Gold in the international arena: how automatic is international adjustment?

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While to the layman the idea of a modern day "gold standard" conjures up images of gold coins and bullion hidden in the crypts of Fort Knox "backing" the value of the American currency, to students of international economics, the connotation of a gold standard is quite different. To the latter, the gold standard is merely one of several alternative systems of international monetary adjustment—a system for settling, and ultimately correcting, payments imbalances in a country's international accounts. However, given the key role of the dollar in international trade (dollars are used in over 70 percent of *all* international transactions), it should be obvious to anyone, whether layman or international financier, that any unilateral move by the United States towards a gold standard would have dramatic implications for the international monetary system. This suggests that any judgment on the merits of such a move must take into consideration its international impact.

This article focuses on one small aspect of the gold standard: the supposed automaticity of the international gold standard in restoring equilibrium in a country's balance of payments. Although there are numerous other issues pertinent to the evaluation of the gold standard as a system of international adjustment, many of these issues revolve around the responses of national economies to disturbances originating abroad. These responses depend upon the speeds of adjustment of a plethora of economic variables—questions that were considered beyond the scope of this article. Rather, we will focus here on the narrow question: To what extent does the international gold standard remove the discretionary ability of governments to control their national monetary supplies, thereby forcing the adjustments necessary to restore equilibrium in the balance of payments?

To answer this question, we will first examine the intellectual roots of the idealized gold standard, the so-called price-specie flow mechanism, with a view towards understanding both the origins of the concept of international adjustment and the merits of the gold standard when it is left to operate freely. Second, we will examine the theoretical operation of the gold standard when we move from the realm of commodity money to the existence of fractionally backed or credit money. Finally, we will look briefly at the actual functioning of the gold standard during the period considered to be most representative of its operation in a pure form—the period 1879-1913.

It will be argued below that while the pure international gold standard should, in principle, function well as a system of international adjustment, its operation in practice leaves considerable room for government manipulation. Moreover, the historical record indicates that it was the threat of reserve flows (which could exist under any system of fixed exchange rates) and a specific government focus on the balance of payments that ensured a general worldwide coordination of monetary policy rather than gold flows *per se*.

The price-specie flow mechanism

The earliest analyses of the role of gold (and other precious metals as well) in the system of international trade and payments gave rise to the doctrine of mercantilism, and the system of protective trade regulations that was inspired by it. Simply stated, the doc-

trine of mercantilism emphasized the importance of having an excess of exports over imports in order to accumulate "treasure" through a favorable balance of trade. Numerous protectionist measures (the British Corn Laws were one such example) were designed to achieve this end by promoting exports and taxing imports at prohibitive levels.

This doctrine came to be criticized on several grounds (much of Adam Smith's *Wealth of Nations* is an attack on mercantilism), but some of the strongest criticisms of mercantilism came from British writers in the late 17th and early 18th centuries who argued that a policy of accumulating treasure, or "specie,"[1] was self-defeating because of the economic repercussions triggered by the build-up of specie itself. The clearest articulation of these ideas is found in the writings of David Hume, an 18th century Scottish philosopher. Hume argued that the national stock of money (or specie, since the two were synonymous in Hume's time) would take care of itself, regardless of the degree of mercantilistic intervention designed to produce a favorable balance of trade.

Hume made his case by postulating that four-fifths of all the money in Great Britain had been destroyed overnight, and then proceeding to show the consequences. Prices of British commodities and wages would fall proportionally to the decline in money. British exports would thus become less expensive relative to foreign goods, and the resultant excess of exports over imports would cause Britain to experience an inflow of specie (a balance-of-payments surplus) until the incoming money payments restored the British money supply to its "natural level."[2]

Conversely, if the British money supply were increased fivefold, prices and wages in England would rise so high that no country could purchase British commodities, while British subjects would desire to purchase only the cheaper foreign goods. The outflow of money to purchase foreign goods (a balance-of-payments deficit) would shrink the British money supply until the "level of money" in Great Britain were equal to that in neighboring countries.

