Journal of Economic Perspectives—Volume 4, Number 4—Fall 1990—Pages 85–104

Bimetallism Revisited

Milton Friedman

Throughout recorded history, monetary systems have generally been based on a physical commodity. Numerous commodities have served this purpose, though metals have been the most widely used and the precious metals, silver and gold, above all. As between them, "silver composed nearly the entire circulating metallic currency of Europe" until at least the late nineteenth century (Martin, 1977, p. 642), and also of India and Asia. Gold was used much less, primarily for high-valued transactions.

Generally, a legal rate of exchange between silver and gold was specified by the authorities, although sometimes that was not done. Under the resulting bimetallic system, an authorized mint stood ready to coin, for anyone who requested it to do so, either silver or gold into coins of designated face value and specified weight and fineness on demand ("free coinage"), typically for a small seignorage charge to cover the cost of minting, though sometimes, as in Great Britain and the United States, gratuitously. The legal price ratio was determined by the weights assigned to the silver and gold coins. For example, from 1837 to the Civil War, the U.S. gold dollar was defined as equal to 23.22 grains of pure gold, the silver dollar as equal to 371.25 grains of pure silver or 15.988 times as many grains of silver as of gold, rounded in common parlance to a ratio of 16 to 1.

A strictly equivalent way to define a bimetallic standard is in terms of a government commitment to buy either gold or silver at fixed prices in money designated as legal tender. For the U.S. example, the corresponding fixed

■ *Milton Friedman is Senior Research Fellow at the Hoover Institution, Stanford, California, and Professor Emeritus of Economics, University of Chicago, Chicago, Illinois.*

prices were $20.67 per fine ounce of gold or $1.29 per fine ounce of silver.[1] That remained the legal price of gold until 1933, when President Roosevelt raised it in stages and then fixed it at $35 an ounce in early 1934.

Though either silver or gold could legally be used as money, in practice it might be that only one of the metals would be so used. In addition to their use as money, both silver and gold had important nonmonetary uses—for jewelry and industrial use. When the market price ratio differed substantially from the legal ratio, only the metal that was cheaper at the market price than at the legal ratio would be brought to the mint for coinage. For example, if one ounce of gold sold on the market for the same number of dollars as 15.5 ounces of silver when the legal ratio was 16 to 1, a holder of silver would do better by exchanging his silver for gold at the market ratio and taking the gold to the mint than by taking the silver directly to the mint.

To put the matter in another way, if the mint were a two-way street at a 16 to 1 ratio, an obvious get-rich scheme would be to bring one ounce of gold to the mint, get 16 ounces of silver, sell the silver on the market and with the proceeds buy more than one ounce of gold, pocket the profit and keep going. Clearly the mint would soon be overflowing with gold and out of silver. That is why the mint's commitment under a bimetallic standard is solely to buy silver or gold (that is, coin freely) at fixed prices. If asked to redeem legal tender currency (whether coins or notes) in specie, it is free to redeem it at its discretion in either metal.

The situation in the United States from 1837 to the Civil War was roughly as just described: the legal ratio was 16 to 1; the market ratio, 15.5 to 1. The result was that the U.S. was effectively on a gold standard. Silver might still be used for less than full-bodied minor coins (that is, coins containing less silver than the amount that, at the legal price, would be valued at the face value of the coin) and for international monetary transactions, but not at par value, only at a premium.

Beginning in the early 1870s, most advanced countries, including the United States in 1879, shifted to a monometallic gold standard—a standard under which only the price of gold was legally fixed—leaving India and China as the only two populous countries relying primarily on silver. Silver was still used elsewhere but only for minor coin. After World War I, the link between money and gold was progressively loosened, a gold exchange standard (that is, a commitment by governments to redeem their money in either gold or a foreign currency that was redeemable in gold) replacing a strict gold standard as the norm. After World War II, the Bretton Woods agreement setting up the International Monetary Fund gave gold an even smaller role, requiring convertibility into gold only for the United States and only for external purposes. This final link was ended by President Richard Nixon on August 15, 1971,

[1]These are the rounded prices. There are 480 grains in a fine ounce of gold, so the exact legal price of gold was 480/23.22, or $20.6711835 . . . and of silver, 480/371.25, or $1.2929 . . . .

when, in monetary jargon, he "closed the gold window" and thus refused to honor the U.S. commitment under the International Monetary Fund agreement to sell gold to foreign central banks at $35 an ounce. Since then, every major country has adopted an inconvertible paper or fiat standard, not as an emergency measure expected to be temporary, but as a system intended to be permanent. Such a worldwide fiat monetary system has no historical precedent.

Up to the present, the fiat monetary system has been characterized by wide fluctuations in price levels, interest rates, and exchange rates, as the major nations have been trying to learn to navigate in uncharted waters, trying to find some anchor for the price level other than conversion into a commodity. Whether and, if so, when the fiat system will lead to acceptable results remains an open question.[2] Hence a discussion of perhaps the most common earlier world system, bimetallism, may be of more than historical interest.

Until recently, I shared what I take to be the conventional view of monetary economists about the relative merits of bimetallism and gold monometallism: namely, that bimetallism is an unstable and unsatisfactory monetary standard involving frequent shifts between alternative monometallic standards; that monometallism is preferable, and that gold monometallism is preferable to silver monometallism.[3]

In the course of doing research on U.S. monetary history during the nineteenth century, I discovered, much to my surprise, that the conventional view is dubious, if not outright wrong, with respect to both the superiority of monometallism over bimetallism and the superiority of gold monometallism over silver monometallism.

Historical Experience

In his 1791 Treasury Report on the Establishment of the Mint, in which he recommended the adoption of a bimetallic standard, Alexander Hamilton

[2]For one view, see Friedman (1985).

[3]It is not easy to document these judgments since few contemporary textbooks on money or macroeconomics even mention bimetallism. They almost all have some reference to the gold standard, typically taking it for granted that a gold standard is the only kind of commodity standard that needs to be mentioned. I have examined seven popular monetary and macroeconomics texts, dated from 1968 to 1986. Only two mention a bimetallic standard, and only the earliest has any reasoned discussion of its advantages and disadvantages and that in a footnote, noting that "criticism of the system [bimetallism] has doubtless been overdone" (Culbertson, 1968, p. 133n.). I have also examined seven texts on American economic history, dated from 1964 to 1987. All of course discuss the use of different commodities as monetary standards, bimetallism, and the shift to a gold standard. However, the approach is generally strictly factual and, with one exception, conventional. For example, the most recent, and I understand also the most widely used, states flatly, "Bimetallism is a poor metallic system to use because the two metals fluctuate constantly *against each other* in price with strange results." Further, "Silver had been driven from circulation by the rise in gold supplies in the 1840s and 1850s . . . . Therefore, in 1873 the Coinage Act omitted any provision for the resumption of the minting of silver dollars" (Hughes, 1987, pp. 175–76, 360).

