The Classical Gold Standard: Some Lessons for Today

MICHAEL DAVID BORDO

THE widespread dissatisfaction with almost two decades of worldwide inflation has prompted interest in a return to some form of a gold standard. Some crucial questions must be answered, however, before such interest can be taken seriously. Two questions immediately come to mind: How did the actual gold standard operate? What was its record for providing stable prices and overall economic stability?

This article attempts to answer these two questions. It focuses primarily on what is commonly referred to as the "Classical Gold Standard," which prevailed in its most pristine form between 1880 and 1914.2

The first section discusses some fundamentals of the gold standard. This is followed by a discussion of the "Managed Gold Standard" which characterized much of the pre-World War I period. Following that is a brief narration of the history of the gold standard. Next, some empirical evidence is presented on the performance of the economies of the United States and the United Kingdom under the gold standard. Finally, the case for a return to the gold standard is examined.

The evidence presented in this article suggests that, in several respects, economic performance in the United States and the United Kingdom was superior under the classical gold standard to that of the subsequent period of managed fiduciary money.3 In particular, both the price level and real economic activity were more stable in the pre-World War I gold standard era than in the subsequent six-and-one-half decades. Much of the relatively poor performance of the post-World War I period, however, occurred in the interwar period, a period characterized by deflation, real output instability and high unemployment.

WHAT WAS THE GOLD STANDARD?

The gold standard essentially was a commitment by participating countries to fix the prices of their domestic currencies in terms of a specified amount of gold. The countries maintained these fixed prices by being willing to buy or sell gold to anyone at that price. Thus, for example, from 1821 to 1914, Great Britain maintained a fixed price of gold at £3, 17s, 10 1/2d; the United States, over the 1834-1933 period, maintained the price of gold at $20.67 per ounce (with the exception of the Greenback era from 1861 to 1878).

WHY GOLD?

Gold has the desirable properties of money that early writers in economics have stressed. It is durable, easily recognizable, storable, portable, divisible and easily standardized. Especially important, changes in its stock are limited, at least in the short run, by high costs of production, making it costly for governments to 1878, and has been on one since 1971. Under such a standard, monetary authorities have complete control over the domestic money supply. An alternative situation, often characterized as "managed" money, occurs when monetary authorities, though committed to maintaining a fixed price of gold, engage in a systematic policy of sterilizing (or neutralizing) the influence of gold flows on the domestic money supply by using offsetting open market operations. Although the United States was still on the gold standard, the period from 1914 to 1933 in U.S. monetary history can thus be viewed as a period of "managed" money because of the frequent sterilizing activity of the Federal Reserve System. See Milton Friedman and Anna Jacobson Schwartz, A Monetary History of the United States 1867-1960 (Princeton University Press, 1963).
to manipulate. Because of these physical attributes, it emerged as one of the earliest forms of money.

More important, gold was a commodity money, and a commodity money standard, regardless of the commodity involved, has a very desirable property: it ensures through the operation of the competitive market a tendency toward long-run price stability. Under a commodity money standard, the purchasing power of a unit of commodity money, or what it will buy in terms of all other goods and services, will always tend toward equality with its long-run cost of production.

The Gold Standard and a Closed Economy

Consider first the example of a closed economy — one that does not trade with any other country — that produces gold and uses only gold coins as money. In this country, the government is committed to purchase gold from the public on demand at a fixed price and to convert it into gold coin. Similarly, the government will sell gold to the public at the fixed price. The price level (the average of the prices of all goods and services produced in the country) will be determined by the equality of the quantity of gold coins demanded and supplied.

The supply of gold coins is determined by the supply of gold in the economy and by the amount of gold used for nonmonetary purposes. The supply of gold in the long run is determined by the opportunity cost of producing gold — the cost in terms of foregone labor, capital and other factors engaged in producing an additional unit of gold. The fraction of gold devoted to nonmonetary uses is determined by the purchasing power of gold in terms of all other commodities. The demand for gold coins is determined by the community's wealth, tastes and the opportunity cost of holding money relative to other assets (the interest rate).

In the long run, competition in the gold-producing industry ensures that the purchasing power of gold money in terms of all other goods will equal the opportunity cost of producing an additional unit of gold money.

To see how this works, consider what happens when a technological advance improves productivity in the non-gold-producing sectors of the economy. This improvement leads to a rise in real economic activity, an increase in the demand for money (gold coins) and, with an initially given stock of money, a fall in the price level (a rise in the purchasing power of gold money). The fall in the price level means that gold producers will be earning economic profits. These profits will encourage existing owners to increase production and new entrepreneurs to enter the industry, resulting in an increase in gold production.

At the same time, people will take gold previously used for nonmonetary purposes and convert it to monetary uses (e.g., they will sell gold jewelry to the government and have it coined). These forces will increase the gold coin supply, reversing the initial decline in the price level.

In a similar manner, increases in the price level, caused, for example, by a gold discovery which increases the stock of gold and the supply of gold coins, will, by reducing the purchasing power of gold money, cause the community to shift gold from monetary to nonmonetary uses, and will eventually reduce production in the gold-producing industries. Both factors will tend to reduce the gold money supply and reverse the initial rise in the price level. Thus, under a gold standard, one would expect to observe long-run price level stability, though it may take several years for a declining or rising price level to be reversed.

