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Volume Title: Money in Historical Perspective

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Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-74228-8

Volume URL: <http://www.nber.org/books/schw87-1>

Publication Date: 1987

Chapter Title: Alternative Monetary Regimes: The Gold Standard

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Chapter URL: <http://www.nber.org/chapters/c7511>

Chapter pages in book: (p. 364 - 390)

The gold standard has recently been the subject of much discussion. The discussion is largely attributable to dissatisfaction with the high and variable rates of inflation and interest rates, the low productivity growth, and the turbulence in foreign exchange markets since 1970. These undesired developments are associated with the existing discretionary fiat money regime, and they have encouraged examination of a monetary regime linked to gold, the vestiges of which the world abandoned early in the 1970s.

The desirability of a return to the gold standard is a controversial issue. Informed judgment of this issue requires an understanding of past experience. In addition, examination of the operation of the historical gold standard has intellectual interest. Scholars differ in their explanations of the functioning of the gold standard and in their assessments of its performance.

The historical gold standard evolved over centuries. It was a regime in which a particular weight of gold served as the supreme type of money with which all lesser types of money—government fiduciary issues, bank notes, and deposits—were interconvertible. During the gold standard era, the institutions and practices related to payments for the settlement of debts underwent evolutionary change.

In this chapter, we analyze the historical gold standard and its relevance to the solution of current economic problems. The first section surveys the evolution of the historical gold standard from the final decades of the nineteenth century to the collapse of the Bretton Woods system in the early 1970s. Section 15.2 presents the evidence on the performance of the gold standard as viewed by its advocates and opponents. Section 15.3 examines the necessary conditions for the res-

toration of the gold standard. Conclusions are summarized in section 15.4.

15.1 Evolution of the Gold Standard

Gold standards have varied historically depending on the presence or absence of the following elements:

1. a national money unit
2. nongold national money issued by either the government or by a fractional-reserve commercial banking system
3. a central bank
 - a. with gold reserves only
 - b. with mainly foreign exchange reserves
4. convertibility of nongold money into gold coin or gold bars
5. classes of holders for whom nongold money is convertible

15.1.1 National Money Units

Although a gold standard without national money units is conceivable—coins would circulate by weight with no price in a national money unit attached and prices would be expressed in weights of gold—the countries that adopted the gold standard before 1914 defined their national money units as a specific weight of gold. This set the price of an ounce of gold in terms of that unit. In 1879, for example, when the United States restored the link between the dollar and gold, after a 17-year interruption, the dollar was defined as 23.22 grains of fine gold. There are 480 grains of gold in a fine troy ounce. Thus the price of a fine troy ounce of gold was \$20.67 ($480 \div 23.22 = 20.67$). In all countries with a gold standard, prices of gold were set in terms of the country's national money unit—dollars, pounds, marks, francs, and other monetary units. Each government was committed to buying gold from the public at its fixed price and to converting the gold into coin. Each government was also committed to selling gold to the public at a slightly higher price. The difference between the purchase and sale prices is called *brassage*, the government's fee for manufacturing coins.

The external value of a national currency under the gold standard was determined by comparing it with another widely used currency. For instance, the pound sterling was worth \$4.8665 before World War I and from 1925 to 1931. Since the dollar was defined as 23.22 grains of fine gold and a pound sterling as 113.0016 grains of fine gold, a pound sterling had 4.8665 as much gold by weight as a U.S. dollar. The exchange rate between these two currencies was a fixed rate because the gold weight of each currency did not vary (or, equivalently, the price of gold per ounce in terms of each currency did not change).

Varying the weights of gold represented by a currency would have meant changes in the price of gold in that country.

The link between currencies was gold at a fixed price. Imbalances in international payments might be settled by claims in the form of bills of exchange in national currencies of other countries that had fixed gold equivalents. (A bill of exchange on a British firm, for example, is an order on the firm to pay a certain amount of British pounds to the exporter on a certain date. American exporters typically drew up such bills of exchange when they sold goods to foreign firms.) If the demand for and supply of a national currency did not balance, gold flows would be activated.

Thus, whenever the dollar price of a British pound at the official exchange rate of \$4.86 deviated by more than 1 or 2 percent above or below the official rate (these limits were referred to as the gold points and represented the cost of packing, insuring, and shipping gold between the two countries), it paid either to convert U.S. dollars into gold and transfer it abroad, or else to convert British pounds into gold and transfer it here. If U.S. demand for cheaper British goods increased, for example, this raised the dollar price of bills of exchange denominated in pounds. Once the dollar price of the pound reached \$4.92, the U.S. gold export point, it paid importers to convert U.S. dollars into gold, ship the gold to England, and purchase pounds at \$4.86. Conversely, at the U.S. gold import point, which might have been as low as \$4.83, it paid exporters to convert pounds sterling into gold, ship the gold to the United States, and purchase dollars. Gold shipments in either direction would thus restore the price of foreign exchange to parity.

Therefore, not only new gold output but inflows or outflows related to movements in the balance of payments affected the size of the domestic money supply. A reduction in a country's money supply and ultimately in its price level enhanced the country's appeal as a source of goods and services to foreigners and reduced the domestic demand for foreign goods and services. An increase in a country's money supply and ultimately in its price level diminished that country's appeal as a source of goods and services to foreigners and increased the domestic demand for foreign goods and services. Because of this automatic adjustment process, the duration and size of imbalances of international payments tended to be self-limiting. Gold flows served to equalize price movements across countries.

Economists debate the details of this process. Some argue that the gold flows before 1914 were minimal and that prices worldwide adjusted rapidly. There was one world price level, and the external adjustment process posed no greater problem than interregional adjustment of prices within a country. These refinements need not detain us.

15.1.2 Nongold National Money

As the gold standard evolved, substitutes for gold were developed. The motive for substitution was a reduction in the real resources employed in mining gold. Paper money substitutes may be produced with much smaller real resources. The substitutes included fiat currency issued by governments and commercial bank notes and deposits, with gold reserves of the government and the banks equal to a fraction of their monetary liabilities. The incentive to limit the size of the fraction of gold reserves was strengthened during trend periods when the supply of gold did not keep pace with the demand for it for both monetary and nonmonetary uses.

Fractional gold reserves were held as evidence of the issuers' readiness to convert nongold money into gold at the pleasure of the holder, at a fixed price of gold, not a changing market price of gold. In this system, domestic disturbances, such as banking panics, could affect the size of a country's gold reserves. Public alarm about the adequacy of the gold reserve ratio could trigger an internal drain of gold when holders of bank notes and bank deposits chose to shift to gold. The aftermath of such episodes was that the government and the banks subsequently took action to contract their monetary liabilities, and this resulted in an increase in their gold reserve ratios.

A fractional-reserve gold standard accentuated the effects of gold flows on the quantity of money. A \$1 gold inflow, depending on the size of the reserve ratio, might increase the quantity of money as much as \$8 or \$10; a \$1 gold outflow might reduce the quantity of money by as much as \$8 or \$10, with parallel effects on domestic spending and prices.