([1791] 1969, p. 167) wrote,

> Gold may, perhaps, in certain senses, be said to have greater stability than silver: as, being of superior value, less liberties have been taken with it, in the regulation of different countries. Its standard has remained more uniform, and it has, in other respects, undergone fewer changes; as being not so much an article of merchandise, . . . it is less liable to be influenced by circumstances of commercial demand.

Hamilton nonetheless chose bimetallism on the purely pragmatic grounds that silver was the metal in more common use, most specie in the thirteen states was silver, in the form of foreign coins, and gold was rare. He chose a ratio of 15 : 1 because that was the market ratio at the time, at the same time recognizing that the ratio was subject to variation and urging that "care be taken to regulate the proportion between [the metals], with an eye to their average commercial value" ([1791] 1969, p. 168). Very shortly thereafter, however, the market ratio rose, conforming with the legal ratio in France, which was 15.5 : 1, and the Congress did not heed Hamilton's counsel, leaving the legal ratio at 15 : 1 until 1834. As a result, silver became the de facto standard until 1834, when the Congress altered the legal ratio to 16 : 1, and gold became the de facto standard from then to the Civil War. In 1862, redemption of currency in specie was suspended and a pure fiat currency, popularly known as "greenbacks," was issued to help finance the Civil War. An 1873 coinage act designed to prepare the way for resumption of specie payments ended the "free coinage" of silver and limited its legal tender status, so that when resumption (that is, convertibility of legal tender into gold) was achieved in 1879, it was on the basis of gold. That in turn unleashed the "free-silver" movement of the 1880s and 1890s that culminated in William Jennings Bryan's 1896 campaign under the flag of 16 : 1.

The U.S. experience doubtless helped form the conventional view, as stated for example by Ludwig von Mises (1953, p. 75), that the bimetallic "standard was . . . turned, not into a double standard, as the legislators had intended, but into an alternative standard."

While that is possible and has often been the case, as it was in the United States before the Civil War, and in Britain for several centuries before the Napoleonic wars, it is not at all inevitable. As Irving Fisher (1911, p. 132) points out,

> The history of France and the Latin Union during the period from 1785, and especially from 1803, to 1873 is instructive. It affords a practical illustration of the theory that when conditions are favorable, gold and silver can be kept tied together for a considerable period by means of bimetallism. During this period the public was ordinarily unconscious of any disparity of value, and only observed the changes from the relative

> predominance of gold to the relative predominance of silver in the currency and *vice versa*.

France's success in maintaining both full-bodied gold and silver coins in circulation over such a long period reflected several factors. The first was France's economic importance relative to the rest of the world, which was far greater then than it is now. A second was the exceptionally high propensity of the French to use specie as money, both directly as coins and indirectly as reserves for paper currency and deposits.[4] These two factors made France a major participant in the market for silver and gold, important enough to be able to peg the price ratio despite major changes in relative production of silver and gold.[5] In Fisher's words (1911, pp. 133–34),

> From 1803 until about 1850 the tendency was for silver to displace gold . . . . By 1850 . . . [b]imetallism would have broken down and resulted in monometallism . . . , except for the fact that, as though to save the day, gold had just been discovered in California. The consequence of the new and increased gold production was a reverse movement, an inflow of gold into the French currency and an outflow of silver . . . . It seemed probable that France would be entirely drained of her silver currency and come to a gold basis . . . . But the new gold mines were gradually exhausted, while silver production increased, with the consequence that there was again a reversal of movement.

France absorbed in its money stock more than half of the world's total output of gold from 1850 to 1870, while holding the amount of silver almost constant.[6] As a result, the market price ratio, which was 15.7 in 1850, never fell below 15.2 (in 1859) and was back up to 15.6 by 1870 (Warren and Pearson, 1933, p. 144).

Finally, the conventional view implicitly assumes that the legal gold-silver price ratio is a knife-edge, so that the least departure of the market ratio from the legal ratio would rapidly send all of the coins minted from the now more valuable metal to the melting pot for sale on the market. That turned out not to

[4]In 1880, gold and silver coins accounted for more than 70 percent of all transactions balances (coins plus paper money plus bank deposits), when the corresponding fraction for the U.S. was about 15 percent. Source for France, Saint Marc (1983, pp. 23-33); for the United States, Friedman and Schwartz (1963, pp. 131, 174).

[5]To illustrate its importance, in both 1850 and 1870, monetary silver in France amounted to more than 10 percent of all the silver produced in the world from 1493 on; in 1850, monetary gold in France was about one-third of the world's monetary gold stock; in 1870, more than one-half. (I have been unable to find estimates of the world's monetary silver stock which is why I compared the French monetary silver with total production.) Source for France, Saint Marc (1983, pp. 23-33); for the world gold stock, Warren and Pearson (1933, pp. 78-79).

[6]The ratio of ounces of silver to ounces of gold in its monetary stock fell from 41 to 8, entirely via an increase in gold.

be the case. The situation is comparable to exchange rates between currencies under a strict gold standard. The legally specified specie contents of the national currencies define a "par" exchange rate (for example, from 1879–1914, $4.86649 . . . for one British pound).[7] If the market exchange rate deviates from par, there is opportunity for arbitrage by exchanging the cheaper currency for gold, shipping the gold to the other country, converting the gold into the other currency, and converting the proceeds into the cheaper currency on the market. For the arbitrage to be profitable, the difference between the market exchange rate and par must be large enough to cover the costs of insurance, shipping the gold, and any other expenses. The par exchange rate plus or minus these costs defines the so-called "gold points" between which the market exchange rate can fluctuate without shipment of gold in either direction.