The Gold Standard and Open Economies

If, instead of a closed economy, we have a world in which a number of countries are on a gold coin

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4Of course, in earlier times, governments have moved gold by debasement, clipping, etc. Such practices, however, were the exception. See Anna J. Schwartz, "Secular Price Change in Historical Perspective," Journal of Money, Credit and Banking (February 1973, Part 2), pp. 243-69.

5For a lucid discussion of the theory of commodity money, see Milton Friedman, "Commodity-Reserve Currency" in Milton Friedman, Essays in Positive Economics (University of Chicago Press, 1953).

6In actuality the buying and selling prices will differ, reflecting the cost of certifying and minting coins. This difference is referred to as brassage.

7Monthly and annual price levels are determined by the concept of the price level is made up of the price level of all goods and services produced in the country, which, in turn, is determined by the equality of the quantity of gold coins demanded and supplied.

8In addition, exploration for new sources of gold and attempts to more efficiently mine existing sources will result.

9Also, rising prices will be accompanied by rising wages and other costs, making gold mining a less profitable activity. This analysis assumes constant costs; with increasing costs the purchasing power of gold will be lower and the price level will fall.

10This analysis is static. In a dynamic context, growing real output will produce a tendency towards secular deflation unless gold output expands at the same rate as real economic activity. This will happen if the rate of technological advance is the same in the gold-producing sectors of the economy as in the rest of the economy or if the opening of new mines proceeds at the same rate as real growth. In a world characterized by purely stochastic events such as major gold discoveries, the price level will diverge from its long-run trend for a very long time, giving the appearance of long-run price instability. However, to the extent that gold discoveries are not random events but occur in response to rises in the purchasing power of gold, these extended periods of inflation and deflation are part of the equilibrating process of a commodity standard.

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standard, a mechanism is introduced that ensures uniform price movements across these countries.

Consider, for example, two countries that were on the gold standard, the United States and the United Kingdom. As mentioned above, each country fixed the price of its currency in terms of gold—the United States fixed the price of one ounce of gold at $20.67, while the United Kingdom set it at £3, 17s, 10 1/2d. Thus, the dollar/pound exchange rate was perfectly determined. The fixed exchange rate of $4.867 per pound was referred to as the par exchange rate.10

Under the gold standard fixed exchange rate system, disturbances in the price level in one country would be wholly or in part offset by an automatic balance-of-payments adjustment mechanism called the price-specie-flow mechanism. Consider again the example where a technical advance in the United States lowers the U.S. price level. The fall in U.S. prices will result in lower prices of U.S. exports, which will decline relative to the prices of imports, determined largely by prices in the rest of the world. This change in terms of trade (the ratio of export prices to import prices) will cause foreigners to demand more U.S. exports, and U.S. residents to demand fewer imports. A U.S. balance-of-payments surplus will be created, causing gold to flow into the United States from the United Kingdom.11 The gold inflow will increase the U.S. money supply, reversing the initial fall in prices. At the same time, in the United Kingdom, the gold outflow will reduce the U.K. money supply, thus reducing its price level. In final equilibrium, price levels in both countries will be somewhat lower than they were prior to the technical advance in the United States. Thus, the operation of the price-specie-flow mechanism served to keep prices in line across the world.12

In sum, the gold standard as a commodity money standard provided a mechanism to ensure long-run price level stability both for individual countries and groups of countries. Each country had only to maintain a fixed price of gold.

THE MANAGED GOLD STANDARD

The simple model of the gold standard just described was seldom followed in practice. The pure gold coin standard had two features that caused most countries to modify its operation: (1) very high resource costs were required to maintain a full commodity money standard and (2) strict adherence to the “iron discipline” of the gold standard required each country to subsume its internal balance (domestic price and real output stability) to its external balance (balance-of-payments equilibrium). Thus, if a country was running a balance-of-payments deficit, the “rules of the game” required it to deflate the economy until “purchasing power parity” was restored at the par exchange rate.13 Such deflation leads to a reduction in real output and employment. Consequently, a meaningful discussion of how the gold standard actually operated before World War I requires a discussion of the ways in which nations modified the gold standard to economize on gold and to shield domestic economic activity from external disturbances.

The Use of Fiduciary Money

As mentioned above, high resource costs are required to maintain a full commodity money standard. Discovering, mining and minting gold are costly activities.14 Consequently, as nations developed, they evolved substitutes for pure commodity money. These substitutes encompassed both government-provided paper money (referred to as fiat money) and privately

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10 The U.K. definition of an ounce of gold was 11/12 of the U.S. definition. Actually, under the gold standard, the exchange rate was never exactly fixed. It varied within a range bounded by the gold points—the costs of transporting gold between the United States and the United Kingdom. Thus, if Americans reduced their demand for British goods and hence for pounds to pay for them, the dollar price of the pound would decline. When the dollar price of the pound declined to, say, $4.80, it would pay to melt down English gold sovereigns into bullion, ship the bullion to the United States, and convert it into U.S. gold coins.

11 In this simple example, the increased British demand for U.S. goods lowers the pound to the gold export point. As a consequence, British importers convert pounds into bullion and ship them to the United States, converting them to U.S. gold dollars to pay for American goods.