International capital flows, however, alleviated to some extent either the size of gold flows or their consequences. Short-term capital flows served to reduce and smooth the immediate flows of gold that would otherwise have been required to settle payments imbalances. Long-term capital flows enabled developing countries to borrow real resources from developed countries by running a persistent excess of imports of goods and services over exports of goods and services without entailing gold flows. In the event of a rise in the domestic quantity of money, in the short run, interest rates would tend to decline, inducing investors to shift funds to foreign money markets. The size of the change in export prices relative to import prices that would otherwise have occurred would be reduced by the resulting capital outflow.

In a fractional-reserve banking system combined with a gold standard, domestic and international convertibility of claims on the monetary authorities was the mechanism to ensure that the growth of the money supply was held in check.

15.1.3 Central Banks with Gold Reserves

Central banks in Europe predated the gold standard. After the gold standard was adopted, their behavior did not always exemplify the discipline a true gold standard imposes. They did not necessarily respond to a loss of gold due to balance of payments deficits by actions to reduce the quantity of money, or to a gain of gold due to balance of payments surpluses by actions to increase the quantity of money.

Scholars continue to debate the extent to which such behavior by the Bank of England and other central banks characterized the period before 1914. After World War I, the issue is not in doubt: central banks, including the Federal Reserve System, frequently chose not to permit gold flows either to expand or contract the quantity of money, or to do so to a lesser degree than full adjustment would have required. The gold standard was not automatic but became managed.

15.1.4 Central Banks with Foreign Exchange Reserves

Central banks also learned to economize on gold holdings by using other currencies as reserve assets, principally sterling before 1914, increasingly dollars thereafter. A central bank that held all or a large part of its international reserves in foreign exchange of a country that was on a gold standard was said to be on a gold exchange standard. The gold exchange standard was preferred because foreign exchange, in the form of deposits at foreign banks or foreign treasury bills, was earning assets, but gold holdings were not. A disadvantage of holding reserves in assets denominated in a foreign currency was that a central bank would incur losses when that currency was devalued.

The gold standard before World War I was often described as a sterling-gold exchange system and, under the Bretton Woods system after World War II, as a dollar-gold exchange system. Although both were fixed exchange rate systems in conception, the Bretton Woods system became a fixed but adjustable exchange rate system.

Under the Bretton Woods system, the par value of each national currency was established in agreement with the International Monetary Fund and was expressed either in terms of gold or in terms of U.S. dollars valued at 13.71 grains of fine gold. (The dollar of 23.22 grains of fine gold had been devalued by the United States under authority of the Gold Reserve Act of January 31, 1934, to 13.71 grains of fine gold—equivalent to \$35 an ounce.) Members of the International Monetary Fund were responsible for maintaining the par value of their currencies, with the United States alone undertaking the free purchase and sale of gold at the fixed price of \$35 per ounce. Other countries bought and sold their currencies for dollars to maintain their par values within the agreed limits. Settlement of international payments imbal-

ances took place mainly by transfers of reserve assets in the major money markets.

Convertibility of many European currencies was first achieved under the Bretton Woods system in 1958. The system performed fairly effectively for only a few years. From the mid-1960s on, the Bretton Woods system was characterized by repeated foreign exchange crises. Periodically market participants anticipated that the existing par values were unsustainable and would shift funds from a weak currency to a strong currency, exacerbating the external position for both currencies. Countries with undervalued currencies resisted revaluation and countries with overvalued currencies resisted devaluation.

The system of fixed but adjustable exchange rates collapsed under the pressure of persistent balance of payments problems: deficits in the United States, the reserve center, and surpluses (and undervalued currencies) in some countries such as West Germany. The money supply in the United States grew at rates independent of the country's balance of payments position. This was contrary to the way the money supply would have behaved under an international gold standard. Unless dollar inflows were sterilized by their monetary authorities, surplus countries accumulated dollar reserves that expanded their monetary base. According to the surplus countries, the United States exported inflation through its balance of payments deficits.

15.1.5 Convertibility of Nongold Money into Gold

A gold coin standard with nongold substitutes existed in a number of countries before 1914. Gold coin circulated but was only a small part of the total money supply, and nongold money was redeemable in gold coin. As a way of economizing on the use of gold, many countries ceased to coin gold after 1914 (the United States, not until 1933). This terminated free coinage, the circulation of gold coins, and the legal tender status of gold coins. The objective was to concentrate all of a country's gold holdings into international reserves available for international payments. Nongold money became convertible into heavy gold bars. Such a gold standard is known as a *gold bullion standard*.

15.1.6 Classes of Holders

Under a gold coin standard with nongold substitutes, all holders—domestic and foreign—of nongold money could convert it into gold coin. Under a gold bullion standard, convertibility existed for both types of holders. Under the Bretton Woods dollar-gold exchange standard, the right of convertibility in the United States was limited to foreign official institutions. Foreign official institutions held dollars for the purpose of intervention in foreign exchange markets so long as they were confident that they could obtain gold from the United States for

dollars at their initiative. For a time, a gentleman's agreement among central banks in certain industrial countries not to present dollar balances for convertibility into gold staved off the denouement. The chronic deficits in the U.S. balance of payments and the unwanted accumulation of dollars by foreigners that threatened a drain of all U.S. gold finally led in 1971 to formal inconvertibility for all holders.

Initially, the United States and its trading partners made several attempts to restore a system of fixed exchange rates. After much negotiation, a readjustment of currency parities was arranged at a meeting at the Smithsonian Institution in Washington on December 17–18, 1971. Wider margins of fluctuations above and below the new so-called central exchange rates were permitted. The official dollar price of gold would henceforth be \$38, a devaluation of the dollar of 7.9 percent. While the dollar remained inconvertible, the new official dollar price of gold implied a depreciation of the gold value of the dollar rather than an appreciation of the gold value of other currencies. The central exchange rates established at the Smithsonian meeting lasted only a short time as market participants expressed disbelief in them.

In February 1973, new central rates were set in a hurried round of negotiations. The official dollar price of gold was raised further to \$42.22, leaving unchanged the gold value of other currencies. The new central rates did not staunch the flow of dollars abroad, and another crisis erupted in March 1973. As a result of this crisis, exchange rates pegged to the dollar were abandoned by the major industrialized countries. Amendments to the Articles of Agreement of the International Monetary Fund formally removed gold from its previous central role in international monetary arrangements. The International Monetary Fund's official gold price was abolished, as were par values, gold convertibility, and maintenance of gold value obligations.

15.1.7 Arguments for a Gold Standard

Supporters of the gold standard have several basic arguments in favor of a gold standard of whatever variant. The first argument is that gold has intrinsic value and therefore serves as a standard of value for all other goods. In addition, supporters view gold as a desirable store of value because new production adds only a small fraction to the accumulated stock. Because of this, prices denominated in gold do not vary greatly from year to year. Even if other forms of money such as government-issued or bank-issued paper currency and bank deposits exist, convertibility into gold at a fixed price would compel the monetary authorities to avoid inflationary policies.

