

38. Mill, J. S. *Principles of Political Economy*. Ashley edition. London: Longmans, Green and Company, 1909.
39. Mints, L. *A History of Banking Theory*. Chicago: University of Chicago Press, 1945.
40. Modigliani, F. "Liquidity Preference and the Theory of Interest and Money," in *Critics of Keynesian Economics*, edited by H. Hazlitt. New York: Van Nostrand, 1960.
41. Nichans, J. *The Theory of Money*. Baltimore: Johns Hopkins University Press, 1978.
42. O'Brien, D. P. *The Classical Economists*. Oxford: Clarendon Press, 1975.
43. Patinkin, D. *Money, Interest and Prices*. New York: Harper and Row, 1965.
44. ———. *Studies in Monetary Economics*. New York: Harper and Row, 1965.
45. Peck, B. P. and T. R. Saving. *Money, Wealth and Economic Theory*. New York: Macmillan, 1967.
46. Petrella, F. "Adam Smith's Rejection of Hume's Price-Specie-Flow Mechanism: A Minor Mystery Resolved." *Southern Economic Journal*, January 1968, 365-74.
47. Phillips, C. A. *Bank Credit*. New York: Macmillan, 1920.
48. Ricardo, D. *The Principles of Political Economy*. Volume 1, *The Works and Correspondence of David Ricardo*, edited by P. Sraffa. Cambridge, England: Cambridge University Press, 1951.
49. ———. "The High Price of Bullion," in Volume 3, *The Works and Correspondence of David Ricardo*, edited by P. Sraffa. Cambridge, England: Cambridge University Press, 1951, 47-127.
50. Robbins, L. *Robert Torrens and the Evolution of Classical Economics*. London: Macmillan, 1958.
51. ———. *Political Economy Past and Present*. New York: Columbia University Press, 1976.
52. Rueff, J. "The Fallacies of Lord Keynes' General Theory." *Quarterly Journal of Economics*, May 1947, 343-67.
53. Samuelson, P. A., "D. H. Robertson (1890-1963)." *Quarterly Journal of Economics*, November 1963, 517-36.
54. ———, "What Classical and Neo-classical Monetary Theory Really Was." *Canadian Journal of Economics*, February 1968, 1-15.
55. Schumpeter, J. *The History of Economic Analysis*. New York: Oxford University Press, 1954.
56. Senior, N. *Three Lectures on the Value of Money*, reprinted in *Selected Writings on Economics: A Volume of Pamphlets 1827-52* by N. Senior. New York: Augustus M. Kelley, 1960.
57. Shackle, G. L. S. *The Years of High Theory*. Cambridge, England: Cambridge University Press, 1967.
58. Smith, A. *The Wealth of Nations*. New York: Modern Library, 1937.
59. ———. *Lectures on Jurisprudence*. Oxford: The Clarendon Press, 1978.
60. Sowell, T. *Say's Law: An Historical Analysis*. Princeton: Princeton University Press, 1972.
61. ———. *Classical Economics Reconsidered*. Princeton: Princeton University Press, 1974.
62. Thompson, E. A. "The Theory of Money and Income Consistent with Orthodox Value Theory," in *Trade, Stability, and Macroeconomics*, edited by G. Horwich and P. A. Samuelson. New York: Academic Press, 1974.
63. ———. "Free Banking Under a Labor Standard." Statement to the U.S. Gold Commission, November 1981.
64. Thornton, Henry. *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain*. London: G. Allen and Unwin, Ltd., 1939.
65. Tobin, J. "Commercial Banks as Creators of Money," in *Banking and Monetary Studies*, edited by D. Carson. Homewood, Ill.: R. D. Irwin, 1963.
66. U.S. Gold Commission. *Report to the Congress of the Commission on the Role of Gold in the Domestic and International Monetary Systems*. Washington: The Commission, 1982.
67. Viner, J. *Studies in the Theory of International Trade*. New York: Harper and Brothers, 1937.
68. White, L. H. *Free Banking in Britain: Theory, Experience, Debate 1800-1845*. New York: Cambridge University Press, 1984.
69. Wickseil, K. *Lectures on Political Economy*, Volume 2, London: G. Routledge and Sons, Ltd., 1935.

[12]

The Bullionist Controversy Revisited

Morris Perlman

London School of Economics

The debate between Ricardo and Thornton and Malthus about the causes of balance of trade deficits is reexamined. It is argued that, given the state of real trade theory in the period, the debate could not have been resolved. With the discovery of the principle of comparative advantage Ricardo changed the views he had expressed during the controversy and implicitly repudiated the arguments he had used against Thornton and Malthus.