In precisely parallel fashion, costs are incurred under a bimetallic standard in converting the undervalued coins into specie and selling the specie on the market. These costs define upper and lower "gold-silver price ratio points" between which the market ratio can vary without producing the complete replacement of one metal by the other. The width of the range depends on the seignorage charge, the cost of melting coins, delays and associated loss of interest, insurance fees, and so on.[8]

The bimetallic standard ended when it did because of the Franco-Prussian War of 1870–71. France suffered a devastating defeat and was forced to pay a huge war indemnity in funds convertible to gold. Germany used the war indemnity to finance its own shift from a silver standard to a gold standard—a tribute to the example of Britain, the country that German leaders desperately wanted to surpass in economic power and which had been on gold since 1821. In the process, Germany also dumped on the market large quantities of silver withdrawn from circulation. France was not willing to accept the major inflation (in terms of silver) that would have been produced by the combined effect of the drain of gold and the flood of silver. Accordingly, she closed her mints to the free coinage of silver and subsequently adopted a gold standard.[9]

A remarkable feature of the French experience under bimetallism is that "through twenty years of war, at times against half Europe, [Napoleon] never once allowed a resort to the delusive expedient of inconvertible paper money" (Walker, 1896b, p. 87). That was almost certainly a tribute to the cautionary example of the Assignat hyperinflation (White, 1896) that helped bring Napoleon to power rather than to any peculiar virtue of bimetallism over monometallism. To the best of my knowledge, no other major war has ever

[7]The pound sterling was defined as 113 grains of pure gold, the U.S. dollar as 23.22 grains; the ratio of these two numbers gives the par exchange rate.

[8]In a private communication dated April 24, 1989, Angela Redish suggests that the widest plausible limits, allowing for mint costs and 1 percent transactions costs, were 15.3 to 15.89. The limits of the market ratio cited are imperfect estimates, so are not seriously in conflict with her estimated range.

[9]Walker (1896*b*, chapters 4, 5, and 6) has an excellent discussion of this episode as well as of prior French experience.

been conducted without resort to depreciation of the currency (in earlier times, by adulterating the currency, changing the nominal value of the coinage, and similar expedients; in recent centuries, by suspending specie payments and resorting to inconvertible paper money). France's behavior contrasts sharply with that of Britain. Britain, which had been on a legal bimetallic but de facto gold standard, ended specie payments in 1797 and did not resume specie payments until 1821.

During the 1870s, not only Germany and France, but many other countries shifted from bimetallism to gold, culminating in U.S. resumption in 1879. The effect was a rapid fall and wide fluctuations in the market price of silver relative to gold, so that the market gold-silver price ratio had nearly doubled by 1896, when Bryan gave his famous "Cross of Gold" speech and made 16:1 his battle cry.

In another paper, I have estimated the hypothetical U.S. price level and, as a by-product, the hypothetical gold-silver price ratio that would have prevailed if the U.S. had returned to the prewar bimetallic standard after the Civil War instead of eliminating the free coinage of silver in the Coinage Act of 1873 and resuming the convertibility of legal tender into specie on a gold basis in 1879. These estimates indicate that, however absurd 16 : 1 may have appeared by 1896, it was not absurd at all in the 1870s. If silver had not been demonetized, the U.S. would have resumed convertibility on a silver basis in 1876, when the nominal market price of silver in the U.S. first exceeded the legal price of $1.2929..., instead of resuming convertibility in gold in 1879. If that had occurred, I estimate that the market gold-silver price ratio would have remained fairly close to 16 : 1 until at least 1914, when World War I started. The ability of France to maintain an effective bimetallic standard for 70 years, despite wide swings in the relative supplies of silver and gold, strengthens my confidence in these estimates. If I am anywhere close to right, "the U.S. could have played the same role after 1873 in stabilizing the gold-silver price ratio that France did before 1873" (Friedman, 1990). The result would have been a stabler price level in both the United States and the gold standard countries.

The Scholarly Literature on Bimetallism

Like the historical evidence, the scholarly literature of the time does not support the conventional view. On the contrary, as Schumpeter put it in his *History of Economic Analysis* (1954, p. 1076), "[B]imetallism was the chief hunting ground of monetary monomaniacs. Nevertheless, it is the fact—a fact that these semi-pathological products and also the victory of the gold party tend to obliterate—that, on its highest level, the bimetallist argument really had the better of the controversy, even apart from the support that a number of men of scientific standing extended to the cause of bimetallism." Schumpeter adds in a footnote (p. 1076) that the "outstanding purely analytic performance on bimet-

allism is that of Walras (*Éléments, leçons* 31 and 32)."[10] As Walras (1954, lesson 32, p. 359) put it, in a carefully qualified statement, "In short, bimetallism is as much at the mercy of chance as monometallism so far as the stability of value of the monetary standard is concerned; only bimetallism has a few more chances in its favour."

Schumpeter may be right in his judgment of the quality of Walras's analysis. However, Irving Fisher's (1911) analysis is equally rigorous and far more accessible. His succinct conclusion (ch. 7, pp. 126–27) is that "bimetallism, impossible at one [legal] ratio [between the prices of the two monetary metals], is always possible at another. There will always be two limiting ratios between which bimetallism is possible." Note that Fisher's limiting ratios are not the "gold-silver price ratio points" referred to earlier: those define the range of *market* price ratios consistent with a fixed legal price ratio. Fisher's limiting ratios define the range of *legal* price ratios at which it would be feasible to keep both gold and silver in circulation for given conditions of demand and supply of gold and silver. A different division of new production of gold and silver would correspond to each such legal ratio. At the lower limiting gold-silver price ratio, the bulk of new gold production would go to nonmonetary uses and the bimetallic standard would be on the verge of becoming a monometallic silver standard; at the upper limiting ratio, the bulk of new silver production would go to nonmonetary uses and the bimetallic standard would be on the verge of becoming a monometallic gold standard.

No great importance attaches to the maintenance of one or another market ratio for its own sake, except perhaps to persons involved in mining silver or gold. The important general question is the behavior of the price level: which monetary system, bimetallism, silver monometallism or gold monometallism, will lead to a stabler price level over time or to a stabler real value of the monetary unit? Fisher's answer (ch. 7, pp. 126–27) is that, when the legal bimetallic ratio is effective, then

> in a series of years, the bimetallic level [of the real value of the monetary unit] remains intermediate between the changing levels which the two metals would separately follow. Bimetallism spreads the effect of any single fluctuation over the combined gold and silver markets.... It should be pointed out that the equalizing effect maintained is relative only. It is conceivable that one metal would be steadier alone than when joined to the other.[11]

[10]Schumpeter makes it clear that the "monetary monomaniacs" he refers to are among "the silver men," not the "sponsors of gold." In that respect, he shared the conventional view. My own opinion, as that of Francis A. Walker, to whose work Schumpeter refers as "of undoubted scientific standing," is that the pro-gold cause had its share of monetary monomaniacs.