An inflationary increase in government paper currency, for example, would tend to raise prices of goods and services in terms of paper currency, and induce money holders to convert their paper dollars to

gold, putting pressure on the government's gold holdings. At the same time, with gold as a country's international reserve asset, adjustment to balance of payments deficits and surpluses would be automatic. An increase in the money supply by ultimately raising the price level would raise the price of exports relative to the price of imports, leading to a balance of payments deficit and a gold outflow. In addition, the increase in the money supply would lower domestic interest rates relative to those abroad, inducing a capital outflow and a further gold outflow. In such a monetary system, political manipulation of the money supply would be avoided.

Another argument in favor of the gold standard is that the rate of increase in the gold money supply would vary automatically with the profitability of producing gold and would assure a stable money supply and stable prices in the long run. A rapid increase in the output of gold due to gold discoveries or technological improvements in gold mining, for example, would raise the prices of all other goods in terms of gold, making them more profitable to produce than gold and ultimately leading to a reduction in gold output. The reduction in the purchasing power of gold, moreover, would lead to a shift in the demand for gold from monetary to nonmonetary uses, thus reinforcing the output effects. Conversely, a decline in prices of goods and services, due to technological improvements in the nongold sector, would increase the profitability of gold production, encouraging increased gold output, which would ultimately tend to raise the price level. The initial increase in the purchasing power of gold would also lead to a shift in the demand for gold from nonmonetary to monetary uses, thus reinforcing the output effects. Long-run price stability would be the result.

In the following section, we evaluate the evidence for these arguments.

15.2 Evidence on the Performance of the Gold Standard

Assessment of the performance of the historical gold standard is based on the following issues:

1. What was the behavior of prices under the gold standard? Price behavior can be analyzed from three perspectives:
 - a. long-run price predictability—the ultimate return of the price level to its initial value
 - b. long-run price stability—the price level neither rising nor falling over substantial periods
 - c. short-run price stability
2. What was the behavior of short-run real output under the gold standard?
3. In the world's markets, did the gold standard transmit foreign shocks both of a monetary and nonmonetary character?

4. How great was the magnitude of resource costs associated with maintaining the gold standard?
5. Was the gold standard free from political manipulation?

Economists differ in their assessment of these issues. The gold standard is often described as a rule that governs monetary policy. The rule is that the domestic money supply must rise and fall in line with the rise and fall of gold reserves. Adhering to the gold standard rule is described as a form of precommitment by monetary authorities. As explained in chapter 1 of Campbell and Dougan (1986), one respect in which economists differ in assessing the gold standard is in their judgment of the advantage of precommitment to a rule versus the advantage of discretionary actions by monetary authorities. As explained in chapter 4 of Campbell and Dougan, even those who favor precommitment are not unanimous in supporting the gold standard. Some prefer an alternative rule such as stable monetary growth. We now review the evidence concerning the five issues listed above.

15.2.1 Behavior of Prices under the Gold Standard

Table 15.1, row 1, shows that in both the United States and the United Kingdom the average annual rates of change in wholesale prices during the pre-World War I period were much lower than in the post-World War II period. Table 15.2 compares the negative average rates of change in the implicit price deflator in the United States and the United Kingdom from the 1870s to the 1890s with the average rates of inflation from the 1890s to World War I. Although the contrast in table 15.1 between the close to zero rates of change of prices in the gold standard period from the 1870s to World War I compared with the inflation in the period from 1946 to 1979 has been interpreted by some (Bordo 1981; Cagan 1984) as demonstrating near-stability of prices under the gold standard, Cooper (1982) and Dornbusch (Report 1982, pp. 414–15) have pointed out that this conclusion is not supported by the standard deviation of price changes shown in table 15.1, row 2.

Moreover, the latter argue that the very wide fluctuations in the wholesale price index from 1816 to 1913 shown in table 15.3 in the United States, United Kingdom, Germany, and France are hardly a pattern of long-term stability. (A problem with table 15.3 is that it includes dates for the four countries when they were not on the gold standard—1816 for the United Kingdom, 1873 for the United States, and the initial dates for both Germany and France.) Cagan (1984) has replied that although there was indeed a substantial decline in wholesale prices before 1896 followed by an even greater increase before 1914, during the post-World War II period, in which there was a loose or

Table 15.1

A Comparison of Selected Economic Variables from the 1870s to World War I under the Gold Standard and from 1946 to 1979, United States and United Kingdom

Measure	United Kingdom		United States	
	Gold Standard, 1870–1913	Postwar, 1946–1979	Gold Standard, 1879–1913	Postwar, 1946–1979
1. Average annual change in wholesale prices (percentage) ^a	-0.7	5.6	0.1	2.8
2. Standard deviation of price change (percentage) ^b	4.6	6.2 ^c	5.4	4.8 ^c
3. Average annual growth in real per capita income (percentage)	1.4	2.4	1.9	2.1
4. Coefficient of variation of annual percentage changes in real per capita income (ratio) ^d	2.5	1.4	3.5	1.6
5. Average unemployment rate (percentage)	4.3 ^e	2.5	6.8 ^f	5.0
6. Average annual growth in the money supply (percentage) ^a	1.5	5.9	6.1	5.7
7. Coefficient of variation of the growth in the money supply (ratio) ^d	1.6	1.0	0.8	0.5

Sources: Richard N. Cooper, "The Gold Standard: Historical Facts and Future Prospects," *Brookings Papers on Economic Activity* 13 (1982), 5. The table is drawn from Michael D. Bordo, "The Classical Gold Standard: Some Lessons for Today," *Federal Reserve Bank of St. Louis Review* 63 (May 1981), 14, and calculations from George F. Warren and Frank A. Pearson, *Gold and Prices* (New York: John Wiley & Sons, Inc., 1932), pp. 13–14, 87; Brian R. Mitchell, *Abstract of British Historical Statistics* (London: Cambridge University Press, 1962), pp. 367–68; Council of Economic Advisers, *Economic Report of the President, January 1982* (Washington, D.C.: Government Printing Office, 1982); and International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF), various issues.

^aCalculated as the time coefficient from a regression of the log of the variable on a time trend.

^bCalculated as the standard error of estimate of the fitted equation $\ln P_t = a \ln P_{t-1}$, where P_t is the wholesale price index in year t .

^c1949–79.

^dCalculated as the ratio of the standard deviation of annual percentage changes to their mean.

^e1888–1913.

^f1890–1913.

