which are defined as fixed multiples of foreign units can be cited. In Haiti, the monetary unit is simply defined as twenty U.S. cents. In Hong Kong before 1972, there was no central bank to issue fiat money and control its quantity. Instead, an Exchange Fund issued certificates of indebtedness without limit at a fixed price in pounds sterling. These certificates functioned as legal tender and established the

definition of the Hong Kong dollar in fixed relation to the pound sterling. Unfortunately, the unstable purchasing power of sterling led the government to an unwise series of modifications in its monetary system rather than the adoption of the simple technique of raising the sterling definition of the Hong Kong dollar as necessary to offset British inflation.⁵

Creation of an extra-national monetary unit of constant purchasing power has been advocated in Europe by a group of economists (Fратиanni and Peeters (1978)). The new unit would be defined as variable numbers of units of the various European currencies. Unfortunately, the proponents of this idea fail to separate the definition of the monetary unit from the creation of a medium of exchange. They propose a cumbersome international apparatus for creating accounts denominated in the new unit, a function that could better be handled by existing private intermediaries. The benefits of a new international unit as an addition to, not a replacement for, existing national units are dubious in any case. Businesses are already equipped to write forward contracts in purchasing power terms. The public would need an education just as extensive as that needed to convince them of the value of indexed contracts to gain their acceptance of contracts in an unfamiliar international unit. Far better would be the stabilization of the purchasing power of

5. A perceptive description of Hong Kong's recent floundering and a clear statement of the need to return to the old system or to create a conventional central bank appears in the *Asian Monetary Monitor*, July-August 1981.

each of the national monetary units. There is no historical basis for the group's naive belief that a stable international monetary unit will automatically displace unstable national units. There is, after all, a highly stable European monetary unit already, the Swiss Franc, which could serve this purpose.

(ii) The tabular standard

Proposals for an accounting unit with constant purchasing power, to be used in parallel with a monetary unit, date back to Stanley Jevons' (1907 ed.) and Alfred Marshall's (1887) tabular standard. Jevons and Marshall recognized that government sponsorship of an accounting unit did not require the creation of any instrument denominated in that unit. They also recognized that the principal benefit from a unit with constant purchasing power would come from its use in forward contracts, where elimination of the risks of inflation would help both parties. In effect, they proposed to make it easy to write indexed contracts. At the time, government cost of living indexes were not available; much of their discussion deals with the problems of the construction of a reliable index. Although many economists today have the contrary impression, nothing in the tabular standard dealt with the creation of a monetary unit or instrument with constant purchasing power. Jevons' and Marshall's discussions presuppose the continuation of the gold definition of the monetary unit used for currency and spot

transactions.

Economists since Jevons and Marshall have been puzzled at the limited use of indexed contracts in conditions of unstable purchasing power of the monetary unit. Extreme inflation seems to drive people away from forward contracts, rather than making them set up indexed contracts. An important exception has occurred recently in Chile, where the tabular standard is now widely used in forward contracting.⁶ Every month, the government publishes the peso value of a unit called the Unidad de Fomento, or UF. For the forthcoming month, its peso value rises daily at the most recently observed rate of increase of the cost of living in pesos. For months beyond, its peso value will be determined in the same way from future changes in the cost of living. In brief, the UF is defined as enough pesos to buy the cost of living bundle. Since its introduction, the UF has become the standard way to quote apartment rentals, mortgage payments, and a number of other types of forward contracts. In other cases, like passbook savings accounts, some institutions quote terms in UFs and others in pesos. The government-sponsored, privately administered retirement system does its accounting in UFs and offers annuities in UFs. Prices for immediate delivery are never quoted in UFs, and there is no currency denominated in UFs. The UF is a tabular standard, not

6. What follows is based on the eyewitness accounts of Phillip Brock and examination of advertisements and announcements in *Estrategia* (March 24 to 30, 1981), a financial newspaper published in Santiago.

a true monetary unit. It would disappear from use under a successful stabilization of the purchasing power of the Chilean peso.

It is an interesting commentary upon the role of the government in the financial system that the UF has flourished in the one country where the government has introduced it, even though almost every country publishes a cost of living index which is effectively a UF. Experience in both the U.S. and Chile suggests the importance of government initiative in establishing either a monetary standard or a tabular standard.

(iii) Commodity standards

Proposals to create monetary units defined in terms of a bundle of commodities have been put forward by economists with great regularity since the nineteenth century.⁷ My own investigation suggests that a simple four-commodity definition of the dollar over the postwar period would have brought a considerable improvement over the actual behavior of the price level, and that the performance would be even better with Irving Fisher's system of defining the dollar as enough of the four commodities to purchase the cost of living bundle (Hall (1985)).