[11]The analysis was spelled out much earlier in Fisher (1894, pp. 527-37).

Note that a bimetallic standard always yields a steadier price level than at least one of two alternative monometallic standards and may yield a steadier price level than either. This is what Walras meant by "more chances."

Proponents and Opponents of Bimetallism

Writing in 1896 at the height of the agitation for "free silver," Francis A. Walker (1896b, pp. 217–19) gives an excellent description of the

> three classes of persons in the United States who have been wont to call themselves bimetallists. We have, first, the inhabitants of the silver-producing states. These citizens have what is called a particular interest, as distinct from a participation in the general interest... Their interest in the maintenance of silver as a money metal has been of the same nature as the interest of Pennsylvanians in the duties on pig iron... Although the silver-mining industry of the country is not large... it has yet been able to exert a high degree of power in our politics, partly because of our system of equal representation in the Senate, partly because of the eagerness and intensity with which the object has been pursued. The second of the three classes... consists of those who, without any particular interest in the production of silver, are yet, in their general economic views, in favor of superabundant and cheap money. Among the leaders of this element have been found the very men who, between 1868 and 1876, were foremost in advocating the greenback heresy [which, needless to say, is today's orthodoxy]. Beaten on the issue of greenback inflation, they have taken up the issue of silver inflation.... They are for depreciated silver, because, in their view, it is the next best thing (by which they mean what we would call the next worst thing) to greenbacks. Those who constitute the element now under consideration are not true bimetallists. What they really want is silver inflation [they are Schumpeter's "monetary monomaniacs"].
>
> The third element... comprises the convinced bimetallists of the country; men who believe, with Alexander Hamilton and the founders of the republic, that it is best to base the circulation upon both the precious metals. They are not inflationists, although... they strongly deprecate contraction.[12]

The persons who called themselves monometallists or "hard-money men" and favored a gold standard consisted of three parallel classes of persons:

[12]Francis A. Walker was a volunteer in the Civil War who was promoted to a general after the war ended, and had a distinguished career as a statistician, economist, and educational administrator. He directed the censuses of 1870 and 1880, was a Professor of Economics at Yale University, and President of the Massachusetts Institute of Technology from 1881 to his death in 1897.

those with interests in gold-mining; deflationists castigated by the free-silver forces, with some justice, as "Wall Street"; convinced monometallists who interpreted the economic preeminence of Britain as testimony to the virtues of a gold standard, and the move by many European countries in the 1870s from bimetallism to gold as testimony to the fragility of bimetallism.

The controversy was not restricted to the United States. It raged in Britain, France, and indeed throughout the world. Elsewhere also, the participants were divided into the same classes, though, among advocates of bimetallism, the first class included not only silver-mining interests, but, especially in Britain, persons involved in trade with India, which was on a silver standard with free coinage until 1893, and, everywhere, persons involved in trade with China, which was on a silver standard until the late 1930s. Traders with India and China favored bimetallism for the same reasons that exporters today favor fixed exchange rates: to reduce the inconvenience and risks accompanying a fluctuating exchange rate.

The division among the three classes is not ironclad. A clear example for the United States is the first and longtime chairman of the Department of Economics of the University of Chicago, James Laurence Laughlin. His 1885 book, *The History of Bimetallism in the United States*, was unquestionably a major scholarly contribution and was cited by both proponents and opponents of bimetallism. Yet he was also a highly active leader of the "hard-money" opposition to the free-silver movement. In that capacity, he was dogmatic and demagogic. Monetary scholars like Francis A. Walker and Irving Fisher almost surely shared his opposition to the specific proposals of populist advocates of free silver, yet were apparently embarrassed by his dogmatism and by what they considered, in my view correctly, his bad economics, since they went out of their way to dissociate their views from his.

An example for Great Britain is Sir Robert Giffen, immortalized by Marshall in the "Giffen paradox." Popular articles by him on the subject, dating from 1879 to 1890, were republished in a book entitled *The Case Against Bimetallism* ([1892] 1896). Whatever the basis for his high repute may have been, the book provides ample evidence that command of monetary theory was not among them.[13]

Views about Actual Bimetallic Proposals

Most scholars who were persuaded that bimetallism is in principle preferable to monometallism opposed the particular practical proposals for bimetallism that were at the center of the political debate. They did so for two sets of reasons: the lure of still better reforms; practical considerations.

[13]Evidence of Giffen's repute is the diplomacy with which F. Y. Edgeworth (1895, p. 435) prefaces his refutation of one of Giffen's fallacies: "An argument advanced by Mr. Giffen ... is not likely to be open to dispute. It is with great diffidence that the following counter-reasoning is submitted."

The Better versus the Good

W. Stanley Jevons ([1875] 1890, pp. 328–33) favored a "tabular" standard, under which the monetary unit, at least for long-term contracts, would be adjusted for changes in general prices—the system that has come to be designated indexation.

Alfred Marshall also favored a tabular standard but regarded it as an impracticable ideal except for long-term contracts. He supported what F. Y. Edgeworth labelled symmetallism as a less extreme departure from a gold standard than a thoroughgoing tabular standard yet preferable to bimetallism (Marshall, 1926, pp. 12–15, 26–31).[14] A symmetallic standard is one in which the monetary unit would be a composite of two metals, i.e., "a unit of gold *and* so many units of silver—a linked bar on which a paper currency may be based" (Edgeworth, 1895, p. 442). Under a bimetallic standard, the relative price of the two metals is fixed; the relative quantities used as money are variable. Under a symmetallic standard, the relative quantities of the metals used as money are fixed and the relative price is variable; hence there is no danger that a legal symmetallic standard will be converted into a de facto monometallic standard.

Léon Walras (1954, p. 361) favored a gold standard with a "silver regulator" managed by the monetary authorities so as to keep prices stable.

Irving Fisher (1913, p. 495) favored a "compensated dollar" or a system under which the gold equivalent of the dollar would be varied to keep a broad-based price index constant; that is, the weight in gold of the dollar would be changed "to compensate for the [change] in the purchasing power of each grain of gold."