Table 15.2 Rate of Change in Prices and Real Income between Cycle Phases,^a 1873–1914, United States and United Kingdom

	Percentage Change per Year		
	Implicit Price Deflator (1)	Real Income (2)	Real Income per Capita (3)
United States			
<i>Deflation:</i>			
From the 1873–78 contraction to the 1895–96 contraction	– 1.5	3.6	1.4
From the 1878–82 expansion to the 1895–96 contraction	– 1.3	2.5	0.3
<i>Inflation:</i>			
From the 1895–96 contraction to the 1913–14 contraction	1.9	3.8	1.9
United Kingdom			
<i>Deflation:</i>			
From the 1874–79 contraction to the 1893–1900 expansion	– 0.6	2.3	1.4
<i>Inflation:</i>			
From the 1893–1900 expansion to the 1913–14 contraction	0.8	1.6	0.8

Sources: Phillip Cagan, "The Report of the Gold Commission (1982)," in *Monetary and Fiscal Policies and Their Application*, Karl Brunner and Allan H. Meltzer, Ed., Carnegie-Rochester Conference Series on Public Policy, vol. 20 (Amsterdam: North-Holland, 1984), pp. 247–67; Milton Friedman and Anna J. Schwartz, *Monetary Trends in the United States and the United Kingdom* (Chicago: University of Chicago, Press, 1982), based on tables 5.7 and 5.8.

^aThe cycle phases are from the National Bureau of Economic Research reference cycles. See U.S. Department of Commerce, *Business Conditions Digest* (February 1984), p. 104.

nonexistent tie to gold, wholesale prices quadrupled the rise under the gold standard.

Although the decline and rise in prices between the 1870s and World War I nearly canceled each other, that reversal is dismissed by gold opponents as accidental. Contemporaries, it is contended, could hardly have known that the price level following a period of decline would be restored by a period of price increase. Even if it were in part accidental, the tendency for declines or increases in prices to be reversed after a long lag is a basic characteristic of a commodity standard, as Cagan (1984) notes. Although the gold standard did not provide short-term or long-term price stability, it did provide long-term price predictability—the price level returned to its initial level.

Table 15.3 **Level and Percentage Change of Wholesale Price Indexes for the United States, United Kingdom, Germany, and France, Selected Years, 1816–1913**

	United States	United Kingdom	Germany	France
Year:	(1913 = 100)			
1816	150	147	94	143
1849	82	86	67	94
1873	137	130	114	122
1896	64	72	69	69
1913	100	100	100	100
Period:	Percentage Change			
1816–49	–45	–41	–29	–33
1849–73	67	51	70	30
1873–96	–53	–45	–40	–45
1896–1913	56	39	45	45

Sources: Richard N. Cooper; "The Gold Standard: Historical Facts and Future Prospects," *Brookings Papers on Economic Activity* 13 (1982), 9. Data for the United States and the United Kingdom are from George F. Warren and Frank A. Pearson, *Gold and Prices* (New York: John Wiley & Sons, Inc., 1955), pp. 87–88; data for Germany and France are from Brian R. Mitchell, *European Historical Statistics, 1750–1970* (New York: Columbia University Press, 1975), pp. 736–39.

The use of the wholesale price index to measure price trends has been criticized by Reynolds (1983), a proponent of the gold standard. He claims that because the wholesale price index was dominated by farm commodity prices, it did not reflect changes in the purchasing power of gold; the decline in 1894–96 was only an "apparent" deflation. This criticism is not supported by other information about prices. The implicit price deflator paralleled the wholesale price index, and accounts of the period leave no doubt that the price movements as measured by the wholesale price index were not merely statistical artifacts.

The concept of the gold standard as a guarantor of price stability was criticized by prominent contemporaries. What occasioned the criticism was precisely the long-term secular price movements—the rise in prices associated with the mid-nineteenth-century gold discoveries and the decline in prices that began in the 1870s under an expanding international gold standard. In his (1863) pamphlet, "A Serious Fall in the Value of Gold Ascertained, and Its Social Effects Set Forth" (1884), William Stanley Jevons estimated that between 1848 and 1860 the value of gold fell 9 percent. In 1875 he questioned the use of metallic standards of value in view of the extreme changes in their values and urged as a reform a tabular standard of value, to be based on an index number.

In 1887 Alfred Marshall (1925, pp. 189, 192) discussed “the evils of a fluctuating standard of value” and concluded that “the precious metals cannot afford a good standard of value.” He dismissed bimetallism as flawed and proposed as remedies for the fluctuating standard of value either symmetallism or a tabular standard. With the reversal of the secular price movement after 1896, concern shifted to the inflationary fluctuation of the standard. In 1913 the remedy that Irving Fisher (1913) proposed was the “compensated dollar,” raising the gold content of the dollar (lowering the price of gold) to offset inflation, lowering the gold content of the dollar (raising the price of gold) to offset deflation.

It has been suggested by Cagan (1984) that the problem created by the tendency of gold (or any commodity) to drift in terms of its purchasing power, due to changes in the relative demands for and supplies of gold (or any commodity), is not serious since it can be solved by periodically adjusting the gold content of the dollar in line with Fisher’s proposal. If the price index rose 2 percent, for example, the gold content of the dollar would be increased 2 percent. The reduced price of gold would reduce the value of the gold reserve and discourage inflows both from domestic and foreign gold holdings. This would reduce the growth rate of the money supply. Downward pressure on prices would eventually stabilize the price index and a long-run drift of prices would be avoided.

Implementing this proposal might have several undesirable effects: speculative buying and selling of gold, international complications if prices moved idiosyncratically in one country, and overshooting because of lags in the response of prices to changes in the money stock. Despite these problems, the main contention of the proponents of this proposal is that since there is a solution to the problem of long-run drift, drift cannot be a serious objection to the gold standard.

However imperfect the record of price behavior under the gold standard, the main argument in its favor is that inflation rates were never as high and variable as in the post-World War II period. Moreover, because the gold standard promoted long-term domestic and international price predictability, it provided incentives to private market agents to make long-term contracts, which are vital for the efficient operation of a market economy. In the inflationary environment since the mid-1960s, markets have increasingly shunned long-term contracts with a consequent loss of economic efficiency.

15.2.2 Behavior of Short-run Real Output

Table 15.1, rows 3 and 4, shows that the average annual growth in real per capita income was higher from 1946 to 1979 in both the United States and the United Kingdom than from the 1870s to World War I. Also, this table shows that the variability (coefficient of variation of

annual percentage changes in real per capita income) was smaller from 1946 to 1979 than in the earlier period. Table 15.2, columns 2 and 3, shows that real output in the United Kingdom rose more rapidly during deflation than during inflation in the period from the 1870s to World War I; in the United States real output grew more rapidly during periods of inflation than in periods of deflation. Again, as in the case of price behavior, conflicting assessments have been made of these data on output behavior. Opponents of the gold standard interpret this evidence as showing both lower annual average growth in real per capita income and greater instability of the growth rate under the gold standard than during the post-World War II period. They also cite higher unemployment rates under the gold standard than during the later period (table 15.1, row 5).

Proponents of the gold standard question the reliability of the estimates of national income and of unemployment in years past. Also, they cite the slowdown in real per capita income growth in 1979–82 as reversing the favorable comparison of the post-World War II period relative to gold standard years. In addition, they believe that the high unemployment in the 1890s may have resulted from the surge in immigration despite growing employment.