The forces that caused money to seek its "natural level" were, according to Hume, self-equilibrating and symmetrical between countries, and would thus operate to maintain a fairly even balance of trade between nations. This mechanism of adjustment is known as the price-specie flow mechanism and is the classical prototype of what modern economists mean when they speak of an "international adjustment mechanism." Moreover, the mechanism also defines in a very primitive way the idealized operation of the international gold standard.

As one can see from the preceding examples, the effective functioning of the price-specie flow mechanism requires adherence to certain "rules of the game"—rules that also govern the operation of the idealized international gold standard. First, each monetary authority must take steps to fix the value of its currency in terms of gold. Second, there must be no restrictions on the flow of gold between countries. Third, each monetary authority must ensure that the issuance of notes or the creation of checking deposits is in some fixed relationship to its gold holdings.

If gold is the only acceptable money

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[1]"Specie" generally refers to money in coin. In Hume's time specie consisted of other precious metals besides gold. However, because of its physical attributes, gold eventually evolved as the preferred store of value.

[2]The concept of the "natural level" of money is a primitive concept of monetary equilibrium. Given the worldwide quantity of specie and the worldwide quantity of goods, there was presumably a "natural" price level based on the relative amounts of both. If the relationship between the quantity of goods and the quantity of money for one country were to deviate from the world relationship, presumably flows of money and goods would result until these natural levels were reestablished. This proposition first appeared in print with the works of Isaac Gervaise over 250 years ago. See Gervaise, "The System or Theory of the Trade of the World, 1720," in *Economic Tracts* (Baltimore: The Johns Hopkins Press, 1956). The theory has much in common with the modern monetary approach to the balance of payments. See Jacob A. Frenkel and Harry G. Johnson, eds., *The Monetary Approach to the Balance of Payments* (London: Allen & Unwin, 1975).

world-wide, these rules are *automatically* enforced. Together, they ensure that deficits and surpluses in a country's international transactions translate into gold flows, which in turn are translated into movements in a country's domestic money supply. However, the degree to which this mechanism is in fact self-equilibrating and self-correcting, as Hume argued, depends on the predictability and precision of the relationship between the "level of money" and prices—an issue hotly debated by economists. Morever, as should become clear in the following section, when notes or paper currency are allowed to exist in addition to, and as a substitute for gold, the operation of the price-specie flow mechanism becomes open to government "tinkering."

The theoretical operation of a gold standard

There is no such thing, even in theory, as "the" gold standard. One may define three different levels of operation of a gold standard depending on the degree to which the creation of credit money is wedded to its gold base: (1) a gold-specie standard, (2) a gold-bullion standard, and (3) a gold-exchange standard. Each of these three types of standards has differing implications for the operation of the international adjustment mechanism, and will be discussed in turn. To illustrate the operation of each of these standards, it is assumed that there are only two (fictitious) countries, America and Europa, each with a single bank which is also the monetary authority. All coin and currency are minted or exchanged by, and all deposits are held with, their respective central banks.

Under a *gold-specie standard*, gold is the only form of money, and the nation's currency is simply a unit of account for a specified weight of gold. For example, the country of America might define its currency, the dollar, as being one-half ounce of gold of a specified degree of purity. The American mint is always willing to coin one-half ounce of gold of the specified purity into a one dollar coin. Thus, the price of one-half ounce of gold can never fall below one dollar or rise above one dollar, since the two are synonymous. Moreover, if a Europan mark is defined as one-quarter ounce of gold of similar purity, the exchange rate between the mark and the dollar is fixed at two marks/dollar.

Under this system, if America sold Europa 100 bushels of wheat and received 200 gold marks in payment, the American exporters could take the 200 marks (50 ounces of gold) to the American mint and receive 100 gold dollars in return. The American money supply increases by 100 dollars, and Hume's price-specie flow mechanism begins to generate forces raising American prices and making American wheat more expensive to the Europans. Simultaneously, Europan exports become cheaper to citizens of America, since the Europan money supply declines by the amount of the gold outflow.