12 An alternative to the balance-of-payments adjustment mechanism described above is called the Monetary Approach to the Balance of Payments. See Harry G. Johnson, “The Monetary Approach to Balance of Payments Theory” in Jacob A. Frenkel and Harry G. Johnson, eds., The Monetary Approach to the Balance of Payments (Allen and Unwin, 1976). According to this approach, through the process of arbitrage—the buying and selling of similar commodities in different markets—the prices of all internationally traded goods, exports, imports and close substitutes, will be the same around the world expressed in similar currency units. Moreover, the price of domestic goods and services (non-traded goods) will be kept in line with prices of internationally traded goods by domestic arbitrage. Hence, instead of U.S. prices falling first in response to an excess demand for money, and the terms of trade subsequently changing, the excess demand for money will be satisfied directly by the import of gold (through a balance-of-payments surplus) without change in the terms of trade.

13 Purchasing power parity is the ratio of the domestic country’s price level (value of money) to that of its principal trading partners.

14 Friedman estimated the cost of maintaining a full gold coin standard for the United States in 1960 to be more than 2 1/2 percent of GNP. See Milton Friedman, A Program for Monetary Stability (Fordham University Press, 1959).
produced fiduciary money (bank notes and bank deposits). As long as governments maintained a fixed ratio of their notes to gold, and commercial banks kept a fixed ratio of their liabilities to gold (or to government notes and gold), a gold standard could still be sustained. This type of standard prevailed throughout the world before World War I.

One aspect of this "mixed" gold standard system was that one unit of a country's gold reserves could support a multiple number of units of domestic money (e.g., the U.S. ratio of money to the monetary gold stock was 8.5 in the 1880-1913 period). This meant that in the short run gold flows had powerful effects on the domestic money supply, spending and prices.\[18\]

**International Capital Flows**

So far, the discussion abstracts from the role of capital flows between countries. In the pre-World War I gold standard era, most international trade was financed by credit, the issuing of short-term claims in the London money market.\[16\] In addition, economic projects in the less-developed economies were generally financed by long-term loans from investors in England, France and other advanced countries.\[17\] The influence of these capital flows significantly reduced the burden of gold flows in the adjustment mechanism.

Consider the example of a gold discovery in a particular country. The discovery would lead to a rise in the domestic money supply, which both raises domestic price levels and reduces domestic interest rates in the short run.\[18\] The reduction in domestic interest rates relative to interest rates in other countries would induce investors to shift their funds to foreign money markets. This produces a gold outflow, thereby reducing the amount of adjustment required through changes in the terms of trade. Also, to the extent that short-term capital serves as a substitute for gold as an international reserve asset, and domestic financial intermediaries hold balances with correspondents abroad, smaller gold flows would be required to settle international payments imbalances.

Finally, consider the role of long-term capital movements. In the pre-World War I era, the real rate of return on capital was higher in developing countries such as the United States, Canada and Australia than in European countries such as the United Kingdom and France. As a consequence, British investors, for example, invested heavily in American industries and utilities by purchasing long-term securities. The demand by British investors for American securities (other things equal) created an excess demand for dollars at the par exchange rate (or equivalently an excess supply of pounds). The resulting gold inflow into the United States raised the U.S. money supply, leading to a rise in the U.S. price level. The resultant rise in export prices relative to import prices led to an increased demand by U.S. residents for imports (primarily manufactured goods from the United Kingdom). Thus, the transfer of capital resulted in a transfer of real resources from the United Kingdom to the United States. Indeed, in the pre-World War I era, it was normal for a developing country such as the United States to run a persistent balance-of-payments deficit on current account (imports of goods and services exceeding exports of goods and services), financed primarily by long-term capital inflows.

**The Role of Central Banks in the Gold Standard**

Under a strict gold standard, there is no need for a central bank. What is required is a governmental authority to maintain the fixed domestic currency price of gold by buying and selling gold freely.\[19\] Indeed, many countries on the gold standard prior to World War I (e.g., the United States and Canada) did not have central banks. Most European countries, on the other hand, have had central banks that predated the gold standard. These institutions, in most cases, had evolved from large commercial banks that served as bankers to the government (e.g., the Bank of England, founded in 1697) into institutions serving as lenders of last resort to the banking community.

Under the classical gold standard, central banks were supposed to follow the rules of the game—to speed up the adjustment of the domestic money supply and price level to external gold flows. The classical model of central bank behavior was the Bank of England, which played by the rules over much of the

\[18\] It also meant that changes in the composition of the money supply between high-powered money (gold coins and government paper) and bank-provided money (notes and deposits) could be a source of monetary instability.


\[18\] This is the so-called liquidity effect. To induce the community to hold a larger fraction of its wealth in the form of money rather than interest-bearing securities, the price of securities must rise (the interest rate must fall).

\[19\] However, a substantial gold reserve is required to do this effectively.
1870-1914 period.20 Whenever Great Britain faced a balance-of-payments deficit and the Bank of England saw its gold reserves declining, it raised “bank rate,” the rate of interest at which it was willing to discount money market paper. By causing other interest rates to rise, the rise in bank rate was supposed to produce a reduction in holdings of inventories and a curtailment of other investment expenditures. The reduction in investment expenditures would then lead to a reduction in overall domestic spending and a fall in the price level. At the same time, the rise in bank rate would stem any short-term capital outflow and attract short-term funds from abroad.

