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4 Explorations in the Gold Standard and Related Policies for Stabilizing the Dollar

Robert E. Hall

4.1 Introduction

Steadily worsening inflation has brought renewed interest in the gold standard as a way to stabilize the purchasing power of the dollar. Only a few economists openly advocate the return to the gold standard; most regard it as a dangerous anachronism. My purpose in this paper is to explore the good and bad features of the gold standard and its generalization, the commodity standard, without taking a stand for or against the idea. A properly managed commodity standard emerges as a potential competitor to a properly managed fiat money system as a way to achieve price stability. Both systems require good management. Simply switching from our existing badly managed fiat money to a badly managed commodity standard might well be a step backward.

The basic findings of the paper are:

1. During the years of the gold standard in the United States (1879–1914), inflation was kept to reasonable levels but cumulated over decades so that the long-run purchasing power of the dollar declined by 40%. The gold standard does not meet the requirement of long-run stabilization of the real value of the dollar. Moreover, recent instability in the world gold market would have brought alternating periods of severe inflation and deflation had the United States been on the gold standard.

2. An acceptable commodity standard could be based on a package of several commodities, chosen so that the historical association of the price

Robert E. Hall is professor in the Department of Economics and Senior Fellow of the Hoover Institution, Stanford University. He also serves as director of the Research Program on Economic Fluctuations and the Project on Inflation of the National Bureau of Economic Research and as chairman of the NBER's Business Cycle Dating Group.

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of the package and the cost of living has been close. An example of such a package contains ammonium nitrate, copper, aluminum, and plywood.

3. Even with the best choice of a commodity standard, it is necessary to redefine the standard periodically. Monthly changes in the commodity content of the dollar should be used according to a fixed rule. Such a rule can promise almost exact long-run stability in the cost of living.

4. Whatever type of commodity standard is adopted, the government should not hold reserves of the commodity. Manipulation of reserves and intervention in commodity markets defeat the anti-inflationary purpose of the commodity standard.

5. Though a good commodity standard would have been far superior to the actual monetary policy of the past two decades, better management of the existing system based on fiat money might have done as well or better. The commodity standard is not inherently superior to fiat money as a way to stabilize the cost of living. The commodity standard is just as subject to abuse as is the existing system.

4.2 The Nature of a Commodity Standard

Under a commodity standard, the government would establish a precise definition of the dollar as a particular quantity of a commodity or quantities of several commodities. For many years in the United States, the dollar was simply 0.04838 of an ounce of gold, for example. As I will argue later in this paper, it is probably better to define the dollar in terms of a resource unit containing a number of commodities rather than in terms of a single commodity like gold. The resource unit itself would be legal tender and would replace dollar bills and the accounting entries currently serving as legal tender in this country. Of course, the physical resources would not actually circulate as currency. Banks and other services would be free to offer accounts denominated in dollars. The Federal Reserve would no longer maintain reserve accounts; reserve requirements and the whole apparatus limiting bank deposits would be abandoned.

The commodity standard stabilizes prices by providing a definition of the dollar in terms of real economic quantities. In this respect it differs sharply from the current system where the dollar is defined as a piece of paper whose value comes only from a scarcity created by the government. Advocates of commodity standards believe that establishment of the standard will prevent the government from continuing the kind of inflation we have had over the past twenty years. However, a commodity standard has within it a policy instrument whose effects on the economy, inflationary and otherwise, are very similar to the effects of the money stock under today's system: The government can redefine the commodity content of the dollar at any time. The dollar price of the resource unit is

closely analogous under a commodity standard to the monetary base under a fiat money system. The government can create inflation under a commodity standard by raising the dollar price of the resource unit just as it has created inflation by raising the number of dollars in the monetary base. Furthermore, there are very good reasons why the government *should* have the power to change the dollar price of the resource unit, just as there are very good reasons for the government to change the monetary base under the current system. There is no substitute for good management in order to achieve satisfactory price stability.