Francis A. Walker opposed the adoption of bimetallism by the U.S. unilaterally but favored international bimetallism—that is, an agreement by a substantial number of countries to adopt a single legal gold-silver price ratio.[15] Essentially all responsible supporters of bimetallism, even those in favor of its unilateral adoption by a single country, preferred international bimetallism. This sentiment was reflected in a series of international conferences on the subject, all of which ended in failure.

Practical Considerations

One important consideration was the proposed legal gold-silver price ratio. As Fisher pointed out, a range of legal ratios was consistent with the maintenance of a bimetallic currency. However, if different countries adopt different ratios, clearly only one can be effective. While I believe that 16 : 1 was feasible

[14] Francis A. Walker (1893, p. 175, n. 1) wrote, "Prof. Alfred Marshall, of Cambridge, easily the head of the English economists, has more than once told me that, as between bimetallism and gold monometallism, he is a bimetallist."

[15] "Though a bimetallist, of the international type, to the very center of my being, I have ever considered the efforts made by this country, for itself alone, to rehabilitate silver as prejudicial equally to our own national interests and to the cause of true international bimetallism" (Walker 1896b, p. iv).

for the U.S. in 1873, "by 1896 it was almost surely too late to undo the damage; Bryan may have been trying to close the barn door after the horse had been stolen" (Friedman, 1990). And contemporary writers expressed similar views. Writing in 1896, Walker (1896b, pp. 212–13) says,

> While declining thus to discuss the actual ratio in any attempt to restore international bimetallism, I do not hesitate to say that all talk about taking the existing ratio of the market, say 30 : 1 as the ratio for the bimetallic mints, is simply silly. Silver has fallen to 30 for 1 of gold, because of demonetization. Remonetization, even by a weak league, would necessarily and instantly put it clear back and would hold it there against any but revolutionary forces . . . . The "factor of safety" will be smaller with the old ratio [15.5 : 1] than it would be with a new ratio somewhat more favorable to gold—say, 18 or 20 : 1. Yet, notwithstanding this, the "factor of safety" might still be sufficient . . . to enable [bimetallism] to do its beneficent work at the old ratio.

He apparently did not regard the U.S. alone as equivalent to even a "weak league," since he opposed Bryan's proposal that the U.S. unilaterally adopt bimetallism at a 16 : 1 ratio. In an "Address on International Bimetallism" that he delivered a few days after the 1896 election, he referred to the defeat of Bryan as "the passing of a great storm" ([1896a] 1899, 1 : 251). In his book, *International Bimetallism*, Walker (1896b, p. 220) expressed the view that the U.S. "is not and has never been in a position to exert an equal effect [to France alone] upon the market for the money metals." As already noted, my own examination of the empirical evidence suggests that his "has never" was an overstatement, though his "is" was probably correct.

Writing in 1888, one of the ablest of the British economists in favor of bimetallism, J. Shield Nicholson ([1888] 1895, pp. 270, 288), regarded the reestablishment of a ratio of 15.5 : 1 as entirely feasible if there were international agreement, agreeing in this respect with Walker. So far as I know, he did not express any view on the feasibility of unilateral adoption by Britain or the United States of a similar ratio.

Jevons is perhaps the best example of an economist who recognized the theoretical case for bimetallism yet vigorously opposed bimetallism on practical grounds. In a letter of 1868 to a supporter of bimetallism, he summarized his views (1884, p. 306; italics in original) by saying, "I must acknowledge that *in theory* you and the other defenders of what may be called *the alternative standard* are right. But in the *practical aspect* the subject looks very different, and I am inclined to hope for the extension of *the single gold standard*." The major practical considerations he cites in the letter (pp. 305–306) are:

> I cannot see any prospect of a serious rise in the value of the precious metals . . . . The danger, therefore, that the value of gold would rise, and the burdens of nations become increased, is of an uncertain nature . . .

> On the other hand, the conveniences of a single gold standard are of a tangible and certain nature. The weight of the money is decreased to the least possible amount, without the use of paper representative money. There is a simplicity and convenience about the system which has recommended it to the English during the half century which has passed since our new sovereigns were issued. The operation of our law of 1816 has, in fact, been so successful in most respects that I should despair altogether of the English people or Government ever being brought to adopt the double standard in place of it. I was glad, therefore, to see that the monetary convention had decided in favour of a single gold standard.[16]

Here and in other publications, Jevons places great emphasis on the inconvenience to wealthier countries of silver money because it weighs so much more than a quantity of gold of the same value. The argument presumes that a large fraction of transactions are conducted with coined money, which may have been true in his day, but rapidly became less and less important with the wider use of token subsidiary coins, paper money, and deposits. Even in his day, it was in part true only because the Bank of England was prohibited from issuing notes of lower denomination than five pounds, a factor that was irrelevant in the United States.

In subsequent publications, Jevons repeated these objections in ever stronger terms. In 1875, after the closing of the mints to silver in France and the adoption of the gold standard by Germany: "The price of silver has fallen in consequence of the German currency reforms, but it is by no means certain that it will fall further than it has already done. That any great rise will really happen in the purchasing power of gold [that is, a fall in the price level in terms of gold] is wholly a matter of speculation . . . [A]s a mere guess, I should say that it is not likely to rise" ([1875] 1890, p. 143). In 1877 (1884, pp. 308, 309, 311; italics in original):

> In nothing is the English nation so conservative as in matters of currency . . .
>
> [I]f the United States were to adopt the double standard, they would throw into confusion the monetary relations of the foremost commercial nations while the universal bimetallism essential to the success of M. Cernushi's schemes would be as far distant as ever . . .
>
> To say the least, it is quite open to argument that silver is now a metal less steady in value than gold . . . . Under these circumstances, it is proba-

[16] Jevons's best and most concise statement of the theoretical case for bimetallism is in *Money and the Mechanism of Exchange* ([1875] 1890, pp. 137–38). Fisher refers to this discussion in his "The Mechanics of Bimetallism" (1894), where he presents a much more thorough and definitive analysis. He also notes that after his article was prepared he discovered that Walras "has covered nearly the same ground and expressed substantially the same conclusions" as in part of Fisher's article (1894, p. 529, n. 1).