Over the years the bullionist controversy has evoked great interest among historians of monetary theory.¹ This is not surprising. In the 15 years following the suspension of convertibility in 1797, some of the most important issues in monetary theory were debated by the greatest economists of the time. To most theoretically oriented historians, the most interesting debate during the period was not that between the bullionists and the antibullionists; rather it was the debate among different members of the bullionist camp.

David Ricardo, the hard-line bullionist, argued that a necessary and sufficient condition for a balance of trade deficit was a redundant currency. With convertibility this would lead to an outflow of gold; with inconvertibility it would lead to a change in the exchange rate. Henry Thornton and Robert Malthus agreed with Ricardo that an excess issue of currency would result in a balance of trade deficit, but they also believed that such a deficit could occur because of changes in

I would like to thank Mark Blaug and D. O'Brien for helpful comments.

¹ It is not my intention to survey this voluminous literature. For issues somewhat related to those presented here, see Viner (1937), Fetter (1942), Sayers (1953), Mason (1957), Grubel (1961), and, particularly on Thornton, Reisman (1971) and Peake (1978).

Journal of Political Economy, 1986, vol. 94, no. 4
© 1986 by The University of Chicago. All rights reserved. 0022-3808/86/9404-0007\$01.50

the real sector of the economy. Thornton argued that a bad harvest and changes in taste for the country's commodity could lead to a balance of trade deficit. Malthus agreed and staunchly defended Thornton against Ricardo's criticisms.

The judgment of most historians of thought on this debate is that Ricardo, in his usual fashion, was concerned only with long-run equilibrium and ignored short-run adjustment problems (Viner 1937, p. 140; Sayers 1953, pp. 93-94). They feel that Ricardo was so intent on presenting the dangers of overissue that he did not want to muddy the waters by bringing in other matters. If one takes this view of the controversy, one is left with a feeling of anticlimax: Ricardo was right in the long run, but the others were right in the short run.

Though there may be an element of truth in this judgment, I believe that it too easily ignores the theoretical problems involved in the controversy and the theoretical puzzles with which the participants had to struggle. The issues involved in the controversy were much more fundamental than the short-run/long-run distinction. I shall argue, moreover, that the controversy could not have been resolved at the time. The theory necessary to resolve it was not available. None of the participants had a sufficiently good real theory of the determination of international relative prices to resolve a controversy that was, after all, about the effects of real changes on exchange rates.² I shall also argue that 5 years or so later, when Ricardo had discovered the theory of comparative advantage, his views changed fundamentally. His statements in the *Principles* (1821/1951b) contrast dramatically with those in *The High Price of Bullion* (1810/1951a).

To reexamine the controversy, I first consider Thornton's position in Section I. In Section II, I consider Ricardo's criticism of Thornton and his reply to Malthus's (1811) defense of Thornton. In Section III, I consider Ricardo's position in the *Principles* and show how his views had changed. In Section IV, I reconsider the problem of finding a correct measure of depreciation.

I. Thornton

In chapter 5 of *Paper Credit* (1802/1939), Thornton considers the effects of changes in the balance of trade on the domestic economy and the policy implications of such changes. As it was a passage in this analysis that evoked Ricardo's criticism and later brought Malthus to Thornton's defense, I shall examine Thornton's theory in detail. Moreover, it was probably the most sophisticated theory of the bal-

² By "real" theory I mean a theory that explains the determination of international relative prices by real factors, i.e., tastes, technology, and endowments.

ance of trade of the period. With the addition of a theory of international relative prices (not available at the time) and some minor modifications, it was a theory that modern theorists would be quite happy to accept.

To avoid some of the complications and misunderstanding generated during the controversy and later in interpretations of Thornton's position, one point has to be stressed. Thornton analyzed the problem facing the Bank of England in three different chapters of *Paper Credit*. He quite logically distinguishes between an internal drain, a balance of trade problem, and the problem arising from a "too great emission" of paper. He states this explicitly in chapter 5, which contains the statement that evoked Ricardo's criticism: "In the former Chapter, the difficulties which the bank experiences in consequence of a run occasioned by an alarm, were chiefly considered; in the present, the difficulties arising from that sort of drain which proceeds from an unfavourable balance of trade are investigated. In some future Chapters, the difficulties to which the bank is exposed by a similar drain, resulting from a too great emission of paper, will be the subject of examination" (p. 150n). Thornton here, and in his later analysis, distinguishes quite clearly between balance of trade problems, which I shall argue mean problems arising from real changes, and monetary problems, those arising from an overissue of paper money.