Both a commodity standard and conventional fiat money rest on the legal tender power of the government. Under the power, the government provides the courts with a precise legal definition of what action is required to discharge a dollar debt. In the present system, the currency issued by the Federal Reserve is legal tender. Delivery of currency legally discharges a debt, though in practice most debts are discharged by payment in reserves (through a check on a commercial bank), not currency. The policies of the Federal Reserve keep currency and reserves trading at exact par, except occasionally for small coins, which may sell at a premium. Because legal tender is just an arbitrary paper liability of the Fed, the legal tender definition of the monetary unit makes no promise about the purchasing power of the dollar. People writing contracts involving future payments in dollars take their chances on the government's success in ensuring the future meaning of the dollar. Though the needs of the courts are perfectly well met by the current system, the public suffers because of the instability of the real value of the dollar. Even so, a great many contracts—bonds, mortgages, annuities, installment borrowing, and even some forward purchases of goods and services—continue to be written in terms of the United States dollar. And in nations whose monetary units are even less stable than the dollar, future obligations are frequently stated in terms of the dollar.

4.3 The Gold Standard

The definition of legal tender exclusively in terms of a paper liability of the United States government dates from the creation of the Federal Reserve in 1914. Before then, legal tender was gold or its equivalent in gold-backed certificates of the federal government. In effect, the dollar was defined as 0.04838 of an ounce of gold. If there arose a question about the settlement of a debt, the courts could ask if the appropriate amount of gold or an asset of the same value had been offered.

Though the United States government continued to issue a paper currency during the era of the gold standard (1879–1914) and to limit the rights of private banks to issue currency, the substantive effect of the policy came from the legal definition of the dollar, not from the govern-

ment's control of the money stock. Essentially the same control of prices could have been achieved just from the definition of legal tender, without any control of the private creation of money. In any case, there was no serious attempt to control the deposits of banks, which were a growing fraction of the money supply.

The gold standard dramatically limited inflation relative to what happened during the Civil War or the 1970s, but did not completely stabilize the price level by any means. Over the period from 1880 to 1910, annual rates of inflation measured over five-year intervals varied from -1.3% per year from 1890 to 1895 to 2.1% per year from 1905 to 1910. There was continual mild inflation around 2% per year from 1895 to 1910 because of shifts in the world supply of gold. Though annual rates of inflation never reached troublesome levels, the compounding of inflation year after year meant the gold standard was quite ineffective in stabilizing the long-run purchasing power of the dollar. Between 1895 and 1912, the cost of living rose 40% . Forward economic arrangements made in 1895 were seriously dislocated by the surprising decline in the real value of the dollar over the ensuing two decades.

Recent turbulence in gold markets casts even more serious doubt on the wisdom of a dollar defined in terms of a fixed quantity of gold. Between 1968 and 1970, the purchasing power of an ounce of gold fell by 18% . Then its purchasing power rose by 350% to a peak in 1974, declined by 32% over the next two years, and then rose by 600% to another peak in 1980. Had the United States been on the gold standard over this period, there would have been considerable inflationary pressure in 1968–70, 1974–76, and 1981, and crushing deflation in 1970–74 and 1976–80. Because a United States gold standard might have stabilized the gold market over this period had we been on the gold standard, it is not accurate to say that the changes in the United States price level would have been as large as the actual changes in the purchasing power of gold, but large changes in the price level would certainly have occurred. The fixed gold standard is not the answer for price stability.

4.4 Defining the Dollar in Terms of a Resource Unit

The gold standard is one instance of a more general technique for defining the dollar. Any commodity can take the place of gold, as long as the replacement is sufficiently homogeneous and easily measured. Further, the dollar can be defined in terms of a composite of several commodities. There was a serious proposal in the nineteenth century to define the dollar as half gold and half silver, which would have avoided some of the fluctuations of prices under the pure gold standard.

As a general matter, the dollar could be defined in terms of a resource unit containing a number of standardized commodities. Primary industrial and agricultural commodities are the logical candidates. To avoid the

instability of the gold standard, it is desirable to choose a resource unit whose value has moved closely with the cost of living historically. Then pegging its value by defining the dollar in terms of the resource unit will come close to stabilizing the cost of living.