For most other countries on the gold standard, there is evidence that interest rates were never allowed to rise enough to contract the domestic price level—that these countries did not follow the rules of the game.21 Also, many countries frequently followed policies of sterilizing gold flows—attempting to neutralize the effects of gold flows on the domestic money supply by open market purchases or sales of domestic securities.22

Reserve Currencies and the Role of Sterling

An important addition to the gold standard story is the role of key currencies.23 Many countries under the pre-World War I gold standard held their international reserves in gold and in the currencies of several major countries. The center of the international payments mechanism was England, with the Bank of England maintaining its international reserves primarily in gold. Most other countries kept reserves in the form of gold and sterling assets. Between 1900 and 1914, two other major European capitals also served as reserve centers—Paris and Berlin, each of which held reserves in gold, sterling and the other country’s currency. Finally, a number of smaller European countries held reserves in the form of francs and marks.

In addition, an elaborate network of short-term financial arrangements developed between private financial institutions centered in the London money market. This network of reserve currencies and short-term international finance had two important results. First, England (the Bank of England) could act as an umpire (or manager) of the world gold standard system without having to hold excessive gold reserves.24 By altering its bank rate, the Bank of England caused repercussions around the world.25

Second, much of the balance-of-payments adjustment mechanism in the pre-World War I period did not require actual gold flows. Instead, the adjustment consisted primarily of transfers of sterling and other currency balances in the London, Paris, Berlin and New York money markets.26 In addition, short-term capital flows accommodated the balance-of-payments adjustment mechanism in this period.27 Indeed, the pre-World War I gold standard has often been described as a sterling standard.28

In sum, the gold standard that emerged before World War I was very different from the pure gold coin standard outlined earlier. Unlike the pure gold coin standard, countries economized on the use of gold both in their domestic money supplies and as a means of settling international payments imbalances. In addition, to avoid the iron discipline of the gold standard, central banks in some countries did not follow the rules of the game, and some countries even

20However, most other central banks apparently did not. See Arthur I. Bloomfield, Monetary Policy under the International Gold Standard: 1880-1914 (Federal Reserve Bank of New York, 1959).
22Usually, gold outflows were offset by open market purchases of domestic securities. For the U.S. experience, see Friedman and Schwartz, A Monetary History of the United States. For other countries see Bloomfield, Monetary Policy under the International Gold Standard. Such behavior could not persist, however, if a country wished to maintain its link with gold, because if the disequilibrium producing the gold flow were permanent (e.g., the domestic price level were higher than world prices), then gold outflows would continue until all of the country’s gold reserves were exhausted. (In the case of an inflow, it would continue until the monetary base consisted entirely of gold.)
23Much of this discussion derives from Peter H. Lindert, Key Currencies and Gold, 1900-1913, Princeton Studies in International Finance No. 24 (Princeton University, 1969).
25It likely caused monetary crises in the United States in the 1838-43 period and 1873. See Peter Temin, The Jacksonian Economy (W. W. Norton, 1969) and Friedman and Schwartz, A Monetary History of the United States.
26Also in the period after 1900, instead of gold actually being transported between centers, the practice of “earmarking” gold holdings in major centers gained importance.
27See Bloomfield, Short-Term Capital Movements.
abandoned the gold standard periodically. The final modification to the pure gold standard was the key role played by the Bank of England as umpire to the system. The result was a “managed gold standard,” not the pure gold coin standard often extolled as the best example of a commodity money system.

**CHRONOLOGY OF THE GOLD STANDARD: 1821-1971**

This section briefly sketches the chronology of the gold standard from the end of the Napoleonic Wars to the collapse of Bretton Woods.

**The Classical Gold Standard: 1821-1914**

In the 18th century, England and most other countries were on a bimetallic standard based primarily on silver. When Great Britain restored specie payments in 1821 after the Napoleonic War inflation episode, the gold standard was restored. From 1821 to 1880, the gold standard steadily expanded as more and more countries ceased using silver. By 1880, the majority of countries in the world were on some form of a gold standard.

The period from 1880 to 1914, known as the heyday of the gold standard, was a remarkable period in world economic history. It was characterized by rapid economic growth, the free flow of labor and capital across political borders, virtually free trade and, in general, world peace. These external conditions, coupled with the elaborate financial network centered in London and the role of the Bank of England as umpire to the system, are believed to be the *sine qua non* of the effective operation of the gold standard.

**The Gold Exchange Standard: 1925-31**

The gold standard broke down during World War I, succeeded by a period of “managed fiduciary money,” and was briefly reinstated from 1925 to 1931 as the Gold Exchange Standard. Under the Gold Exchange Standard, countries could hold both gold and dollars or pounds as reserves, except for the United States and the United Kingdom, which held reserves only in gold. In addition, most countries engaged in active sterilization policies to protect their domestic money supplies from gold flows.

The Gold Exchange Standard broke down in 1931 following Britain’s departure from gold in the face of massive gold and capital flows and was again succeeded by managed fiduciary money.

**The Bretton Woods System: 1946-71**

The Bretton Woods System was an attempt to return to a modified gold standard using the U.S. dollar as the world’s key reserve currency. All other countries—except for the sterling bloc—settled their international balances in dollars. The United States fixed the price of gold at $35.00 per ounce, maintained substantial gold reserves, and settled external accounts with gold bullion payments and receipts.