> ble that the double standard, or, as it ought to be called, the *alternative standard* will be really less steady in value than the gold standard alone.[17]

Despite his deserved reputation as a pioneer in economic statistics, Jevons was almost consistently wrong in his empirical predictions. The price of silver in terms of gold fell drastically, the real price of gold rose, the nominal price level fell, and, if anything, gold became more unstable in production than silver.[18]

Jevon's famous journalistic contemporary, Walter Bagehot, wrote a series of articles in *The Economist* in 1876 on the silver question. These were collected and published shortly after Bagehot's death in 1877 in a monograph entitled *Depreciation of Silver*. The articles deal mainly with the problems raised for Britain's trade with India by the depreciation of silver—inevitably leading to a discussion of bimetallism, which Bagehot vigorously opposed. Though Bagehot's theoretical analysis is much inferior to Jevons's, the practical considerations he cites in opposition to bimetallism duplicate Jevons's, including Jevons's erroneous predictions, in particular that the "fall" in the price of silver in 1876 was "only a momentary accident in a new and weak market, and not the permanent effect of lasting causes" (Bagehot [1877] 1891, 5 : 523). Like Jevons, he regards as a major consideration (5 : 613) that "England has a currency now resting solely on the gold standard, which exactly suits her wants, which is known throughout the civilized world as hers, and which is most closely united to all her mercantile and banking habits. What motive, that an English Parliament could ever be got to understand, is there that would induce them to alter it?"[19]

I have quoted at length the practical considerations stressed by Jevons and Bagehot because, while they were among the first to stress them, the same considerations undoubtedly played a major role in the opposition to or lukewarm support of bimetallism by almost all later British writers on the subject, including both Marshall and Edgeworth. Similarly, the very different practical circumstances of France and the United States explain why those countries produced the most vigorous support for bimetallism by not only Schumpeter's "monetary monomaniacs" but also respected scholars.

Gold versus Silver Monometallism

Britain's adoption of a monometallic gold standard in 1816, and its subsequent resumption of convertibility of legal tender into specie on the basis of gold on May 1, 1821, as a result of Peel's Act of 1819, was undoubtedly the key factor that made gold the world's dominant monetary metal (Feavearyear,

[17]Cernushi was a well-known French bimetallist.

[18]Interestingly enough, his predictions in another field, the future role and availability of coal, were equally far from the mark (Jevons, 1865).

[19]Bagehot also expresses doubt that the French would demonetize silver, which they did very soon thereafter.

1963, pp. 212–23). It had that effect partly because Britain's subsequent rise to economic preeminence in the world was attributed, rightly or wrongly, in considerable measure to its adoption of a strict gold standard; partly because Britain's preeminence gave special importance to the exchange rates between sterling and other currencies.

Why did Britain adopt a monometallic standard instead of returning to earlier bimetallism? And why gold instead of silver? In a recent paper, Angela Redish (1988, p. 1) states, "The historical literature has typically explained the emergence of the gold standard as a matter of happenstance: The legislation of 1816 merely ratified the *de facto* gold standard that had existed in England since the overvaluation of gold at the beginning of the eighteenth century." She disagrees, concluding (pp. 21–22) that "England abandoned bimetallism in 1816 because a gold standard with a complementary token silver coinage offered the possibility of a medium of exchange with high and low denomination coins circulating concurrently. The gold standard succeeded because the new technology employed by the Mint was able to make [gold and token silver] coins that counterfeiters could not copy cheaply, and because the Mint accepted the responsibility of guaranteeing the convertibility of tokens."

The currency system Redish describes was indeed one consequence of the reform. As Feavearyear (1963, p. 226) put it, "Peel's Act had left the pound upon a basis which approached more nearly to a completely automatic metallic standard than at any other time before or since. The seignorage and other mint charges had long been abolished . . . . [T]he introduction of improved machinery into the Mint, together with the growth of a more efficient organization for the detection of crime, was beginning to defeat the counterfeiter. Gold was more difficult to counterfeit than silver."

However, while consequence and partial cause, I believe that achieving a satisfactory silver token coinage would not have been a valid reason for returning to gold rather than silver. France maintained a successful bimetallic system for 75 years in which high and low denomination full-bodied coins circulated simultaneously, though the proportion between the two metals in the circulation changed from time to time. Redish rejects that possibility because she implicitly regards the legal ratio as a knife-edge, requiring either frequent recoining or changes in the nominal value of coins or shifts between alternate standards. The experience of France indicates both that there is a range of tolerance around the legal bimetallic ratio that is wide enough so that minor changes in the market ratio can be absorbed without difficulty and also that the adoption of a single legal ratio by one or more major financial powers has a significant stabilizing influence on the market ratio. The difficulty that Britain had in maintaining a dual standard earlier, and the United States then and later, arose because they set the legal ratio at a different level than France, and the French ratio dominated the market ratio at the time.

Personally, I share Frank Fetter's judgment (1973, p. 16) that, "With the hindsight of history, it is amazing that a decision of such importance for

England [the adoption of a single gold standard], and by England's example for an entire world, should have been made without benefit of full analysis, and largely on the basis of details of small coin convenience, and not on larger issues of economic policy. Thus was formally established the gold standard which became effective with the resumption of cash payments in 1821 and survived for 93 years."[20]

Redish's explanation of why gold was adopted rather than silver echoes Jevons: under a silver standard, high-value coins would be excessively heavy and hence inconvenient. Gold could be used for high-value transactions but if gold coins were minted with a face value less than their market value, they would not have circulated at par. If the face value exceeded the market value, gold coins could be kept convertible into silver at their face value by limiting coinage to demand. Such overvalued gold coins would have served the same function that overvalued silver coins and overvalued paper served both then and later. They would of course have been subject to counterfeiting, but the return from doing so would be far less than from counterfeiting paper, and, to judge from Feavearyear's comment, technically more difficult than counterfeiting silver, so it is hard to regard that as a decisive consideration.

Under either gold or silver, or for that matter bimetallism, it is necessary to have small denomination coins. Under a gold standard, full-bodied low-value coins would be excessively small. Redish argues that the British solved that problem by using overvalued silver coins whose convertibility at nominal value was guaranteed by the mint. That could also be done under a silver standard. It was done under the U.S. legal bimetallic but de facto gold standard from 1837 to the Civil War.