The important consideration under a gold-specie standard is that gold and money are synonymous. To the extent that several countries are on a gold-specie standard, the exchange rates between their domestic currencies are automatically fixed, and a self-equilibrating international monetary system comes as part of the package—but only if one accepts the existence of a fairly rigid link between the quantity of money and prices.

Under a *gold-bullion standard*, a national currency exists side by side with gold (which may or may not be coined), and the value of the currency is specified in terms of a fixed amount of gold. An individual may always sell gold at a price at least as high as that offered by the monetary authority, and a buyer may always purchase gold at least as cheaply as the government's price—which effectively fixes the price of gold and the value of national currency in terms of gold. If *two* countries are on a gold-bullion standard, the exchange rate between their currencies is fixed within the bounds set by the costs associated with gold shipment (see box).

The effects of gold flows and purchases and sales of gold by the monetary authority will have vastly different effects on the supply

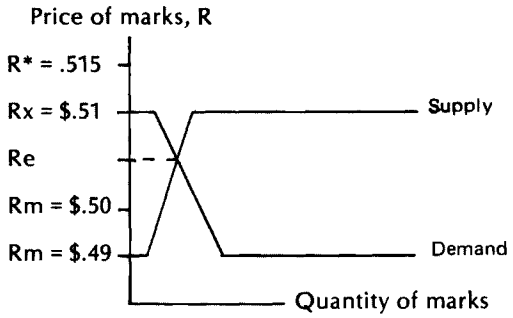
of money depending on the extent to which the monetary authority is required to maintain gold "backing" for the national currency. If 100 percent gold "backing" is required—that is, the monetary authority must hold one dollar's worth of gold in its coffers for each

Gold export and import points

Although the exchange rate between two currencies can be fixed by setting a fixed price for each of them in terms of gold, it is in fact the process of gold arbitrage* that actually maintains the exchange rate within relatively fixed limits. Since gold arbitrage has certain costs associated with it, including the cost of shipping, insurance, and interest foregone during the period of transit, the currency exchange rate can actually fluctuate between boundaries established by these costs. These boundaries are called the *gold-export point* and the *gold-import point*.

Let us derive the gold export and import points for the example in the text. If the American dollar equals one-half ounce of gold (or equivalently, if the price of gold is $2 per ounce), and if the Europan mark equals one-quarter ounce of gold, then the *mint exchange rate* equals two marks per dollar. If we further assume that it costs .04 dollars (= .08 marks) to ship one ounce of gold from America to Europa, the gold export point from America equals $.51/mark and the gold import point equals $.49/mark. (Remember that one mark equals only one-quarter ounce of gold so that the transport cost for one mark equals $.01 or .02 marks.) The gold-export point from Europa equals 2.04 marks/dollar and the gold-import point equals 1.96 marks/dollar. Simply stated, at the gold export point, the local currency is so expensive in terms of foreign currency that it pays traders to obtain foreign currency by exchanging local currency for gold at the local mint price and then gold for foreign currency at the foreign mint price, rather than exchanging local currency for foreign currency directly.

In terms of economic analysis the foreign exchange demand and supply functions become "infinitely elastic" at the gold export and import points. That is, outside the boundaries of the gold points, market adjustments consist totally of quantity changes (i.e., gold flows) rather than of both price and quantity changes. To understand this point, consider the diagram below which depicts the market for Europan marks.