Banking panics were frequent under the gold standard, and sharp monetary contractions that produced output instability occurred in 1884, 1890, 1893, 1907, and 1914 (see table 15.4). The issue is whether greater stability of monetary growth in the post-World War II period (table 15.1, lines 6–7) is explainable by the shift from the gold standard. The improvement may instead reflect the establishment of the Federal Deposit Insurance Corporation, which stabilized money growth relative to growth of the monetary base (Barro 1984). If similar structural changes

Table 15.4 **A Comparison of U.S. Business Cycles in 1879–1897 (Period of Deflation) and 1897–1914 (Period of Inflation)**

Years	Duration in Months		Average Change in Economic Activity (percentage)	
	Expansions	Contractions	Expansions	Contractions
1879–1897	123 (56%) ^a	96 (44%)	21.7	– 22.2
1897–1914	109 (52%)	101 (48%)	20.0	– 18.7

Sources: Phillip Cagan, "The Report of the Gold Commission (1982)," in *Monetary and Fiscal Policies and Their Application*, Karl Brunner and Allan H. Meltzer, eds., Carnegie-Rochester Conference Series on Public Policy, vol. 20 (Amsterdam: North-Holland, 1984), pp. 247–67. Based on Geoffrey H. Moore, ed., *Business Cycle Indicators*, vol. I (Princeton: Princeton University Press for National Bureau of Economic Research, 1961), pp. 104, 671.

^aPercentage of total period is in parentheses.

had been introduced under the gold standard, the low year-to-year variability in the world's monetary gold stock might have resulted in greater relative stability of money growth and of real variables.

The behavior of real output under the gold standard was not exemplary, but if allowance is made for factors unrelated to the gold standard that may account for the deficiencies, the record is respectable.

15.2.3 Monetary and Nonmonetary Foreign Shocks

Gold proponents extol the fixed exchange rates under the gold standard for the efficiencies resulting from a stable international money that integrated the world's commodity and capital markets.

To opponents of the gold standard, a disadvantage of these fixed exchange rates is that they transmitted monetary and nonmonetary disturbances to other countries. Before World War I, such disturbances typically were related to shifts in capital exports by Great Britain from one part of the world to another, for example, the shift from investment in U.S. railways to South American projects in the late 1880s or the significant decline in aggregate British capital exports to all countries in the 1890s. Also, business cycles tended to be synchronized under the gold standard. A boom in one country would lead to an increase in demand by its residents for goods and services in the rest of the world. The opposite happened when there was a recession. To preserve fixed exchange rates, gold flows required actions by monetary authorities or the banking system.

Changes in U.S. tariffs were a type of nonmonetary disturbance that was transmitted to the rest of the world. The Dingley Tariff of 1897 imposed the highest import duties in history to that date, and the Smoot-Hawley Tariff of 1930 raised tariff rates on imported commodities, notably agricultural imports, well above postwar levels. Since the United States was a relatively closed economy, keeping imports out of the United States injured its trading partners more than it did the United States. Smoot-Hawley not only reduced the exports of our trading partners and aggravated the decline in their terms of trade but also led to the eventual default of their foreign debts. The gold standard required short-term domestic adjustments to correct balance of payments disequilibria that arose from policies transmitted by fixed exchange rates from other countries.

An additional problem under the gold standard was that capital movements were sometimes uncontrollable and aggravated the underlying situation that generated the capital flows. Raising the discount rate at the beginning of the Great Depression did not stop the capital flight but intensified that flight and was interpreted as a signal that further flight would lead to devaluation. At the same time, the discount-rate rise served to heighten deflationary pressures on the domestic economy.

The gold standard was thus charged with having contributed to the instability of the world economic system after 1929.

Professional support of a paper standard to replace the gold standard gained ground in the 1930s. This support, however, was tempered by the belief that unrestrained, a paper standard would encourage beggar-thy-neighbor policies. The Bretton Woods system embodied the views and experience of the 1930s. It was widely believed that pegged exchange rates were essential to prevent chaos in international financial and trade transactions, but national economies should be free to restrict capital flows and to devalue the international value of their currency whenever necessary. This would make it possible to avoid deflating domestic prices when there was a balance of payments deficit in current account. Under the Bretton Woods system, the objectionable feature of pegged rates that forced governments to implement monetary changes that conflicted with goals of full employment or price stability would be removed, and at the same time stable conditions in foreign exchange markets would be assured.

15.2.4 Resource Costs Associated with Maintaining the Gold Standard

For prices to remain stable under a gold standard, the monetary gold stock must increase at the same rate as the demand for money rises in response to real income growth plus or minus any change in the ratio of GNP to the money stock (a change in velocity). A well-known estimate for the United States by Milton Friedman (1951b, p. 210) was that something over a 4 percent per year increase in the monetary gold stock would have been required to maintain price stability under a gold standard from 1900 to 1950. "Something over 4 percent" was derived as the sum of an average rate of growth of real income of 3 percent per year plus an average decline in velocity of 1 percent per year. With the money stock about half the size of national income, neglecting the change in velocity, about 1.5 percent of the national income would have to be devoted to the increase in monetary gold in order to maintain stable prices.

The world's monetary gold stock before 1929 did not grow at a constant 4 percent annual rate of increase. It grew by much smaller amounts (1 percent in the 1880s, 3 percent in the 1890s, 3.8 percent in the 1900s, 3 percent in the 1910s, 2 percent in the 1920s). In these decades, nongold money substitutes, however, increased at a rate far exceeding the rate of increase in monetary gold.

The resource cost of a gold standard has not played a significant role in current discussions (Cagan 1984). The issue has either been ignored or dismissed except by gold standard proponents. To them, high resource costs are a positive value of the gold standard since gold is

regarded as having intrinsic value. It is difficult to reconcile this argument with the historical trend toward increasing use of substitutes for gold in circulation and in reserves. The market appears to seek means to achieve lower resources costs.

15.2.5 Political Manipulation

Under a fully functioning gold standard, government intervention in the determination of the price level and the overall level of economic activity is limited. How closely did the historical gold standard approximate the ideal?

There were two kinds of intervention: in the gold mining industry and in the required short-term adjustments of prices and incomes to maintain fixed exchange rates.

Since the demand for gold was perfectly elastic with respect to its nominal price under the historical gold standard, government actions to stimulate gold mining during periods of falling prices and low real output would be stabilizing (Rockoff 1984). It is possible to interpret the legalization of hydraulic mining in California in 1893 in this light. Farmers had earlier succeeded in closing down hydraulic mines because debris from the mines ruined farmland downstream. The act authorizing the restoration of such mining was intended to stimulate a depressed industry as well as to expand the money supply. Possibly the extension of the railroad network into gold mining areas in the United States and Mexico also represented government support for the industry. There is also evidence of government regulation of the gold mining industry by means of direct and indirect taxation, as in South Africa.

Government intervention in gold mining, however, was not necessarily stabilizing. Profits in gold mining decline when prices in general (costs) rise. Government aid to the industry at times of inflation would inhibit an equilibrating decline in gold output. Recent actions by the Soviet Union and South Africa apparently to take advantage of the strategic role of gold have disregarded possibly destabilizing consequences.