After studying the relation between the cost of living and the prices of a long list of suitable commodities, I have selected a resource unit containing just four of them to serve as an example of a possible definition of the dollar. The long list contained wheat, sugar, heating oil, soybean oil, plywood, copper, tin, zinc, nylon, cotton, ammonium nitrate, latex, mercury, and aluminum. The four commodities whose combined price has moved closely with the cost of living are aluminum, copper, plywood, and ammonium nitrate. A resource unit that I will call the ANCAP comprising 33 cents worth of ammonium nitrate, 12 cents worth of copper, 36 cents worth of aluminum, and 19 cents worth of plywood (all in 1967 prices) had a market price very close to the cost of living throughout the postwar era. Its worst instabilities occurred in 1955, when the price of the resource unit rose by nine percentage points more than the cost of living, and in 1974, when the price of the unit rose by ten percentage points more. In 1970, the price of the unit fell relative to the cost of living by almost 9%. In other years, changes in the price of the resource unit have been closer to the changes in the cost of living. In particular, the gyrations of the United States and world economies in 1979 and 1980, with attendant high rates of inflation, brought about no important shifts in the price of the resource unit relative to the cost of living. In other words, had we defined the dollar as the resource unit, the cost of living would have been steady within two or three percentage points instead of rising by 11 and 13% in those two years.

4.5 Achieving Price Stability under a Commodity Standard

A fixed commodity standard will bring about fluctuations in the cost of living as the supply and demand for the resource unit ebbs and flows. Whenever the costs of producing the unit decline relative to the cost of living, the cost of living will rise and the public will complain about inflation. Exactly this happened in the first decade of the twentieth century. Under a fixed commodity standard, inflation is not a monetary phenomenon but a real one—it reflects the changing real circumstances of the economy.

A simple answer to the instability of prices under a commodity standard was offered by Irving Fisher in 1920 in his book *Stabilizing the Dollar*. The answer is just as good today as sixty years ago. What is needed is gradual adjustments in the definition of the dollar so that its purchasing power remains constant as time passes. When the commodities in the resource unit are in plentiful supply and inflation is consequently a problem, the number of resource units in the dollar needs to be

raised. To put it the other way around, the dollar price of a resource unit needs to be lowered to offset inflation as it occurs. Similarly, when the price level drops below target, the dollar price of the resource unit should be raised.

Readjustments in the dollar price of the resource unit could be the responsibility of the Federal Reserve Board just as the quantity of money is under the board's discretion in the present system. Much the same considerations would underlie the setting of the dollar price as permeate monetary policy today. A higher dollar price of the resource unit stimulates the economy in the short run and brings a higher cost of living in the longer run, just as monetary expansion does in the current system. Probably the major obstacle to ending inflation over the past decade has been the concern about the deep recession that is feared as a consequence of sharply lower money growth rates. Under a commodity standard, exactly the same concern would limit anti-inflation policy. There would be strong pressure for continual increases in the dollar price of the resource unit in order to keep up with the inflationary momentum built into the economy today. It is no more realistic to expect that the dollar price of the resource unit could be held constant under a commodity standard than it is to expect an immediate move to zero growth of the money stock under the present system.

Because discretionary monetary policy gave us the current high rates of inflation and has made almost no progress in reducing money growth so as to lower inflation, it is tempting to eliminate discretion and install a simple policy rule that would guarantee price stability. Within the commodity standard, a simple rule proposed by Irving Fisher seems very suitable: Every month, change the dollar value of the resource unit by a formula. The formula prescribes a 1% decrease in the dollar price for each percent by which the most recent cost of living index exceeds the target level. If the cost of living is below target, raise the dollar price by the same rule.

In the United States, the cost of living is measured by the Consumer Price Index (CPI), which is simply the market price of a rather extensive basket of goods and services. In effect, Fisher's formula defines the dollar as enough resource units to buy the CPI basket at its most recently measured price.