The quantity of marks is on the horizontal axis, and the price of marks (in terms of dollars) is on the vertical axis. The mint exchange rate, Rm, is the price of marks established by the ratio of mint gold prices (=$.50/mark). If transport costs were as given previously and if the price of marks were for some reason to equal $.515/mark, it would pay someone who wanted to exchange dollars for marks to purchase gold at $2 per ounce, ship it to Europa at $.04 per ounce, and then sell the gold to the Europan mint for four marks. He thereby would have obtained an exchange rate of $2.04/4.00 = $.51, the same as the gold-export point. The savings of $.005/mark would equal $1,000 on a $100,000 transaction. Thus, the market for direct exchange of dollars for marks would "dry up" outside the gold points. Within the gold points, however, the exchange rate adjusts in such a way as to establish equilibrium between the supply and demand for the currencies (as at Re on the diagram). In fact, the mint rate (Rm) essentially becomes meaningless, and the exchange rate fluctuates freely between the gold points.

*Arbitrage is the process of simultaneously buying and selling in different markets to take advantage of price differentials.

paper dollar it issues—then it can issue new paper dollars only by acquiring additional gold, usually exchanging them one for one with the public. In this type of system, paper money takes the form simply of receipts for the gold deposited by the public with the central bank. However, outside the realm of 100 percent gold backing for a currency lies the fourth dimension of "credit" money.

Again using America and Europa for illustrative purposes, assume initially that America has gold dollars and paper dollars existing side by side with 100 percent gold backing of the paper currency. If an American citizen loses confidence in the paper dollar, he can always exchange it for a gold dollar and the actions of the monetary authority in doing so have no effect on the American money supply; only the relative composition of that money supply between gold and paper dollars changes.

On the other hand, if American law requires only that the monetary authority retain 50 percent gold backing behind each paper dollar, then—assuming that paper dollars had been expanded to the legal limit—an exchange of paper for gold dollars with the monetary authority forces it to contract the money supply. Suppose, for example, that an American citizen takes 50 paper dollars to the monetary authority to exchange for 50 gold dollars. Because gold holdings of the monetary authority are reduced by 50, the outstanding level of paper dollars must fall by an additional 50 (for a total of 100, including the 50 paper dollars exchanged for gold) if the monetary authority is to maintain the proper ratio to its gold "base." Similarly, if the American citizen in the example is an importer who exchanges the paper dollars for gold in order to pay a Europan exporter, there is a net contraction of 100 in the American money supply and, if Europa also maintains 50 percent gold backing of the paper mark, an increase of 100 dollars (= 200 marks) in the Europan money supply. This occurs even though the balance-of-payments transaction was only 50 dollars (= 100 marks). Stated differently, the legal gold backing ratio requires the American monetary authority to *reinforce* the monetary contraction wrought by the gold outflow and the Europan monetary authority to *reinforce* the monetary expansion wrought by the gold inflow by retracting or issuing paper money.[3]

Fractional backing to a nation's currency in the form of gold or any other commodity puts an effective ceiling on the amount of new money that can be created by the mere issuance of IOUs. Thus, by "calling in" loans to the government or selling government securities to the public, America's monetary authority can reduce its money supply by the additional 50 dollars needed to maintain its gold ratio. Similarly, by purchasing securities from the government or the public, the central bank of Europa can expand its money supply to maintain a 50 percent level of gold backing. These types of transactions are called open market operations.

To summarize, under a gold-bullion standard, the price of gold, the gold value of the currency, and the exchange rate (if the other country is on either a gold-specie or gold-bullion standard) are fixed. However, the operation of the Humean price-specie flow mechanism may be slightly different if only fractional gold backing of the national currency is required. Specifically, a fractional gold-bullion standard will result in a multiplied response of the national money supply to trade surpluses or deficits or to conversions of the domestic fiat currency into gold *if* the national monetary authority attempts to maintain a fixed fractional ratio of gold to its other monetary liabilities. The successful operation of the price-specie flow mechanism under a fractional gold-bullion standard thus requires that government decisions determine two specific rules and, in turn, that governments adhere to the rules they have established. These rules cover: the minimum level of frac-

[3]The normal procedure is for the government to auction securities to the public (borrow money) to make up any gap between its expenditures and receipts. When the monetary authority increases the money supply it does so by purchasing these securities from their holders (many of whom are banks) through government security dealers and paying for them by a check written on itself.

tional gold backing of the currency and whether or not the central bank should allow gold flows to have a *multiplied* effect on national money supplies by engaging in reinforcing open market operations to keep the ratio fixed. (As a polar case of the latter, the government might pursue a policy of "sterilization," offsetting the gold flows completely.)