In the post-World War II period, persistent U.S. balance-of-payments deficits helped finance the recovery of world trade from the aftermath of depression and war. However, the steady growth in the use of U.S. dollars as international reserves and persistent U.S. deficits steadily reduced U.S. gold reserves and the gold reserve ratio, reducing public confidence in the ultimate ability of the United States to redeem its currency in gold. This “confidence problem” coupled with many nations’ aversion to paying both seigniorage and an “inflation tax” to the United States in the post-1965 period, led to the ultimate breakdown of the Bretton Woods system in 1971. The U.S. decision in 1971 to abandon pegging the price of gold was the final demise of the gold standard.

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30Under a bimetallic standard, each of two precious metals, gold and silver, serves as legal tender, and the two metals are kept in a fixed proportion to each other. The relationship between the official exchange rate of gold for silver and the market rate will determine whether one or both metals is used as money. For example, in 1834, the United States raised the mint ratio of silver to gold from 15:1 to 16:1, hence valuing silver slightly lower relative to gold than the world market. As a result, little silver was offered for coinage and the United States was in effect on the gold standard. See Leland B. Yeager, *International Monetary Relations: Theory, History and Policy*, 2nd ed. (Harper and Row, 1976), p. 296.

31The switch from silver to gold reflected both changes in the relative supplies of the two precious metals resulting from the gold discoveries of the 1840s and 1850s and a growing preference for the more precious metal as world real income rose.

32See Palyi, *The Twilight of Gold and Yeager, International Monetary Relations*.
THE RECORD OF THE GOLD STANDARD

This section briefly examines the stability of the price level and real output for the United Kingdom and the United States under both the gold and managed fiduciary money standards. Charts 1 and 2 portray the behavior of the wholesale price index from 1800 to 1979 for both countries.

From 1797 to 1821, during and immediately following the Napoleonic Wars, the United Kingdom was on a fiat (or paper) standard; it officially joined the gold standard in 1821, maintaining a fixed price of gold until 1914. There is little change in the U.K. price level comparing the first year of the gold standard, 1821, to the last, but over the whole period there was a slight downward trend in prices, declining on average by 0.4 percent per year. Within that approximate 100-year span, however, periods of declining prices alternated with periods of rising prices, a pattern consistent with the commodity theory of money. Prices fell until the mid-1840s, reflecting the pressure of rising real incomes on the limited stock of gold. Following the California and Australian gold discoveries of the late 1840s and early 1850s, prices turned around and kept rising until the late 1860s. This was followed by a 25-year period of declining prices, again reflecting both rising real income and expansion of the number of countries on the gold standard. This deflation ended after technical advances in gold processing and major gold discoveries in the late 1880s and 1890s increased world gold supplies.

The United States followed a pattern similar to the United Kingdom, experiencing a slight downward trend in the price level with prices declining on average by 0.14 percent per year from 1834-1913. The country adopted the gold standard in 1834 (it had been on silver for the preceding 35 years) and remained on it at the same price of gold until World War I, with the exception of the Greenback episode from 1861 to 1878.\textsuperscript{36} During that period, the country abandoned the gold standard and prices increased rapidly until 1866. To restore convertibility to gold, prices had to fall sufficiently to restore the pre-war purchasing power parity. This occurred in the rapid deflation from 1869 to 1879.

The period since World War I has not been charac-

\textsuperscript{36}Also to be excluded from the gold standard are the turbulent years 1838-1843, during which specie payments were generally suspended.
terized by price stability except for the 1920s under the Gold Exchange Standard, and the 1950s and early 1960s under the Bretton Woods System. Indeed, since the end of the gold standard, price levels in both countries have on average been rising. The U.K. price level increased at an average annual rate of 3.81 percent from 1914 to 1979, while U.S. price level increased by an average annual rate of 2.2 percent.

Charts 3 and 4 present further evidence on the operation of a commodity money standard and on the long-run price stabilizing character of the gold standard.

Chart 3 compares the purchasing power of gold for the world (measured by the ratio of an index of the price of gold to the wholesale price index for the United Kingdom) in relation to its trend with the world monetary gold stock in relation to its trend over the period 1821-1914. The purchasing power of gold index presented here varies inversely with the wholesale price index presented in chart 1. This inverse association is a reflection of the fixed price of gold over this period. The trends of both series were rising over the whole period. The upward trend in the purchasing power of gold series reflects a more rapid growth of world real output and, hence, in the demand for monetary gold than could be accommodated by growth in the world's monetary gold stock.

In comparing deviations from trend in the purchasing power of gold to that in the world monetary gold stock, one would expect that deviations from trend in the monetary gold stock would produce corresponding changes in the price level and, for a given nominal price of gold, would inversely affect the purchasing power of gold. A comparison reveals this negative association, with deviations from trend in the world monetary gold stock leading deviations from trend in the purchasing power of gold.

Indeed, this inverse relationship prevailed virtually until the late 1960s. Since the freeing of the price of gold in 1968, the purchasing power of gold has varied directly with the wholesale price index. This primarily reflects rising demand for gold as a hedge against inflation, and increasing world political and monetary instability.

The highest statistically significant negative correlation in the 1821-1914 period occurred with deviations from trend in the monetary gold stock leading deviations from trend in the purchasing power of gold by two years. The correlation coefficient, −.844, was statistically significant at the 1 percent level.

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28The United Kingdom was chosen to represent the pre-1914 world because it was a large open economy with few trade restrictions. Hence the wholesale price index would be dominated by internationally traded goods.