Adaptive redefinition of the dollar through the formula would lead ultimately to a price level very close to the target embedded in the formula. The duration of the adjustment process depends on the flexibility of the prices of the consumer goods in the CPI. Every redefinition of the dollar would bring immediate parallel responses of highly flexible prices in formal and informal auction markets. How soon the changes are transmitted to markets for finished goods and for labor is a matter of controversy among economists. If something like a Phillips curve governs wages and some prices, then the redefinition of the dollar brings unem-

ployment or boom. When some accident pushes the cost of living above the target, the formula calls for a lower dollar price of the resource unit. Sellers who do not adjust their dollar prices downward will be asking for more resources in return for what they are selling. There will be an excess supply of goods in all markets where prices do not fall immediately. On the other hand, there will be excess demand in the market for resource units, where the dollar price of output has declined, unless the dollar costs of inputs including labor also decline. Thus the redefinition of the dollar puts downward pressure on wages and prices throughout the economy. The only upward pressure is on the dollar price of the resource unit, which is fixed by the government's legal tender decree.

If wages and prices do not yield right away to the stabilizing pressure from the redefinition of the dollar, output and employment will fall. Sales of goods and services other than resource units will be constrained by inadequate demand because of their excessive prices. Output of resource units will be limited by supply, because the price has been depressed without an immediate compensating reduction in costs. In the aggregate, output and employment will fall. As prices and wages yield to the pressure of excess supply, full employment will be restored as the cost of living drops back to the target.

The Fisher formula is applied each month, and so intensifies pressure on prices and wages as time passes unless the cost of living returns to its target level. If many successive downward shifts in the dollar price of the resource unit are needed to coax the cost of living back to its target level after a disturbance, the real costs of the disturbance are correspondingly higher.

Aggressive redefinition of the dollar value of the resource unit is virtually a necessity in an economy with sticky prices and wages. Under a fixed commodity standard, all shifts in the purchasing power of the resource unit have to be accommodated by changes in the price level. When the resource unit becomes scarcer, the cost of living must fall. If this requires a prolonged period of excess supply, output and employment may be below potential for an excessively long time. With an adjustable commodity standard, the real consequences are much less severe. As soon as excess supply begins to drive the cost of living below the target, relief is obtained in the form of an upward movement in the dollar price of the resource unit. Monthly redefinitions continue until the new equilibrium is achieved at the target cost of living and a higher dollar price of the resource unit. The cumulative lost output and employment is far less than under the fixed commodity standard.

4.6 An Example of the Adjustable Commodity Standard

To give a fuller explanation of how an adjustable standard would work, I will give an extended example. The reader should understand that this is

an example, not a detailed proposal. It is still very much an open question whether a commodity standard can be made to perform as well as a conventional monetary system or, if it can, what characteristics it should have.

The first step in creating a workable commodity currency is to issue a detailed physical definition of the resource unit. Under a gold standard this is simply a matter of stating the amount and purity of the gold. For the four-commodity resource unit mentioned earlier in this paper, the ANCAP, much more needs to be said, and probably the Bureau of Standards would be the appropriate agency to provide the exact specifications of the resource unit. For the two metals in the unit, copper and aluminum, weight and purity are again the important characteristics. For plywood, the type of wood, the thickness, the type of adhesive, and the quality of the two outside surfaces have to be specified. For ammonium nitrate, the purity, the permissible levels of contaminants, and the moisture content are important. For all four commodities, quality specifications in great detail are made routinely in commercial contracts for delivery of the commodities, and these specifications would provide a guide for defining the resource unit in adequate detail for the courts.

In addition to the physical characteristics of the resource unit, it is important to prescribe the location. Gold is so valuable that its transport costs are negligible and it is unnecessary to specify where it is located when it is delivered to make a payment. For most other commodities, physical delivery to the creditor is undesirable and impractical. Instead, as in organized commodities markets today, a standard delivery point should be established for each commodity. Again, existing practices provide a guide for the definition of the resource unit.