Although similar in concept to both the gold-specie and gold-bullion standards, the *gold-exchange standard* allows even more scope for discretionary government decisions to interfere with the "automatic" nature of the price-specie flow mechanism. Under this system, gold coins are not put into circulation, nor does the monetary authority buy or sell its currency in exchange for gold. Rather, it buys and sells its own currency in exchange for the currency of another country that is itself on a gold-specie or gold-bullion standard. Continuing with our example, if the dollar is fixed in price in terms of gold such that America is on a gold-bullion standard, and if the monetary authority of Europa always stands ready to exchange one dollar for two marks or one mark for one-half dollar, then the mark is effectively valued in terms of gold even though it cannot be exchanged directly for gold. In this case, if the dollar is worth one-half ounce of gold, the mark is necessarily worth one-quarter ounce of gold.

This is similar to the system which was in effect from 1944 to 1971 under the terms of the Bretton Woods agreement. The U.S. dollar was fixed in terms of gold and was the only currency directly exchangeable for gold. The exchange rates of most other currencies were fixed in terms of dollars by the willingness of their national monetary authorities to buy or sell dollars at the fixed exchange rate.

However, the gold exchange standard has even more "slippages" than the bullion standard to prevent its operation as envisioned by Hume. Consider what happens if America is on a fractional gold-bullion standard, Europa is on a gold-exchange standard, and America experiences a 50 dollar deficit (as in the previous example). Because its currency is an international reserve, America uses dollars to pay for its excess imports. The Europan exporters who receive payment are likely to exchange the 50 dollars with Europa's monetary authority for 100 marks (again assuming an exchange rate fixed at two marks per dollar), increasing Europa's money supply by that amount. Under these circumstances, the degree of monetary adjustment in both countries again depends entirely on the policies and actions of their central banks.

If Europa considers the dollar an official reserve that is as "good as gold" and if it also maintains a ratio of 50 percent between official reserves and its national money supply, it must reinforce the money supply expansion by an additional 100 marks (for a total of 200, as in the previous case) to maintain that fixed ratio. Of course, if the Europan monetary authority so chooses, it can accumulate the dollar reserves without any further actions, thereby limiting the increase in its domestic money supply to the 100 marks it previously exchanged for dollars. Still another option open to the Europan monetary authority is to "sterilize" the 100 mark increase by selling 100 marks worth of government securities, thus negating the entire monetary effect of its earlier foreign exchange transaction.

The portfolio decisions of the Europan monetary authority also determine the effect of these international transactions on *America's* money supply. If the Europan monetary authority decides to hold the dollar balances it receives from the exporter in the form of demand deposits with the American central bank, the American money supply remains the same or falls by 50 dollars depending on whether it is defined to include other central bank balances. On the other hand, if Europa uses the 50 dollars to purchase government securities from the American central bank, the American money supply falls by that amount.[4] If Europa exchanges the dollars for

[4]On the other hand, if Europa purchased the securities from the American public, the money supply would remain unchanged. In the U.S. today the Federal Reserve purchases securities from the public for its central bank customers so that there is no net effect on the U.S. money supply.

gold instead of securities, the gold drain causes a multiplied contraction in the American money supply—but only if America is willing to reinforce the gold drain by contracting its money supply sufficiently to maintain a fixed gold ratio. Otherwise, America can renounce (or relax) the gold standard and offset the gold drain by open market operations.