Whatever may prove to be the merits of Redish's ingenious rationalization of the British action, it was clearly not a foregone conclusion at the time that resumption would be on gold rather than silver, though it does seem clear that is was largely taken for granted that resumption would be on a monometallic basis. For example, David Ricardo in his pamphlet, *The High Price of Bullion*

[20]Resumption on gold in 1821 did not end the battle of the standards in Britain any more than resumption on gold in 1879 ended the battle of the standards in the U.S. "The most consistent and continuous attacks on the act of 1821 came from supporters of the silver standard or bimetallism" (Fetter, 1973, p. 17). Fetter titles one subsection of his book on monetary orthodoxy "New Support for Bimetallism," referring to reactions to the crisis of 1825; he titles another "Favorable Comments on Silver and Bimetallism," writing (1965, pp. 124, 181), "The last serious Parliamentary move for a silver standard or bimetallism had been in 1835, but in the years between then and 1844 suggestions that silver should have a more permanent place in the monetary system came from many persons of widely diverse views on other aspects of monetary and banking policy." Later still, in the 1870s and 1880s, after resumption on gold by the United States and the shift to gold by France, Germany and other European countries had started a precipitous fall in the gold price of silver, "complications that fluctuations in the Indian exchange were creating for England, the pressure from the United States for bimetallism, and the domestic economic problems resulting from falling gold prices, led to serious consideration of the possibility of international bimetallism... A divided commission [appointed in 1887] recommended bimetallism, but the government did not push the proposal and the movement never got off the ground on the international political level" (Fetter, 1973, p. 19).

([1811] 1951, p. 65), wrote: "No permanent measure of value can be said to exist in any nation while the circulating medium consists of two metals, because they are constantly subject to vary in value with respect to each other . . . . Mr. Locke, Lord Liverpool, and many other writers, have ably considered this subject and have all agreed, that the only remedy for the evils in the currency proceeding from this source, is in making one of the metals only the standard of value."

In re gold versus silver, David Ricardo, in his influential pamphlet, *Proposals for an Economical and Secure Currency*, favored silver, writing ([1816] 1951, p. 63):

> Much inconvenience arises from using two metals as the standard of our money; and it has long been a disputed point whether gold or silver should by law be made the principal or sole standard of money. In favour of gold, it may be said, that its greater value under a smaller bulk eminently qualifies it for the standard in an opulent country; but this very quality subjects it to greater variations of value during periods of war, or extensive commercial discredit, when it is often collected and hoarded, and may be urged as an argument against its use. The only objection to the use of silver, as the standard, is its bulk, which renders it unfit for the large payments required in a wealthy country; but this objection is entirely removed by the substituting of paper money as the general circulation medium of the country. Silver, too, is much more steady in its value, in consequence of its demand and supply being more regular; and as all foreign countries regulate the value of their money by the value of silver, there can be no doubt, that, on the whole, silver is preferable to gold as a standard, and should be permanently adopted for that purpose.

In subsequent testimony of 1819 before a committee of Parliament, Ricardo ([1819a] 1952, pp. 390–91; see also [1819b] 1952, p. 427) shifted to gold because, "I have understood that machinery is particularly apposite to the silver mines and may therefore very much conduce to an increased quantity of that metal and an alteration of its value, while the same cause is not likely to operate upon the value of gold."

Greater stability of value was a valid economic reason for favoring one metal over the other, but the technical prediction that induced Ricardo to decide that gold was likely to be stabler than silver proved erroneous. Silver production fell relative to gold until the discovery of the Comstock Lode in 1860 and machinery came to be at least as applicable to the mining of gold as to the mining of silver. However, the assertion that gold would have a stabler value than silver became a largely self-fulfilling prophecy once gold was chosen as a standard. Britain's choice led to drastic changes in the demand for gold and silver, both then and even more later when other countries followed Britain's example. As a result, silver tended to replace gold in the French

currency until the California and Australia gold discoveries and the real price of gold was far less variable over the next century than the real price of silver. However, if Britain had chosen silver on the expectation that it would have a stabler value, that too would probably have become a self-fulfilling prophecy. Britain's choice of silver would have prevented the subsequent widespread demonetization of silver and instead would have led to either the demonetization of gold or a continuation of effective bimetallism by at least some countries. Either result probably would have meant a stabler real price of silver than of gold, and, if bimetallism had continued, very likely a stabler price level than under either monometallic standard.

It is fascinating to speculate on what "might have been" if Ricardo's technical adviser had informed him that "machinery is particularly apposite to" gold mines rather than silver mines—as indeed it ultimately turned out to be. With Ricardo's immense influence and prestige at the time the key decisions were being made, it is not at all fanciful to suppose that Britain would have resumed on silver instead of gold, transforming the subsequent economic history of the nineteenth century in major ways that we can only dimly see.

As it was, Britain's example and its subsequent rise to economic preeminence proved decisive. It was a major factor leading first Germany and then the United States to adopt a gold standard. Happenstance or not, Britain's decision nearly two centuries ago to resume convertibility on the basis of gold is the fundamental source of the conventional view that gold is superior to silver as the basis for a monometallic standard.

Conclusion

Despite the continued presence among us of "monetary monomaniacs," currently mostly gold bugs, the near universal adoption of inconvertible paper standards throughout the world has rendered the discussion of specie standards, whether gold, silver, bimetallic or symmetallic, of largely historical interest for the nonce. That situation may change but, whether it does or not, it seems worth offering an antidote to the conventional view among monetary economists about bimetallism. Far from being a thoroughly discredited fallacy, bimetallism has much to recommend it on theoretical, practical, and historical grounds as superior to monometallism, though not to symmetallism, or to a tabular standard. Indeed, twentieth-century technological developments have undermined many of the practical considerations that were cited against it during the nineteenth century. In particular, the wider use of deposits and of paper money have rendered almost irrelevant Jevons's concern about the weight of silver compared with gold, as well as the concern of many participants that a bimetallic standard might involve extensive recoinage from time to time. On the other hand, the reduction in the use of coins has undoubtedly weakened the "hard-money" myth that only specie is "real" money. That myth

buttressed earlier popular support for a specie standard and still inspires the gold bugs around the world. When it was much stronger than it is today, it made it politically dangerous to depart from the unlimited convertibility of legal tender into specie, and it still has enough residual power so that central banks around the world continue to carry gold on their books at an artificial "legal monetary price."

As a final note, we have here a striking example of how far-reaching can be the unintended effects of an event that is almost a matter of chance. In this case the pebble that started an avalanche was Britain's decision to resume convertibility on the basis of gold. The economic history of the world ever since would have been very different if Britain had chosen instead to retain bimetallism, or to resume convertibility on the basis of silver, though it surpasses our analytical ability to sketch in detail just how events would have evolved.