29The United States imposed gold export embargo from September 1917 to June 1918. The broken line indicates years excluded in computing trend.
In addition, according to the operation of a commodity money standard, movements in the purchasing power of gold would be expected to precede movements in the monetary gold stock—a rising purchasing power of gold would induce both a shift from nonmonetary to monetary uses of gold and increased gold production. Such a positive association between deviations from trend of the two series is observed. Thus the 1820s and '30s were largely characterized by the purchasing power of gold exceeding its long-run trend. This was followed by a rapid increase in the world monetary gold stock after 1848 as the output of the new California and Australian mines were added to the world’s stock. Subsequently, the purchasing power of gold declined from its peak above trend in the mid-1850s and was succeeded by a marked deceleration in the monetary gold stock after 1860. The same pattern can be observed comparing the rise in the purchasing power of gold in the 1870s and '80s with the subsequent increase in the monetary gold stock in the mid-1890s.

Chart 4 compares the U.S. purchasing power of gold in relation to its trend with the U.S. monetary gold stock in relation to its trend over the 1879-1914 gold standard period. In this period, the trends of the two series moved in opposite directions. The declining trend in the purchasing power of gold series, reflecting more rapid growth in the U.S. monetary gold stock than in real output, was a consequence of two developments: the accumulation of monetary gold from the rest of the world early in the period following the resumption of specie payments, and the effects of gold discoveries in the 1890s.

As in chart 3, a negative association between deviations from trend in the monetary gold stock and

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The highest statistically significant positive correlation in the 1821-1914 period occurred with deviations from trend in the purchasing power of gold leading deviations from trend in the world monetary gold stock by 25 years. The correlation was .436, statistically significant at the 1 percent level.

41An important difference in comparing the behavior of the U.S. monetary gold stock with that of the world is that short-run movements in the U.S. series would reflect, in addition to changes in gold production and shifts between monetary and nonmonetary uses of gold, gold movements between the United States and other countries.
the purchasing power of gold is observed. Also, similar to the evidence in chart 3, deviations in trend in the purchasing power of gold preceded deviations from trend in the monetary gold stock with a lead. Thus, declines in the purchasing power of gold from 1879 to 1882 preceded declines in the monetary gold stock below trend in the late 1880s and early 1890s, while rises in the purchasing power of gold after 1882 can be associated with a rising monetary gold stock after 1896. Finally, a declining purchasing power of gold in the mid-1890s can be associated with a falling monetary gold stock after 1903.

The highest statistically significant negative correlation in the 1879-1914 period occurred with a contemporaneous relationship between deviations from trend in the monetary gold stock and deviations from trend in the purchasing power of gold. The correlation coefficient, —.656, was statistically significant at the 1 percent level.

The highest statistically significant positive correlation in the 1879-1914 period occurred with deviations from trend in the purchasing power of gold leading deviations from trend in the monetary gold stock by 14 years. The correlation coefficient was .795, which was statistically significant at the 1 percent level.

The highest statistically significant positive correlation in the 1879-1914 period occurred with deviations from trend in the world purchasing power of gold leading deviations from trend in the world monetary gold stock by 16 years. The correlation coefficient was .863, which was statistically significant at the 1 percent level. The considerably longer lead observed over the 1821-1914 period in footnote 40 above likely reflects a longer adjustment period in the early part of the 19th century.

One important implication of the tendency for price levels to revert toward a long-run stable value under the gold standard was that it insured a measure of predictability with respect to the value of money: though prices would rise or fall for a few years, inflation or deflation would not persist. Such belief in long-run price stability would encourage economic agents to engage in contracts with the expectation significant at the 1 percent level. The evidence that positive (negative) autocorrelations of the price level are succeeded by negative (positive) autocorrelations is consistent with the hypothesis that the price level reverts back to its mean level. A consequence of this mean reversion phenomenon was that year-to-year changes in the price level were substantial for each country. However, the standard deviations of year-to-year changes in the wholesale price index were still considerably lower in the pre-World War I gold standard era compared with the post-World War I managed fiduciary money era. For the United Kingdom, the standard deviations were: 1821-1913, 6.20; 1919-79 (excluding 1939-45), 12.00. For the United States, the standard deviations were: 1834-1913 (excluding 1839-43 and 1861-78), 6.29; 1919-79 (excluding 1941-45), 9.28.
that, should prices of commodities or factors of production change, the change would reflect real forces rather than changes in the value of money.

Belief in long-term price level stability has apparently disappeared in recent years, as people now realize that the long-run constraint of the gold standard has vanished. As a consequence, it is more difficult for people to distinguish between changes in relative prices and changes in the price level. Such absolute vs. relative price confusion has increased the possibility of major economic losses as people fail to respond to market signals.

Finally, evidence on real output stability for the United Kingdom and the United States is presented. It is frequently argued that under the gold standard, when countries had to subordinate internal balance considerations to the gold standard’s iron discipline, real output would be less stable than under a regime of managed fiduciary money. Charts 5 and 6 show the deviations of real per capita income from its long-run trend over the period 1870 to 1979.

For the United Kingdom, chart 5 shows both a single trend line for the 1870-1979 period and separate trend lines for each of the pre- and post-World War I subperiods. The U.K. data was split into two subperiods because the trend line for the entire period results in real output after 1919 being virtually always below trend. This suggests that World War I permanently altered the trend growth rate of real per capita income in the United Kingdom and, hence, the two periods should be handled separately. Examining the deviations from trend (using the subperiod trends) suggests that real per capita income was less variable in the pre-World War I period than subsequently. The mean absolute value of the percentage deviations of real per capita income from trend was 2.14 percent from 1870-1913 and 3.75 percent from 1919-79 (excluding 1939-45).