Political conflict has obviously played a part in affecting the world's gold supply. Gold production declined during the Latin American wars of independence in 1815 and in the twentieth century during the Mexican and Russian revolutions. However, most gold output under the historic gold standard came from politically stable parts of the world, so wars and revolutions did not significantly affect world production. For example, although the Boer War interrupted gold production in South Africa, the effect on the total supply of gold in the world was limited.

There is disagreement about the amount of intervention by monetary authorities before 1914 in the operation of the gold standard. Some

scholars deny that intervention was possible or that authorities ever exercised such an option; they believe international arbitrage in the commodity and capital markets operated quickly to equalize prices and interest rates worldwide without the need or opportunity for intervention by monetary authorities. Others interpret selected actions by monetary authorities as discretionary and interventionist. However, the gold standard could function effectively even if the kind of response by monetary authorities required by the gold standard was delayed. Though there was leeway in reducing monetary growth when gold or capital movements were decreasing the domestic monetary base, ultimately, given fixed exchange rates, monetary growth had to be reduced. Also, though there was leeway in accelerating monetary growth, if such action was not ultimately taken, the system would be undermined by maldistribution of gold and unequal burdens of adjustment across countries.

In the post–World War I period, intervention was indeed exercised by the monetary authorities. For example, from 1923 to 1929 the Federal Reserve System offset inflows of gold by open market sales of government securities and outflows by open market purchases. Federal Reserve credit moved inversely with movements in the gold stock. France also did not permit gold inflows to affect its money stock and prices after returning to the gold standard in 1928 at a parity that undervalued the franc. Similarly, gold standard requirements were ignored by the Federal Reserve System in 1929–31, when gold inflows were not matched by an expansion of the U.S. money stock and the quantity of money was even permitted to decline. After 1934, both inflows and outflows of gold were not permitted to affect monetary growth and the performance of the economy. When gold reserve ratios applicable to Federal Reserve deposits and notes approached the minimum legal requirement, the minimum was lowered and eventually abolished. Gold became a symbol rather than an effective constraint on the monetary authorities.

The Bretton Woods system had no provision requiring the internal supply of a country's currency to be governed by its gold holdings, as was the case before 1914, nor was there a requirement that a country had to undergo deflation or inflation to balance its external accounts. Although fixed exchange rates carried over to the post–World War II world, they were fundamentally divorced from gold standard restraints. The monetary system was fully subject to political control.

15.3 Conditions for the Restoration of the Gold Standard

A variety of proposals exists to restore the use of gold in some form in monetary arrangements. Here we limit consideration to two pro-

posals: that the United States should unilaterally return to a domestic gold standard or alternatively that the industrialized countries should collectively agree to establish an international gold standard.

To achieve long-run price stability, advocates of a restoration of a domestic gold standard recommend that the government establish a new official fixed price of gold (by defining the dollar by its weight in gold) and maintain this price by buying and selling gold freely. The government would also maintain a ratio, possibly with upper and lower bounds, of the stock of gold to the total amount of Federal Reserve notes in circulation (or the monetary base); the Federal Reserve System would be required to reduce its monetary liabilities consisting of Federal Reserve notes (or the monetary base) when the reserve ratio declined and expand them when it rose. Legal tender gold coins, denominated in dollars, would be issued to serve both as hand-to-hand currency and as legal reserves for commercial and other bank deposits. No restrictions would apply to ownership of gold coin or bullion. Nongold currency would be convertible into gold on demand.

Under the alternative proposal for an international gold standard, the United States would fix the price of gold and then maintain fixed exchange rates with other countries after they defined the amount of gold in their monetary unit. Such a standard could be achieved either by international agreement or by evolution—the United States could be the first to reinstitute the fixed price of gold and other countries would follow suit. International payments imbalances would be settled by gold flows or by flows of dollars or dollar assets convertible into gold at the fixed price. The monetary base and the money supply would vary with gold flows.

To implement a restoration of either a domestic or international gold standard in the United States requires the solution of a series of interlocking problems.

15.3.1 Choosing the Price of Gold

A basic problem is called the *reentry problem*: how to determine the right fixed price at which to resume the convertibility of the dollar into gold. In the past, when a country reinstated the gold standard, there was an old official price that was once again restored or that served as the base for revaluation or devaluation. The last official price of an ounce of gold, \$42.22, is so out of line with current market prices of gold that it provides no guidance. The risk involved in choosing the wrong price is great. An incorrect price might lead to a huge inflow of gold and inflation if it were too high, or a huge outflow and economic contraction if it were too low.

There are three principal proposals to solve the reentry problem:

1. Arthur Laffer (1980) proposes that an announcement be made by the government that at a date some months hence a dollar unit of the

monetary base of the Federal Reserve System would be linked to a fixed quantity of gold at that day's average transaction price in the London gold market. That would become the official price of gold in terms of dollars henceforth. If the price were too high or too low, the proposal recommends suspension of convertibility. The procedure would then be repeated, with a new announcement that convertibility would be reinstated at a future date at the price then prevailing in the market. Unfortunately, the proposal could result in instability in the price of gold as speculators bid up the price before the end of the first announcement period. Then if convertibility were suspended because the price was too high, speculators would unload gold and the price of gold would probably fall very low before the end of the second announcement period. Prospects for suspension of convertibility would be destabilizing and would probably undermine confidence in the system.

2. Another way to arrive at an equilibrium price of gold is to follow the approach of Robert Aliber (1982). He takes the price of \$35 per ounce in 1961, a year when the United States had virtual price stability, as an initial equilibrium price. Assuming no other factors have affected the real price of gold, since 1961 the nominal price should have increased to the same extent as the U.S. price level plus a return equal to the real rate of interest. The U.S. consumer price index tripled between 1961 and 1980; hence for that reason alone the nominal price of gold should have been \$105 in 1980. With the change in the world consumer price index, the price should have been \$155.

Other factors have affected the real price of gold in addition to the increase in the general price level. If world real income elasticity of industrial demand for gold is assumed to be 1.85 (based on econometric results for 1950–80), and the increase in world income is approximately 83 percent (based on an index of world real GNP), the demand for gold would have increased 154 percent (83 percent of 185) from 1961 to 1980. During the same period, the total world gold stock increased 35 percent. Thus the excess demand for gold amounted to about 120 percent ($154 - 35 = 119$). The real price would also have increased about 120 percent if we assume that the price elasticity of industrial demand for gold is -1 (that is, the percentage increase in the quantity demanded is just equal to the percentage decrease in the price) and that the price elasticity of supply is close to zero. Based on this estimate, the equilibrium price of gold in 1980 would have been between \$230 and \$340 ($105 \times 2.2 = 231$ and $155 \times 2.2 = 341$). This calculation assumes that factors affecting the net asset demand for gold are transitory and would vanish once price stability under a gold standard is restored.