Thornton starts with a general principle:

It may be laid down as a general truth, that the commercial exports and imports of a state . . . naturally proportion themselves in some degree to each other; and that the balance of trade . . . cannot continue for a very long time to be either highly favourable or highly unfavourable to a country. For that balance must be paid in bullion, or else must constitute a debt. To suppose a very great balance to be paid, year after year, in bullion, is to assume such a diminution of bullion in one country, and such an accumulation of it in another, as are not easy to be imagined. . . . To suppose large and successive balances to be formed into a debt, is to assume an accumulation of debt, which is almost equally incredible. [Pp. 141-42; emphasis added]

How then is equilibrium between commercial exports and imports achieved?

The equalization of the commercial exports and imports is promoted not only by the unwillingness of the richer state to

lend to an unlimited extent, but also by a disinclination to borrow in the poorer. There is in the mass of the people . . . a disposition to adapt their individual expenditure to their income. . . . The income of individuals is the general limit in all cases. . . . And this equality between private expenditures and private incomes tends ultimately to produce equality between the commercial exports and imports. [Pp. 143-44]

For different reasons both the passages above are striking. The first is noteworthy because of the omission of any reference to the price level. Thornton was well aware of David Hume's (1752/1903) specie flow mechanism. With minor criticisms, he mentions Hume approvingly in chapter 11. Moreover, he himself uses the Humean analysis in later chapters. For example, in chapter 8 he argues how a rise in the price of goods in one country will affect both imports and exports "for the high British price of goods will tempt foreign commodities to come in nearly in the same degree in which it will discourage British articles from going out" (p. 198). It could have been so easy for Thornton to add after the emphasized phrase in the first passage quoted above something like "since every diminution of bullion will produce an augmentation of it abroad, the relative value of gold to goods in the two countries would soon find one general level. These effects will tend to bring the balance of trade back into equilibrium."³ Yet he avoids any mention of prices.

It seems clear that in this part of his analysis Thornton was groping for what we would now call a real theory of the balance of trade, studiously avoiding any adjustment processes that depended on monetary changes and, through these, on price changes. As is shown by the second passage quoted, his groping was amazingly successful.

Though this passage may not seem striking to a modern general equilibrium theorist, it is quite exceptional when we remember that it was written in 1802. From individual budget constraints, Thornton deduces that a balance of trade deficit implies a desire to decumulate wealth. This can occur either by running down gold hoardings or by borrowing from abroad. Thus equality between desired expenditures and income implies a balance of trade equilibrium. A balance of trade problem occurs when desired expenditures are greater than income, which implies that individuals want to decumulate wealth. Thornton then argues that for various reasons individuals would not want to run down their wealth continuously, and therefore the balance of trade would be in equilibrium. For this analysis, the price level effects

³ This is a paraphrase of a statement from one of his speeches (Thornton 1939, p. 331).

of changes in the quantity of gold are not material. Gold is considered only as a form of wealth that is easily convertible into goods, not in its form as money and its effects on the price level.

This interpretation of the passage is not made with theoretical hindsight. In a brilliant footnote appended to this discussion, Thornton considers a subsidy to a foreign power and government expenditures to maintain an army abroad. That such expenditures would lead to a gold outflow under a fixed exchange rate or to changes in the exchange rate with flexible exchange rates was a common argument during the period. But Thornton did not make the simplistic argument that concentrates on the gold given as a subsidy. He concentrates on the goods market and the effects of the subsidy in a general equilibrium context.

The reason why the subsidy will lead to a balance of trade deficit is that, to pay for the subsidy, "Great Britain is laid under a necessity of exporting two millions, either of goods or of bullion, or of both, for which no foreign commodities will be given in return. These . . . exports diminish our fund of exportable goods. . . . They tend . . . to reduce the quantity of goods which can be exported by us in the way of ordinary commerce, and to turn the balance of trade against us" (p. 144n). Thus, even if the whole subsidy were used to purchase British goods, it would still affect the balance of trade.

Moreover, and even more indicative of his real approach in this chapter, Thornton brilliantly extends this argument to government expenditures to maintain an army *at home*. "It may be added, that articles consumed at home, in the support of similar fleets and armies, as well as all other expenditure in Great Britain, must have the same general tendency" (p. 144n). He goes on to argue, therefore, that, if the expenditures on the army abroad produce greater savings in expenditures on an army at home, the net effect may be an improvement in the balance of trade. This argument is perfectly consistent with his previous real analysis, in which an excess demand for commodities implies a balance of trade deficit. For this conclusion, it is immaterial whether the excess demand for commodities occurs because of an increase in individuals' desired expenditures relative to their income or an increase in the government's desired expenditures. Though his actual argument here may be wrong because he did not take into account the effects of the financing of the subsidy or of the expenditure on the army at home on the budget constraints of individuals, that would have been too much to ask of him.⁴

⁴ If the increased government expenditures are matched by a decrease in private expenditures, they would not lead to a balance of trade problem. See App. A for a more detailed analysis of his theory.