As in the U.K. case, U.S. real per capita income was more stable under the gold standard from 1879 to 1913 compared with the entire post-World War I
The mean absolute values of the percentage deviations of real per capita income from trend were: 6.64 percent from 1879-1913 and 8.97 percent from 1919-79 (excluding 1941-45).

Moreover, unemployment was on average lower in the pre-1914 period in both countries than in the post-World War I period. For the United Kingdom, the average unemployment rate over the 1888-1913 period was 4.30 percent, while over the period 1919-79 (excluding 1939-45) it was 6.52 percent. For the United States, average unemployment rates by sub-period were: 1890-1913, 6.78 percent and 1919-79 (excluding 1941-45), 7.46 percent.

Thus, the evidence suggests that the managed fiduciary money system superceding the gold standard generally has been associated with less real economic stability.

THE CASE FOR A RETURN TO GOLD

The pre-World War I gold standard was the closest thing to a worldwide commodity money standard. Hence, an examination of the record for that period is crucial in determining what we might expect should we return to some form of commodity standard.

One dominant feature of that period was long-run price stability. This contrasts favorably with the behavior of the price level under the managed fiduciary money standard for much of the period since World War I. Also, though real output varied considerably from year to year under the gold standard, it did not vary discernibly more than it has in the entire period since the first world war.\(^\text{47}\)

One problem with comparing the pre-World War I gold standard to the managed fiduciary money standard after World War I is that the latter period includes the turbulent interwar years, a period that may bias the case against managed fiduciary money. To account for this, table 1 compares several measures of performance of the price level, real output and money growth for three time periods: the pre-World War I

\(^\text{47}\)The standard deviations of year-to-year percentage changes in real per capita income for the United States were: 1879-1913, 5.79; 1919-79 (excluding 1941-45), 6.34. For the United Kingdom: 1870-1913, 2.62; 1919-79 (excluding 1939-45), 3.24.
Table 1
A Comparison of the Behavior of Price Level, Real Output and Money Growth in the United Kingdom and the United States

<table>
<thead>
<tr>
<th></th>
<th>The Gold Standard</th>
<th>The Interwar Period</th>
<th>Post-World War II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1870-1913</td>
<td>1879-1913</td>
<td>1919-38</td>
</tr>
<tr>
<td>(1) The average annual percentage change in the price level</td>
<td>-0.7% (0.4)</td>
<td>0.1% (-0.1)</td>
<td>-4.6%</td>
</tr>
<tr>
<td>(2) The coefficient of variation of annual percentage changes in the price level (ratio)</td>
<td>-14.9 (-16.3)</td>
<td>17.0 (6.5)</td>
<td>8.8</td>
</tr>
<tr>
<td>(3) The coefficient of variation of annual percentage changes in real per capita income (ratio)</td>
<td>2.5</td>
<td>3.6</td>
<td>4.9</td>
</tr>
<tr>
<td>(4) The average level of the unemployment rate</td>
<td>4.3%</td>
<td>6.5%</td>
<td>13.3%</td>
</tr>
<tr>
<td>(5) The average annual percentage change in the money supply</td>
<td>1.5%</td>
<td>6.1%</td>
<td>0.9%</td>
</tr>
<tr>
<td>(6) The coefficient of variation of annual percentage changes in the money supply (ratio)</td>
<td>1.6</td>
<td>0.8</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Notes: Rows 1 and 5 calculated as the time coefficient from a regression of the log of the variable on a time trend. Rows 2, 3 and 6 calculated as the ratio of the standard deviation of annual percentage changes to their mean.

1Data for the longer periods (in parentheses) were available only for the price level. Years 1835-43 and 1861-78 were excluded for the United States.
21886-1913
31890-1913
Data Sources: See data appendix

First, row 1 presents evidence on long-run price level stability as measured by the average annual rate of change in the price level over the period. As can be observed, the interwar period in both countries was characterized by substantial deflation in both the gold standard period, the interwar period and the post-World War II period.48

Second, row 3 presents evidence on real output stability as measured by the coefficient of variation of year-to-year percentage changes in real per capita output. Real output was considerably less stable in both countries in the interwar period than in either the gold standard or the post-World War II period.
with the latter period having the best record. In addition, the evidence on average unemployment rates in row 4 agrees with the evidence on real output stability: unemployment was by far the highest in the interwar period and by far the lowest in the post-World War II period in both countries.49

Finally, a comparison is made across periods in the average annual rate of monetary growth in row 5, and in the variability in monetary growth measured by the coefficient of variation of percentage year-to-year changes in the money supply in row 6. According to monetary theory, a reduction in monetary growth below the long-run trend of real output growth will produce deflation, while a rise in monetary growth above the long-run trend of real output growth will lead to inflation. In the transition between different rates of monetary growth, both the levels and growth rates of real output will deviate considerably from long-run trend. Thus monetary variability will lead to real output variability.50

The rate of monetary growth was lower in both countries in the interwar period than in both the post-World War II and the gold standard periods. In the case of the United Kingdom, the post-World War II period exhibits more rapid monetary growth than under the gold standard, while for the United States, monetary growth rates are similar in both the post-war and gold standard periods.