Assume that a gold standard is restored with the price per ounce of gold set within the calculated range of \$230 to \$340. In the current free market, a monetary demand essentially does not exist. Under a reinstated gold standard, a monetary demand for gold would recur be-

cause the government must satisfy all demands for gold at that price. Only after the monetary demand for gold had been accommodated would the nonmonetary demand for gold be satisfied. Thus econometric results for the asset demand relationship for 1969–80 of a 1 to 2 percent real income elasticity would no longer be relevant. The supply equation, however, would presumably be unaffected by a return to the gold standard. The question then resolves itself into the adequacy of the supply relative to the prospective monetary and nonmonetary demand for gold.

3. A third approach to the problem of the price at which to reinstitute the gold standard seizes on the opportunity the selection offers to adopt simultaneously a 100 percent gold reserve against the money supply. The price of an ounce of gold is to be determined, under this scheme, by dividing a money aggregate, such as the M1 measure of the U.S. money supply, by the number of ounces of gold held by the Treasury. One such calculation yielded a price of \$1,500 per ounce. A variant of this approach divides the world dollar GNP by the world stock of monetary gold, yielding a price of \$3,500 per ounce. Under either variant, a massive inflation would probably result. Because of the increase in the price of gold, production of gold would be very profitable, and the output of gold would be increased. This would increase the supply of money and the prices of goods and services until prices rose sufficiently to bring an end to the exceptional profits from gold mining.

15.3.2 Profits of Gold Devaluation

When the price of gold is raised, one dollar is equal to a smaller quantity of gold. This is called *gold devaluation*. All holders of gold profit when the price is raised. Assuming that the profits received by the Federal Reserve banks or the U.S. Treasury from a rise in the price of gold (gold devaluation) were sterilized in some fashion, would other central banks in the rest of the world also sterilize the gold devaluation? If not, the United States would be open to the transmission of inflation from foreign economies that chose to monetize the profits of revaluation. The reserve deposits of commercial banks at a foreign central bank that did not sterilize the gold devaluation would increase, and this would increase the money supply and prices in that country.

15.3.3 Pegging the Gold Price

Once a presumably correct price of gold had been determined, the principal central banks would then have to peg it. To prevent a rise in the price of gold, central banks would have to sell gold from existing stocks. To support the price, central banks would have to engage in open market purchases, with possible inflationary consequences. The pegging operation might conceivably be successful; responsibility for

intervention in the gold market might be managed as it was under the Gold Pool of 1961 when the Bank of England acted as agent for the members of the pool. To be successful, all countries would have to support the effort, and there must be no changes in the exchange rate of any country. If a country changed its exchange rate, this would constitute a change in the price of gold in that country. Changes in the price of gold would encourage speculation in gold markets.

15.3.4 Linking the Domestic Money Supply to Gold Reserves

Once a pegged price of gold was established, a next step for reinstatement of the gold standard would be to link the domestic money supply to the country's gold reserves. The immediate problem would be to determine the conditions for convertibility of paper currency into gold.

Under a limited U.S. gold standard with convertibility between gold and the dollar available only to residents of the United States, the problem of how to enforce the limitation of convertibility appears intractable. Residents might be required to declare under oath that they were acting for themselves or for other residents, but not for foreigners, when demanding gold or supplying gold at the gold window. Alternatively, gold imports and exports might be embargoed. Opportunities for profitable violation would arise whenever there were discrepancies between the U.S. fixed price and the world market price of gold.

Restoring an international gold standard would involve restoring convertibility to dollar claims of foreign governments and central banks, not to mention private institutions and individuals in foreign countries. Such claims could affect the monetary base and thus the money supply in the United States, regardless of payments flows.

If we assume that convertibility can be arranged without creating serious problems, countries would then be required to give up the discretion that they currently exercise in determining the level and growth rate of their domestic money supplies; under a gold standard, they must accept the effects on their money supply that changing gold reserves would dictate. This is the key issue raised by the proposal to return to the gold standard.

15.3.5 Adequacy of Gold Output

It is arguable that if velocity were to increase at a rate of 3 to 4 percent per year, as was true of the ratio of GNP to the sum of currency plus demand deposits from 1960 to 1980, and real output growth were to remain on average at 3 percent per year, a constant money supply would be optimal. No increase in the monetary gold stock to support a growing demand for money balances would be needed since the upward trend in velocity would accomplish an equivalent expansion

of the use of money in economic activity. Under such conditions, a return to the gold standard would involve no resource cost in mining gold for monetary use. An implicit stock resource cost, however, would still exist. Countries maintaining gold reserves could avoid this resource cost by selling their gold for nonmonetary use and putting the proceeds in earning assets.

If velocity failed to grow at a rate matching real income growth, returning to a gold standard would require a policy to assure adequate monetary growth. That would involve an adequate increase in the supply of gold. World gold reserves above and below ground may seem more than adequate when quoted in billions of ounces, but gold production responds sluggishly to changes in market price and since the 1960s has responded perversely. The trend of gold output, holding the real price of gold constant, has declined, generally 1 to 2 percent per year. Forecasts of gold output for the rest of the century in the market economies with known gold reserves are pessimistic. The inadequacy of the projected increase in supply might be offset by discovery of new mines or mining processes, changing patterns of industrial demand for gold, or shifts from current investment stocks. Reinstatement of the gold standard nevertheless poses a risk of long-run deflation of the economy. The political unrest in the United States during the deflation before 1896 was halted only by the upturn in prices when gold in ample quantities became available. Because of the change in social climate and the more activist role of government, a long and uncertain lag in the response of the gold supply to the changing demand for money would probably create greater problems today than in the nineteenth century.

The fact that the bulk of current world output of gold is from South Africa and the Soviet Union adds to the uncertainty of future gold supplies. Shocks in the gold market at home or abroad might also arise from changes in the demand for gold for investment and, on the supply side, from gold discoveries. Such shocks would make it difficult for one country alone to return to the gold standard because it would bear unilaterally the adjustment costs—inflation or deflation—imposed by the shocks.

15.3.6 Fixing Exchange Rates

The objective of a unilateral return to a gold standard by the United States would be to preserve flexible exchange rates and yet constrain domestic monetary growth by having a gold reserve requirement. Under such an arrangement, however, a shift from a foreign currency into gold by an American investor would impose the whole burden of adjustment on the exchange rate between the foreign currency and the dollar since the dollar price of gold would not change. A shift to gold

from the pound, for example, would tend to lower the price of the pound in terms of dollars. If there were significant portfolio shifts by Americans between foreign currencies and gold, exchange rates would tend (all other things equal) to become more variable than they are under the present floating system. A major question is how such gold transactions (or possible purchases or sales of gold by other countries) would affect domestic monetary policy.

If all industrial countries returned to the gold standard, each country would adopt par rates of exchange for its currency relative to the dollar or other currencies. Under the pre-1914 gold standard, the official rate of exchange expressed an equilibrium that had gradually evolved among national price levels. At the present time, par rates of exchange would have to be arbitrarily chosen. The mistakes made in the choice of exchange rates when European countries resumed the gold standard in the 1920s and again under the Bretton Woods arrangements are not reassuring.