Discussions of commodity standards often fail to make a clear distinction between the definitional role of the government and

7. See Milton Friedman (1951) for an extensive discussion and bibliography.

its intervention in commodity markets. As the U.S. system in the early nineteenth century demonstrated, the government's role can be purely definitional. It can simply announce that the monetary unit is so many ounces of each of a group of commodities and leave it to the private economy to provide the necessary financial instruments denominated in the unit. No government reserves or government currency are intrinsic to a commodity standard. Authors who speak of "commodity-reserve currency" are inappropriately limiting the discussion in two respects: holding reserves is not a necessary government function, nor is issuing currency.

Though government commodity reserves are not a necessary part of a commodity standard, a commodity definition of the monetary unit creates a private demand for the commodity as a reserve. Again, early nineteenth century American history is instructive. Banks held reserves of gold coins so as to stand ready to redeem their deposits and notes upon demand. In principle, the gold standard made every dollar liability throughout the economy a gold liability, but in practice other participants relied on banks to hold the necessary reserves. Were a creditor to demand payment in gold, a debtor would turn to a bank to supply the gold. But the overwhelming majority of debts were settled with checks and bank notes. The right to demand payment in gold simply ensured the value of the instrument conveyed by the debtor--the creditor would not accept anything of less value than the stated number of gold dollars.

Commodity reserves held because of the commodity definition of

the monetary unit are a social cost of the definition, in comparison to a system with paper reserves. These costs are incurred by private banks when the government stays out of the commodity market, but they are still costs. In this respect, monetary systems based on a paper definition of the monetary unit have an important intrinsic advantage.

(iv) Reserve certificates

Though monetary history has been dominated by definitions of monetary units either as fixed quantities of commodities or as fixed quantities of a paper asset created by the government, a richer set of choices is available. Irving Fisher pointed out the desirability of systematic changes in the gold content of the dollar under the gold standard. In close parallel, systematic changes in the paper asset content of the monetary unit could bring improvements in a system based on a fiat unit. To clarify the exposition of a system embodying this idea, I will suppose that the government creates a paper instrument called a reserve certificate, and that reserve certificates are the only legal tender in the economy. A fixed number of certificates are issued at the outset of the policy; there is no provision for varying the quantity of certificates thereafter.

Reserve certificates have the same economic role under the certificate standard as gold has under the gold standard. Banks hold reserves of certificates in order to redeem their own

instruments and to provide legal tender to their customers. On this account, the certificates have a positive value. Unlike gold, their value is derived entirely from their reserve role and not from commodity demand and supply.

Were the monetary unit defined as one reserve certificate, the system would be essentially the one described by Fama (1980), where a fixed issue of currency determines the price level in an otherwise uncontrolled economy. With a fixed certificate content of the unit and government power to issue new certificates, the system would be close to the prevailing monetary arrangement in most countries today.

The attractive arrangement not previously considered, as far as I know, is to block the government from issuing new certificates and require variations in the certificate content of the unit instead. Just as Fisher wanted to define the dollar as enough gold to buy the cost of living bundle, the certificate system would define the dollar as enough certificates to buy the cost of living bundle. Changes in the certificate content of the monetary unit are not quite isomorphic with changes in the stock of certificates. Both bring the same change in the equilibrium price level, but revaluation of the fixed stock of certificates gives the seigniorage to the owners of the certificates, whereas issuance of new certificates gives the seigniorage to the government. With a fixed stock of certificates, a policy of deliberate inflation through reductions in the certificate content of the monetary unit adds nothing to government revenue.

Conclusions

If the government wants to sponsor a monetary unit, all it has to do is announce the definition of the unit. Such an announcement has the generic form, "The monetary unit is x physical units of resource y ." Experience has shown that such an announcement, unaccompanied by any compulsion, brings almost universal use of the monetary unit for pricing, accounting, and contracting. When the new government of the United States announced that the dollar was .04838 of an ounce of gold, a large and rapidly growing financial system immediately began to organize its activities using the new unit.

The government faces a logically independent choice whether to intervene in the market for the resource underlying the definition of the monetary unit. When the resource is a commodity, intervention is not required, and, indeed, it is hard to see what can be gained from intervention. The first seventy years of the U.S. gold standard, when the government held no gold and issued no currency, stand as a leading example of a purely definitional monetary policy. When the resource in the definition of the monetary unit is a paper liability of the government, intervention is a requirement, but only in the sense of issuing a stock of suitable instruments. This could be done once and for all, and all subsequent monetary policy could take the form of adjustments in the resource content of the monetary unit. Again, there seems no good reason for continuing intervention in the resource market. A once-and-for-all issue

has the distinct advantage of prohibiting the government from using the inflation tax.

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