The next step is to set the dollar price of the resource unit. Market enforcement of the price will be precise and immediate; it is impossible for the sum of the market prices of the amounts of the commodities in the resource unit to depart significantly from the announced dollar price of the unit. The reason is simple. If the sum of the prices exceeded the set price, then sellers would receive more than one resource unit in value every time they sold a unit. Remember that when sellers post a dollar price, they have the right to receive payment in resource units instead of any other form of payment. Sellers could make unlimited profits by selling and reselling, each time coming out ahead in resource units. Naturally, as they attempted to do so, they would bid down the prices of the commodities to the point where their sum was equal to the government's set price. Buyers would do exactly the same thing if the sum of the prices of the commodities fell short of the set price. Whenever the sum of the prices departed from the set price by more than transactions costs, an opportunity for covered arbitrage would become available, and experience in countless markets teaches that experts quickly eliminate all opportunities for covered arbitrage.

The dollar price of the resource unit could be set by the discretion of a government agency, just as the Federal Reserve Board sets the quantity of money today. But discretionary policy is exactly what has given us high rates of inflation for the past two decades, so the move to a commodity standard for the dollar should also involve a move to a fixed policy rule that guarantees the eventual return to a stable dollar. Something like Irving Fisher's rule is appropriate, though his proposal of monthly adjustments by the full amount of the error in the price level is probably much too aggressive. Instead, monthly adjustments one-twelfth as large seem to be about right. Accordingly, an example of a formula is: Each month, depress the dollar price of the resource unit by one-twelfth of the amount by which the most recent CPI exceeds the target level. Over the course of a year in which the CPI is consistently 1% too high, the dollar price will be lowered by a full percent. In other words, apply Fisher's formula monthly at annual rates. The monthly adjustment would rarely exceed a few tenths of a percent.

The final step in putting the economy onto the adjustable ANCAP standard is to decide on the appropriate target path for prices. The standard will keep the cost of living quite close to the path, so it is much more than the wishful thinking of previous government announcements of disinflation targets. Still, the conflict between gradualism and cold turkey policies is just as acute under a commodity standard as under the current monetary approach to price stabilization. Under gradualism, the target price path would eliminate inflation at one or two percentage points per year. In order to limit the adverse effects of disinflation on employment and output, the momentum of inflation is slowed gradually over a period of five to ten years. As public confidence grows in the success of the new approach to price stabilization, the decline in the target inflation rate could be made more aggressive. Sensible specific targets for the CPI are given in table 4.1. Again the target is not just wishful thinking. The dollar price of the resource unit is to be pushed as far as necessary to get the cost of living close to the target.

Table 4.1 Proposed Price Targets

Year	Level	Rate of Inflation
1980 (actual)	247	
1981	271	10
1982	296	9
1983	320	8
1984	339	6
1985	352	4
1986	359	2
1987 and after	359	0

How well would the economy function under the ANCAP standard? At first, the public would react with a healthy skepticism bred by numerous unsuccessful anti-inflationary policies of the past two decades. During this period, depressed employment and output would be a possibility, as the policy struggled against the public's instinct to continue raising wages and prices. As the public became convinced that the price targets were going to be met, the depressive effects would disappear. Whether the process would take six months or three years we do not know. In any case, by the middle of the decade the system would be close to its steady state. From then on, long-term stability of the cost of living would be guaranteed by the commodity standard. Short-run instabilities would remain. In years of plentiful commodity supply, the cost of living would rise a little, which would set in motion the automatic redefinition of the dollar to restore its purchasing power. The economy would experience a few months of mild inflation, followed by a few months of deflation as the redefinition took effect. At the same time, a boom in real activity would occur, possibly followed by a recession.

Periods of worldwide increases in commodity prices, as in 1973–74, would have the opposite effect, triggering a deflation and recession under the commodity standard. Subsequently, the dollar would be redefined to contain fewer resource units, the cost of living would begin to rise, and real activity would recover. However, it is an inherent feature of commodity standards that sharp changes in world commodity markets create fluctuations in an economy relying on the standard.