To summarize, even under an international banking system consisting only of central banks and no commercial banking system, with all deposit money held in the form of deposits or other liabilities of these central banks, a gold exchange standard allows considerable discretion to governments and central banks. Not only is there leeway in governmental decision-making for the "center" country whose currency is used as an international reserve (the same leeway as under the gold-bullion standard), but there are additional choices open to every "satellite" country. These choices are: first, whether or not to treat holdings of the center country's currency as reserves on an equal footing with gold; second, how to divide the composition of its portfolio between gold and the currency of the center country; and third, whether to hold the currency of the center country in interest-bearing or noninterest-bearing form, or both, and in what proportion.

Although it should be easy enough to legislate rules with respect to these matters that would enable a fractionally based gold standard to operate in a manner similar to Hume's price-specie flow mechanism, the actions required of the monetary authority in adhering to these rules often impose a heavy price in terms of adjustment on the real economies involved. If changes in the money supply affected only prices, the problem would not be so complicated. But, in the short run, changes in the money supply affect a whole host of variables such as employment and interest rates in addition to just the price level. It is changes in these real variables that governments generally resist most forcefully, particularly if the prevailing world trend in these variables runs counter to the policy goals of the government. When the monetary system is complicated to include a commercial banking system, the pressures on a government to offset the effects of changes in gold on the reserves of the banking system become particularly acute.

Theory versus practice

In actual practice, the operation of the international adjustment mechanism under a gold standard is even less straightforward than the preceding simplified examples would suggest. The structures of most financial systems leave considerably more room for slippage in the linkages of a gold-centered payments system.

First, contrary to the assumptions of the examples, most deposits of the non-bank public are *not* held with central banks, but instead are held with private banks, which in turn hold their deposits with the central bank. Thus, the gold base becomes two steps removed from deposit-money liabilities, and the multiplied effect on national money supplies of a change in gold depends on the size and fixity of the ratios maintained between gold and central bank liabilities and between the latter and money. For example, if the U.S. government required the Federal Reserve to hold gold equal to 10 percent of its reserve-deposit liabilities and, in turn, required commercial banks to maintain reserves at the Fed equal to 10 percent of their own deposit liabilities, a 10 million dollar gold outflow would force the Fed to engage in reinforcing open market sales culminating in a 100 million dollar change in Federal Reserve deposits. This would force the banking system to contract deposits by 1 *billion* dollars—a multiplier of one hundred!

The pressures on the Fed to resist such drastic changes in the nation's money supply in response to international disequilibria would be great indeed. To the extent that banks hold reserves in excess of those required by the Fed, the multiplier is somewhat smaller, but an additional element of discretion on

the part of the commercial banking system is added to the supposed "automaticity" of the price-specie flow mechanism.[5]

Similarly, the existence of near-money deposits in money market funds and in U.S. nonbank financial intermediaries makes the relationship between changes in the U.S. monetary base and the various monetary aggregates even more unpredictable. Deposit interest rate ceilings in combination with volatile market interest rates induce shifts from one type of deposit money to another, such that the precise effect on any *single* measure of money is often difficult to predict.[6]

Finally, the possibility of short-term capital movements in response to expectations and interest rate differentials can seriously complicate the idealized working of the price-specie flow mechanism.[7]

But what about the empirical evidence? Did the gold standard during its historical heyday actually operate as envisioned by Hume? Or did governments intervene and "tinker" with its actual operation? To answer these questions, let us briefly examine the operation of the price-specie flow mechanism under the international gold-bullion standard just before and after the turn of the century.