■ *I am indebted for helpful comments on earlier drafts to Angela Redish, Hugh Rockoff, and Anna J. Schwartz. In addition, the present version has benefited greatly from detailed comments by the editors.*

References

Bagehot, Walter, *Some Articles on the Depreciation of Silver and on Topics Connected with It.* London: H. S. King & Co., 1877. Reprinted in Morgan, Forrest, ed., *The Works of Walter Bagehot*, vol. 5. Hartford: The Travelers Insurance Co., 1891.

Culbertson, John M., *Macroeconomic Theory and Stabilization Policy*. New York: McGraw-Hill, 1968.

Edgeworth, Francis Y., "Thoughts on Monetary Reform," *Economic Journal*, September 1895, *5*, 434–51.

Feavearyear, Albert, *The Pound Sterling*. 2d ed., revised by E. Victor Morgan. Oxford: The Clarendon Press, 1963.

Fetter, Frank W., *Development of British Monetary Orthodoxy, 1797–1875*. Cambridge: Harvard University Press, 1965.

Fetter, Frank W., "Monetary Policy." In Fetter, Frank W., and Derek Gregory, eds., *Monetary and Financial Policy*. Dublin: Irish University Press, 1973.

Fisher, Irving, "The Mechanics of Bimetallism," *Economic Journal*, September 1894, *4*, 527–37.

Fisher, Irving, *The Purchasing Power of Money*. New York: Macmillan, 1911. 2d ed., New York: Macmillan, 1913.

Friedman, Milton, "Monetary Policy in a Fiat World," *Bank of Japan Monetary and Economic Studies*, September 1985, *3*, 11–18.

Friedman, Milton, "The Crime of 1873," *Journal of Political Economy*, forthcoming, 1990.

Friedman, Milton, and Anna J. Schwartz, *A Monetary History of the United States, 1867–1960*. Princeton: Princeton University Press, 1963.

Giffen, Sir Robert, *The Case Against Bimetallism*. London: G. Bell & Son, 1892. 4th ed., London: George Bell & Sons, 1896.

Hamilton, Alexander. "Treasury Report on the Establishment of a Mint," January 28, 1791. Reprinted in Krooss, Herman E., ed., *Documentary History of Banking and Currency in the United States*, vol. 1. New York: Chelsea House Publishers, 1969.

Hughes, Jonathan, *American Economic History*, 2d ed. Glenview, Ill.: Scott, Foresman & Co., 1987.

Jevons, William Stanley, *The Coal Question*. London: Macmillan & Co., 1865.

Jevons, William Stanley, *Money and the Mechanism of Exchange*. London: H. S. King &

Co., 1875. 9th ed., London: Kegan Paul, Trench, Trübner & Co., Ltd., 1809.

Jevons, William Stanley, *Investigations in Currency and Finance*. Foxwell, H.S., ed., published posthumously. London: Macmillan & Co., 1884.

Laughlin, James Laurence, *The History of Bimetallism in the United States*. New York: D. Appleton, 1885.

Marshall, Alfred, *Official Papers*. London: Macmillan & Co., 1926.

Martin, David A., "The Impact of Mid-Nineteenth Century Gold Depreciation upon Western Monetary Standards," *Journal of European Economic History*, Winter 1977, *6*, 641–58.

Mises, Ludwig von, *The Theory of Money and Credit*. Translated by H. E. Batson. New Haven: Yale University Press, 1953.

Nicholson, J. Shield, *A Treatise on Money*. Edinburgh and London: W. Blackwood & Sons, 1888. 3d ed., London: Adam and Charles Black, 1895.

Redish, Angela, "The Evolution of the Gold Standard in England," Discussion Paper no. 88-36, University of British Columbia, Department of Economics, December 1988.

Ricardo, David, *The High Price of Bullion*, 4th ed., corrected. London: John Murray, 1811. Reprinted in Sraffa, Piero, ed., *The Works and Correspondence of David Ricardo, vol. 3: Pamphlets and Papers, 1809–1811*. Cambridge: University Press (for the Royal Economic Society), 1951.

Ricardo, David, *Proposals for An Economical and Secure Currency*, 2d ed. London: John Murray, 1816. Reprinted in Sraffa, Piero, ed., *The Works and Correspondence of David Ricardo, vol. 4: Pamphlets and Papers, 1815–1823*. Cambridge: University Press (for the Royal Economic Society), 1951.

Ricardo, David, "Minutes of Evidence Taken before the Secret Committee on the Expediency of the Bank Resuming Cash Payments," March 4, 1819*a*. Reprinted in Sraffa, Piero, ed., *The Works and Correspondence of David Ricardo, vol. 5: Speeches and Evidence*. Cambridge: University Press (for the Royal Economic Society), 1952.

Ricardo, David, "Minutes of Evidence Taken before the Lords Committees Appointed a Secret Committee to Enquire into the State of the Bank of England, with Reference to the Expediency of the Resumption of Cash Payments at the Period Now Fixed by Law," March 24, 1819*b*. Reprinted in Sraffa, Piero, ed., *The Works and Correspondence of David Ricardo, vol. 5: Speeches and Evidence*. Cambridge: University Press (for the Royal Economic Society), 1952.

Saint Marc, Michele, *Histoire Monetaire de la France, 1800–1980*. Paris: Presses Universitaires de France, 1983.

Schumpeter, Joseph A., *History of Economic Analysis*, Schumpeter, Elizabeth Boody, ed. New York: Oxford University Press, 1954.

Walker, Francis A., "The Free Coinage of Silver," *Journal of Political Economy*, March 1893, *1*, 163–78.

Walker, Francis A., "Address on International Bimetallism," Schoolmasters' Club of Massachusetts, Boston, November 7, 1896*a*. In Dewey, Davis R., ed., *Discussions in Economics and Statistics*, vol. 1. New York: Holt, 1899.

Walker, Francis A., *International Bimetallism*. New York: Holt, 1896*b*.

Walras, Leon, *Elements of Pure Economics*. Translated by William Jaffié Homewood, Ill.: Irwin, 1954.

Warren, George F., and Pearson, Frank A., *Prices*. New York: Wiley, 1933.

White, Andrew Dickson, *Fiat Money and Inflation in France*. New York: Appleton and Co., 1896.