How would the ANCAP standard change daily economic life? Plainly, its most important effect would be the restoration of long-run stability in the purchasing power of the dollar. The many long-run dollar commitments made by the typical citizen—pensions, mortgages, employment agreements, bonds, and the like—would function again in the way they were originally intended to. To the nonspecialist, the change in the definition of the dollar would not have any other visible manifestations. Daily business would continue to be conducted in familiar ways; the option to take payment in commodities would never be exercised by anyone but an arbitrage specialist. The typical American would be no more aware of the system that enforced the definition of the dollar than is the tourist today who changes money in a foreign country is aware of the apparatus of the foreign-exchange market.

4.7 The Government Should Not Hold Commodity Reserves under a Commodity Standard

Under a commodity standard, the government will be tempted to intervene in markets for the commodities used to define the dollar. When some upward pressure on costs occurs, the government will be under

pressure to validate them by selling commodities rather than by letting the system push costs back down. In short, commodity sales from a reserve let the government deliberately create inflation, contrary to the intent of the commodity standard.

The postwar history of the United States illustrates this point very well. United States policy continued to peg the dollar price of gold at \$35 per ounce for several years after inflation got started. Not until the spring of 1968 was official intervention in the gold market halted. Stabilization of the price of gold was possible in the face of rising prices of almost everything else only because the government had accumulated an enormous gold reserve. Selling out of the reserve and so pegging the dollar price of gold did nothing to limit inflation.

Not only does intervention in commodity markets blunt the price-stabilizing power of the commodity standard, but it introduces an unacceptable instability of its own. If the government is committed to a policy of intervention, it constantly faces the danger of running out of reserves. History has shown repeatedly that governments do not react to exhaustion of reserves by letting the commodity standard work by itself after intervention becomes impossible. Instead, they protect reserves by raising the money price of the commodity, again an inflationary move.

For two reasons—the inflationary potential of government commodity sales and the likelihood of redefinitions of money to protect reserves—it is centrally important to prohibit government intervention in commodity markets. The role of the government should be limited to defining the dollar in terms of commodities, not trying to influence the relative price of commodities. That relative price should be set by private markets.

4.8 A Commodity Standard Is Not Clearly Superior to a Well-managed Fiat Money System

The preceding discussion suggests that we would have been much better off under the ANCAP standard starting in 1965 than we were under the blundering monetary policy we actually had. But blunders are just as possible under a commodity standard. The dollar price of the resource unit is a policy instrument similar in many respects to the money stock in our current system. It would have been tempting to raise the dollar price for the same reasons and under the same circumstances as we actually raised the money stock. Holding the line on the dollar price would have been excoriated as excessively restrictive policy just as holding the line on money would have been in the 1960s and early 1970s.

Under proper management, a fiat money system could promise long-run price stability through exactly the same kind of adaptive policy as Irving Fisher proposed for the commodity standard. If the Federal Reserve lowered the money stock whenever the cost of living exceeded the

target and raised it whenever the cost of living was too low, using the same rule—one-twelfth of a percent less money each month for each percent of excessively high prices—stability of the cost of living would be assured. Compared to a commodity standard, such a system would insulate the economy more effectively from commodity shocks, but at the cost of making it vulnerable to shifts in the demand for money. We do not know at this stage which type of shock is more destabilizing.

4.9 Conclusions

The gold standard is unacceptable as a basis for stabilizing the dollar because variations in the relation between the world price of gold and the United States cost of living are much too large. Under a gold standard, every drop in the demand for gold would bring sharp inflation. Even Irving Fisher's monthly redefinition of the gold content of the dollar could not keep up with the world gold market. A commodity standard based on more prosaic commodities whose prices have moved closely with the cost of living—for example, the ANCAP bundle mentioned in this paper—would do a good job of stabilizing the purchasing power of the dollar. Fisher's systematic redefinition is important to offset long-run changes in the relative price of the resource unit and the cost of living. A well-designed commodity standard would be a good way, but not the only way, to restore stability to the dollar.

Reference

Fisher, I. 1920. *Stabilizing the dollar*. New York: Macmillan.