The historical record

The halcyon days of the gold standard were between 1879 and 1914. This period was unusual in that it was characterized by rapid real economic growth, a relative absence of restrictions on trade and movements of capital and labor, and, in general, an absence of wars or revolutions. In terms of the conduct of monetary policy, however, there are other characteristics of this period that stand out.[8]

First and most importantly, the central banks of most trading nations did not generally engineer multiplied expansions or contractions of their money supplies in response to balance-of-payments flows. Instead, they allowed considerable flexibility in the gold "cover" ratios behind the issuance of their national currencies. A study by Arthur I. Bloomfield in 1959 compared year-to-year changes in central bank holdings of securities with changes in central bank holdings of gold over the 1880-1913 period. He found that movements in these two classes of assets were in the opposite direction 60 percent of the time, rather than in the same direction as would be predicted if monetary authorities were indeed engaging in reinforcing open market operations to maintain their money supplies in some fixed relationship to gold.[9] Bloomfield's study also found that some central banks deliberately introduced flexibility in the gold ratio by varying reserve requirements during the period, either by changing the reserve ratios or by changing the definitions of what constituted reserves.[10]

A second observation on the conduct of

[5]In actual fact most banking systems have some form of "lagged" reserve accounting which reduces the usefulness of the concept of a multiplier. What we would likely see, in the absence of a change in this type of reserve accounting, would be drastic movements of the federal funds rate in response to gold flows. Alternatively, were the Federal Reserve to use interest rates as an operating target of monetary policy (as it did prior to October, 1979), the rules of the gold standard would *force* the Fed to "sterilize", or offset, the reserve effects of gold flows by increasing or decreasing reserves to maintain the target interest rate. Thus, the question of a return to a gold standard cannot be considered without also considering the whole range of technical instruments of monetary control.

[6]Different types of deposit liabilities have different levels of reserve requirements and different interest rate ceilings. As interest rates change these various ceilings may become binding constraints on the returns to holding particular types of deposits. As people shift funds from one type of deposit to another to avoid the effect of these ceilings, the average ratio of reserves to deposits also changes, and with it the effects of a given change in reserves on the various monetary aggregates.

[7]Even under the gold bullion standard (see box), there is room for exchange rate movements between the gold points and short-term capital flows to take advantage of interest differentials between countries.

[8]See Robert M. Stern, *The Balance of Payments* (New York: Aldine, 1973), p. 112.

[9]Arthur I. Bloomfield, *Monetary Policy Under the International Gold Standard,* Federal Reserve Bank of New York, 1959, pp. 47-51.

[10]Ibid. p. 18.

monetary policies during this period concerns the key role of the discount rate as an instrument of monetary policy. Discount rate movements to induce or reverse short-term capital flows were the primary tool used by central banks to maintain stability in their exchange rates and equilibrium in their payments balances; open market operations were rarely employed.[11] In many cases discount rate changes were used to counteract the threat of gold losses or short-term capital flight, and in almost all cases they worked in a direction opposite that of central bank gold reserve changes, as would be expected.

Finally, Bloomfield's study notes that price and discount rate movements in the countries he studied were generally parallel, indicating fairly synchronous movements in individual business cycles, and in the application of monetary policy. The study further indicates that the similarity of movements in national discount rates reflected not only the broadly synchronous pattern of cyclical business activity but, in the case of many of the central banks, competitive or defensive discount rate changes. In other words, when one bank increased its discount rate, there was a tendency for others to follow suit to guard against the possibility of outflows of short-term capital or gold. Thus, there was evidence of coordination in the implementation of monetary policy, albeit not always as the result of voluntary cooperation.

What conclusions can be drawn from the findings of Bloomfield's study? Bloomfield himself concludes that the operation of the pre-1914 gold standard was less than automatic:

> Far from responding invariably in a mechanical way, and in accord with some simple or unique rule, to movements of gold and other external reserves, central banks were constantly called upon to exercise, and did exercise, discretion and judgement in a wide variety of ways. Clearly, the pre-1914 gold standard was a managed and not a quasi-automatic one from the viewpoint of the leading individual countries. Nor did that system always work as "smoothly" as is believed. Critical situations arose from time to time in various countries necessitating "emergency" measures by central banks and governments to safeguard the continuing convertibility of the currency. In all respects, then, the differences between central bank policies under the pre-1914 gold standard and after World War I were essentially differences of degree rather than of kind.[12]

Bloomfield further concludes that the ostensible "harmony" of monetary policy during the pre-1914 period, as manifested by the synchronous discount rate movements, was brought about not so much by the operation of the gold standard as by a lack of conflict between domestic policy goals and balance-of-payments equilibrium.