Finally, monetary growth was more variable in both countries in the interwar period than in the other two periods, with the post-World War II period displaying the least variability in monetary growth.

The poor economic performance of the interwar period compared with either the preceding gold standard period or the post-World War II period has been attributed to the failure of monetary policy. Indeed, the attempt by the Bank of England to restore convertibility to gold at the pre-war parity has often been characterized as the reason for British deflation and unemployment in the 1920s.51 Likewise, the failure of the Federal Reserve System to prevent the drastic decline which occurred in the U.S. money supply from 1929 to 1933 has been blamed for the severity of the Great Depression in the United States.52 One could well argue that the greatly improved performance of monetary policy and economic stability in the two countries in the post-World War II period reflects learning from past mistakes. This suggests that in considering the case for a return to the gold standard, a meaningful comparison should really be made between the post-World War II period and the gold standard. In such a comparison, the gold standard provided us with greater long-run price stability, but at the expense of both short-run real output and price stability. The higher rates of inflation and lower variability of real output (and lower unemployment) in the two countries in the recent period likely reflects changing policy preferences away from long-run price stability and toward full employment. Indeed, the strong commitment to full employment in both countries likely explains the worsening of inflation in the post-war period.53

In assessing the case for a U.S. return to a gold standard, the benefits of such a policy must be weighed against the costs. The key benefit of a return to a gold standard would be long-run price stability. The costs, however, are not inconsiderable. A commodity money standard such as the gold standard involves significant economic costs: (1) the resource costs of maintaining the standard and (2) the short-run instability of both the price level and real output that would accompany the adjustment of the commodity to changing supply and demand conditions.

Moreover, the history of the pre-World War I gold standard suggests that it worked because it was a "managed" international standard. In addition, the concentration of world capital and money markets in London and the use of sterling as a key currency enabled the system to function smoothly with limited gold reserves and to withstand a number of severe external shocks. Perhaps of paramount importance for the successful operation of the managed gold standard

49 A comparison between the two unemployment rates and the measures of real output stability reveals an interesting difference. Real output was less stable in the United States, but unemployment was higher in the United Kingdom. One explanation offered for the high and persistent unemployment in the United Kingdom in the interwar period is that it was caused by significant increases in the ratio of unemployment benefits to wages. See Daniel K. Benjamin and Levis A. Kochin, "Searching for an Explanation of Unemployment in Intervar Britain," Journal of Political Economy (June 1979), pp. 441-78.


52 See Friedman and Schwartz, A Monetary History of the United States.

was the tacit cooperation of the major participants in (ultimately) maintaining the gold standard link and its corollary, long-run price stability, as the primary goal of economic policy.\textsuperscript{34} This suggests that one country alone on the gold standard would likely find its monetary gold stock and hence its money supply subject to persistent shocks from factors beyond its control.

A fiduciary money standard based on a monetary rule of a steady and known rate of monetary growth could provide both greater price level and real output stability than a return to the gold standard. The key problem with a fiduciary system, however, is to ensure that such a rule is maintained and that a commitment be made to the goal of long-run price stability.

\textsuperscript{34}Other conditions amenable to the successful operation of the gold standard were the free mobility of labor and capital, the absence of exchange controls and the absence of any major wars.

\section*{Data Appendix}

\textbf{Chart 1}

\textbf{United Kingdom}


\textbf{Chart 2}

\textbf{United States}


\textbf{Chart 3}

\textbf{World}


\textbf{Chart 4}

\textbf{United States}


Chart 5

United Kingdom


(b) Implicit Price Deflator 1870-1979. (1972 = 100). Data for 1870-1975 from Friedman and Schwartz, Monetary Trends, Chapter 4, Table 4-A-2, col. (4); 1976-79 from International Monetary Fund, International Financial Statistics (Jan. 1981), p. 404; deflator calculated as $P = 100 \times (\text{nominal GDP/real GDP})$, real and nominal GDP appearing in IFS.


Chart 6

United States

1. Real Per Capita Income 1870-1979. (1972 dollars). This series is the result of splicing together two series, the earlier based upon data from Friedman and Schwartz, Monetary Trends and the later based upon data from U.S. Dept. of Commerce, Survey of Current Business. For 1870-1949, a real per capita income series was computed using the following data: nominal income, Friedman and Schwartz, Monetary Trends, Chapter 4, Table 4-A-1, col. (2); implicit price deflator, 1972 = 100, Chapter 4, Table 4-A-1, col. (1); population, U.S. Department of Commerce, Historical Statistics (1960). This series was then adjusted in the following way:

$$\frac{Y}{(P \times N)}_t = \exp[\ln(FS_t) + \ln(SCB_{1950}) - \ln(FS_{1950})], t = 1870, \ldots, 1949$$

where $FS_t =$ Friedman-Schwartz value of real per capita income in time $t$ and $SCB_t =$ Survey of Current Business value in time $t$. The adjusted series was then joined to the 1950-1979 series computed from the following data in the Survey of Current Business: nominal NNP, average of quarterly figures, seasonally adjusted and NNP implicit price deflator, average of quarterly figures, 1972 = 100; population data (resident population less armed forces, average of monthly figures) from U.S. Dept. of Commerce, Bureau of the Census.

Other Data Used