In 1925, for example, Great Britain returned to the gold standard at an unrealistically high gold price for the pound. In 1947, it repeated that mistake. In the first attempt, it struggled for six years in a vain attempt to deflate the economy to make the gold price viable in the face of gold outflows. The pound was then freed to float. In the second attempt, after two years the pound was devalued. In 1928, France returned to the gold standard at an unrealistically low gold price for the franc. Gold inflows into France (and U.S. sterilization of its gold inflow) destabilized the system.

A multilateral return to the gold standard would require international agreement and amendment of the International Monetary Fund rules. Yet there is no evidence that other countries are interested in reinstating the gold standard. The views they have expressed, in fact, are negative with respect to the desirability or feasibility of a return to the gold standard.

15.4 Summary

The historical gold standard before 1914 was a monetary regime in which there was a commitment by governments to buy and sell gold at a fixed price; there were fixed gold requirements for the issue of national currencies that were convertible into gold. Governments were restrained from issuing unlimited amounts of their national currencies by the obligation to pay gold on demand. Fixed exchange rates between different national currencies, each linked to gold, united countries in an international system.

These features of the gold standard were not set in concrete. They varied over space and time, particularly after 1914. Some central banks

substituted for gold holdings interest-earning assets denominated in other national currencies and did not invariably respond promptly to increases or decreases in reserves by expanding or contracting the domestic money supply. Progressively, convertibility of nongold money into gold coin was withdrawn and replaced by convertibility into much heavier minimum weight units of gold bars, a right that was in turn withdrawn from domestic moneyholders and restricted to official institutions. The gold restraint on national money issues was ended with the abandonment of gold reserve requirements. The link was broken between alterations of a country's domestic money supply and deficits or surpluses in its international payments account. Fixed exchange rates under the Bretton Woods system evolved into adjustable pegged exchange rates. The system collapsed in the early 1970s, when confidence eroded in the gold convertibility of the U.S. dollar, the dominant reserve currency. Thereafter no significant role for gold remained in domestic and international monetary systems.

How satisfactory was the historical gold standard as a monetary regime? The key virtue that advocates claim for the gold standard is that it provided price stability. Yet price movements before World War I and during the interwar period were characterized by short-term variability and trends. The main benefit of the gold standard was long-term price predictability. Market participants undertook long-term contracts acting on the tendency for the price level ultimately to revert to its initial level. Although output growth was not smooth under the gold standard, cyclical changes may have reflected instability in money growth associated with the peculiarities of the U.S. banking system rather than with the character of the gold standard.

However, to the extent that cyclical changes occurred because of foreign monetary and nonmonetary disturbances that were transmitted by fixed exchange rates, fluctuations in output indeed were related to the monetary regime. Maintaining the gold standard also imposed resource costs on the economy. The stock of monetary gold could have been used for nonmonetary purposes and so deprived the economy of the yield from that alternative use. Furthermore, the costs of mining additions to the monetary gold stock to match increases in demand must be taken into account. Resource costs are acceptable to gold standard advocates but not to its detractors. Finally, although a fully functioning gold standard would be free of political intervention, increasingly governments and monetary authorities intervened to avoid the discipline the gold standard was designed to achieve.

Having given up the discipline of the gold standard, the world turned to a discretionary fiat money regime with managed flexible exchange rates. The record under the present regime has been one of high and variable inflation and interest rates, low productivity growth, and un-

stable foreign exchange rates, so the subject has been opened up of returning to the gold standard as a way of improving the record. Is it currently feasible to restore the gold standard regime? Serious technical problems would be encountered in an attempt to restore the gold standard. These include choosing the right price of gold, deciding what to do with the profits of gold devaluation, arranging for the pegging of the new gold price, linking the domestic money supply to gold reserves, assuring the adequacy of gold output, and fixing sustainable foreign exchange rates. These are technical issues. The solution to the difficulties each of these requirements poses would still not guarantee that the restored gold standard would provide a viable monetary regime. For that outcome, more than the solution of technical difficulties is required. Essentially, there must be precommitment by governments and their constituencies to the gold standard.

The gold standard can survive in a world in which countries allow gold to move freely; gold does not accumulate in any country, and gold does not drain away from any country without being allowed to exercise an expansionary or contractionary effect, respectively, on the level of prices; major disequilibria in price levels and financial conditions among countries are not endured. The forces that caused the breakdown of the Bretton Woods system were unleashed by actions of countries with a persistent deficit or surplus in their balance of payments. Those actions were taken to delay or resist changes in prices and costs expressed in national currencies. Under fixed exchange rates, convergence of national economic policies is essential for the system to be viable. The European Monetary System presupposes such behavior. Yet since 1979, when the system was established, member countries have repeatedly preferred to alter the relation between national price and cost levels by exchange-rate changes. This is not a good augury for restoration of an international gold standard.

Under the pre-World War I gold standard, governments in peacetime did not undertake expenditures that were financed by the printing press. (The gold standard collapsed when countries were engulfed by war or revolution.) In some gold standard countries, government was not divorced from business, and social insurance was accepted policy. Government participation in economic activity, however, was restrained by concern to preserve the integrity of the national currency and to maintain its domestic and external value. These concerns receded after 1929 as governments extended their activities to finance stabilization policies in response to interest groups wielding political influence.

The question then arises whether governments will reverse their course, returning to a more limited role, as in the pre-World War I era.¹ Of course, a limited role of the state is not in itself a guarantee of a viable international monetary system since in earlier eras inter-

national monetary affairs were often in disarray, even with limited states (Dam 1982, p. 38). The fundamental hurdle to a successful return to the gold standard is the resistance of political authorities and of modern democracies to precommitment and to forswearing of discretion. That hurdle is also a problem for a fiat money regime governed by a rule.²

The gold standard flourished before World War I possibly because of the special position of sterling and London. That position was threatened even before World War I when Paris and Berlin became important rivals of London. Thereafter, London's predominance was never re-established. Under the Bretton Woods system, the dollar and the United States were in a special position. As the convertibility of the U.S. dollar into gold crumbled, the system collapsed. An important aspect of the successful operation of a gold-centered monetary system is an unshakable confidence that the reserve currency of a dominant country will always be converted into gold on demand. What country is willing to be the candidate for such a role in a future gold standard? The failure of the U.S. Gold Commission in 1982 to endorse a larger, if not central, role for gold in monetary arrangements bespeaks the absence of the necessary commitment to adherence to gold standard rules in the United States.

Notes

1. Schumpeter's (1950, p. 451) verdict, referring to post-World War I developments, was that "no return to prewar policies proved possible even where it was attempted. This has been strikingly verified by England's gold policy and its ultimate failure. In a world that was no longer the world of free enterprise, the gold standard—the naughty child that keeps on telling unpleasant truths—ceased to work."

2. Compare this conclusion with that in the recent study of the gold standard by Flood and Garber (1984, p. 90): "Even a well-designed commodity money scheme is a foolproof inflation guard only when the scheme's permanence is guaranteed. Permanence may possibly be guaranteed by an underlying political economy that abhors inflation, but merely enactment of a new ephemeral rule does not ensure permanence."