With a bit more hindsight, these conclusions may be extended considerably. Although price stability, generally thought of in terms of "defending the currency", was certainly a concern of central bankers during the pre-1914 period, the ability of monetary policy to influence real variables such as the rate of output or employment was not generally appreciated. Moreover, the combined use of monetary and fiscal policy to pursue such domestic objectives as full employment and price stability was also largely unknown. John Maynard Keynes' well-known treatise, *The General Theory of Employment, Interest, and Money*, which won wide acceptance for such policies, was not published until 1936. Also, reliable information on price-level movements was not immediately available for use as a monetary indicator. On the other hand, data on reserve flows *were* an immediate, tangible indicator of the state of economic activity and, as a consequence, helped to reinforce the single-minded focus on the bal-

[11] Bloomfield cities only two documented instances of open market operations during the entire period. Ibid. pp. 45-46.

[12] Ibid. p. 60.

ance of payments as the target of monetary policy.

This preoccupation with external balance exacted a high price in terms of the performance of the domestic economies. National prices and output fluctuated considerably more during the gold standard period than they have in recent years, although the gold standard period was free of the pronounced inflationary bias that has characterized many non-gold standard periods. In the United States, for example, the coefficient of variation (that is, the ratio of the standard deviation to the mean) of annual percentage changes in the price level was 17.0 for the gold standard period and 1.3 for the period 1946-1979. Likewise, the coefficient of variation of changes in real per capita income was 3.5 under the gold standard and 1.6 in the post-war period.[13] Similar results hold for the United Kingdom. Although this variation reflected downward as well as upward price movements, so that prices were stable over the long run, it remains highly doubtful whether countries today would be willing to allow such drastic fluctuations in economic activity.

As for the widespread reliance on the discount rate as the primary tool of monetary policy during the era of the gold standard, it must be remembered that the use of open market operations as a day-to-day instrument of monetary control was unknown. Moreover, government security markets in most countries were not sufficiently well-developed and integrated to enable open market operations to have the speedy, precise, and widespread impact that they have in the United States today.

It thus seems reasonable to conclude that the harmony in the implementation of monetary policy during the years of the gold standard was due, at least in part, to the primitive state of the art. The absence of any effective alternative to the discount mechanism as the primary instrument of monetary policy and the single-minded focus on balance-of-payments equilibrium as the target of that policy go a long way towards explaining the empirical evidence on the behavior of central banks under the pre-1914 gold standard.

[13]Michael David Bordo, "The Classical Gold Standard: Some Lessons for Today," *Review*, Federal Reserve Bank of St. Louis, vol. 63 (May 1981), p. 14.

Conclusion

The so-called automatic adjustment mechanism often attributed to the international gold standard leaves considerable room for slippage and, under a fractionally backed gold-bullion standard, even *requires* the assistance of governmental policy to reinforce its effects. In practice, the successful operation of the international gold standard was due not so much to the automatic equilibrating effects of gold flows as to a (historically unique) general harmony in the practice of monetary policy and the policy priority given to balance-of-payments considerations. Although the priority given to balance-of-payments considerations was certainly a result of the threat of gold reserve losses, it was also due in no small part to the fact that domestic stabilization policies were largely unknown.

From the perspective of the current international monetary system, the one lesson to be drawn from experience under the classical gold standard seems to be that the threat of reserve losses can provide pressure to harmonize monetary policies if governments are willing to abide by the rules necessary to the operation of such a standard. Recent experience also seems to indicate that the threat of exchange rate depreciation can provide similar pressure. But the willingness of nations to abide by the international gold standard presupposes a willingness to place balance-of-payments and foreign exchange considerations above domestic policy goals. Whether it is realistic to expect such a drastic reordering of priorities on the part of the world's sovereign governments is doubtful at best.