Up to this point Thornton's analysis is unobjectionable. It is when he moves from the long run to the short run that he gets into difficulties and provokes Ricardo's objections.

But though the value of . . . exports and imports . . . will have this general tendency to proportion themselves to each other, there will not fail occasionally to arise a very great inequality between them. A good or a bad harvest, in particular, will have a considerable influence in producing this temporary difference. . . . If the harvest fails, and imports are necessary, in order to supply the deficiency, payment for those imports is almost immediately required: but the means of payment are to be supplied more gradually through the limitation of private expenditure, or the increase of individual industry. [P. 143]

A deficit of this sort could be understood in terms of a permanent income hypothesis of consumption but is not consistent with his initial position about the relationship between the balance of trade and expenditures and income. The issue here is not one between short- and long-run effects in terms of lags or adjustment problems. The equality between expenditure and income arises from individual budget constraints and is a proposition about the effectiveness of the relevantly specified budget constraint. Of course, if current consumption is a function of some concept of permanent income, a bad harvest (a transitory change in income) will not reduce consumption by the full amount but may result in a desire to run down wealth to maintain consumption at its present level. And as Thornton had argued previously, such a decumulation of wealth would result in a balance of trade deficit. This results in an outflow of gold if the decumulation of wealth is achieved by running down gold holdings. If it is done by borrowing from abroad, there is a balance of trade deficit without any gold outflows.

Whether this was what Thornton had in mind here is hard to say, but at least this interpretation is consistent with his previously specified (real) theory of the balance of trade. However, after a detour into a slightly confused analysis of the relationship between the market and mint price of gold, he returns to the short-run case.

At the time of a very unfavourable balance (produced, for example, through a failure of the harvest), a country has occasion for large supplies of corn from abroad: but either it has not the means of supplying at the instant a sufficient quantity of goods in return, or, which is much the more

probable case, and the case which I suppose more applicable to England, the goods which the country . . . is able to furnish as means of cancelling its debt, are not in such demand abroad as to afford the prospect of a tempting or even of a tolerable price; and this want of a demand may happen possibly through some political circumstance which has produced . . . the temporary interruption of an established branch of commerce. [P. 151]

In such a case gold, which is always acceptable, will be used to finance the imbalance of trade.

Thornton's analysis here is quite different from his previous analysis of the bad harvest, in which the deficit arises because a fall in output (the bad harvest) is not accompanied by a fall in demand. There is thus an excess demand for goods, and the other side of the coin is a balance of trade deficit. In the case described above, there is an excess supply of goods. People want to sell goods abroad but cannot do so because of the fall in the demand for exports arising "possibly because of some political circumstance."

This case is, of course, much more difficult to analyze. It is a case of disequilibrium in which the country is accumulating unwanted inventories of goods that it cannot export. To analyze it, one would need to specify some adjustment process arising from the disequilibrium. Had there at that time been a theory of the determination of international relative prices, one could postulate that the excess supply of domestic commodities would result in some change in relative prices that might eliminate it in the short or long run, depending on the speed of adjustment. However, all the participants in the controversy at that time were still working with international trade theory based on absolute advantage. Adam Smith was still the authority on international trade. And in Smith there is no analysis of what determines international relative prices.

II. Ricardo

Thornton's analysis of the bad harvest evoked Ricardo's disapproval. Ricardo opens his *High Price of Bullion* (1951a) with the following statement:

The precious metals employed for circulating the commodities of the world . . . have been supposed by the most approved writers on political economy to have been divided . . . among . . . nations . . . according to the state of their commerce and wealth, and therefore according to the num-

ber and frequency of the payments which they had to perform. *While so divided they preserved every where the same value, and . . . there could be no temptation offered . . . for their importation or exportation.* [P. 52; emphasis added]

The rest of the essay is a brilliant elaboration of this thesis, taking account of the existence of a bank of issue and incorporating the case of nonconvertibility and thus flexible exchange rates to the conclusion at which the whole essay is directed: "In this view of the subject, then, it appears, that the temptation to export money in exchange for goods, or what is termed an unfavourable balance of trade, *never arises but from a redundant currency*" (p. 59; emphasis added).

After elaborating his thesis, Ricardo turns on the passage in Thornton in which the analysis of the bad harvest was presented (quoted above):

Mr. Thornton has not explained to us, why any unwillingness should exist in the foreign country to receive our goods in exchange for their corn; and it would be necessary for him to show, that if such an unwillingness were to exist, we should agree to indulge it so far as to consent to part with our coin.

. . . We should not import more goods than we export, unless we had a redundancy of currency, which it therefore suits us to make a part of our exports. . . . We should not export it, if we did not send it to a better market, or if we had any commodity which we could export more profitably. [P. 61]

At this point, Ricardo brings in the argument from self-interest, which he also later used so effectively with Malthus:

It resolves itself entirely into a question of interest. . . .

It is only after a comparison of the value in their markets and in our own, of gold and other commodities, and because gold is cheaper in the London market than in theirs, that foreigners prefer gold in exchange for their corn. . . . If I owed a debt in Hamburgh of 100*l.* I should endeavour to find out the cheapest mode of paying it. If I send money, the expence attending its transportation being I will suppose 5*l.* to discharge my debt will cost me 105*l.* If I purchase cloth here, which, with the expences attending its exportation, will cost me 106*l.* and which will, in Hamburgh, sell for 100*l.* it is evidently more to my advantage to send the money. If the

purchase and expences of sending hardware to pay my debt, will take 107*l.* I should prefer sending cloth to hardware, but I would send neither in preference to money, because money would be the cheapest exportable commodity in the London market. [P. 62]

This argument from self-interest and the comparisons that are supposedly made to determine which commodity to use to pay off a foreign debt are not valid and, as I shall show below, were rejected by Ricardo himself in the *Principles*.

Comparing the prices of individual commodities across countries will always give the same result, namely, that their prices are identical, and thus their values in terms of gold are also identical. If we ignore transport costs, the price of an English exportable in England will be the same as its price in, say, Holland when the appropriate exchange rate calculation is made. Similarly, the price of an English importable from Holland will be the same as its price in Holland. For this result to hold, all we require is the proposition that the prices of the same commodity cannot differ in two markets except for transport costs and taxes, a proposition generally accepted in classical theory.⁵ This result will hold whatever happens to the quantity of money and therefore the price level in any one country. If the quantity of money increases in England and therefore the prices of English exportables rise, their prices will also rise in Holland. An increase in the quantity of money in England will change the relative price of an English commodity and an identical Dutch commodity only if the commodity is not traded. But in this case by definition it cannot be used to pay off the debt in Holland.

This stress on the comparisons of the value of gold in the two countries stems directly from Ricardo's specification of the law governing the distribution of specie among countries, where he stresses that the precious metals will be so distributed that "they preserve everywhere the same value."⁶ However, comparing the value of gold in terms of any traded commodity across countries will always yield the same result whatever happens to the price level and whatever is the distribution of specie across countries. Differences arise only from the existence of transport costs or taxes.

In reply to Malthus's (1811) criticisms, Ricardo again uses the argument from self-interest based on a comparison of the prices of com-

⁵ See Viner (1937, p. 384). For this result, gold movements are neither necessary nor sufficient.

⁶ In Hume's (1903, p. 322) formulation of this law there is, quite correctly, no mention of equality in the value of gold.

modities across countries. Now, however, he has obviously considered the possibility of the response that the prices of commodities will be the same in the two countries, and he turns to counter this potential criticism.

I may . . . be told that the Reviewer's supposition is not that coffee, sugar . . . &c. &c. are cheaper than money, but that these commodities and money are equally cheap in both countries. . . . If the value of all these commodities were so nicely poised, what would determine an exporter to send the one in preference to the other . . . ? If he sends money, . . . we are told by the Reviewer that money would on account of its increasing quantity in France, and its decreasing quantity in England, become cheaper in France than in England, and would be re-imported in exchange for goods. . . . But would not the same effects take place if coffee or any of the other commodities were exported, whilst they were equally valuable in relation to money in both countries? Would not the equilibrium between supply and demand be destroyed, and would not the diminished value of coffee, &c. in consequence of their increased quantity in France, and their increased value in England, from their diminished quantity, produce their re-importation into England? [P. 105]

There are two answers to Ricardo's questions in this passage. The first, at the simplest level, is that, when all commodities are equally cheap, a debt will be paid in the form of money because money is the medium of exchange that is equally acceptable in all countries for all transactions. Thus, if I owe 100 francs in France, it is true that I could pay it by shipping any commodity, selling it in France for francs, and paying off my debt. I shall ship money, however, because it is directly acceptable without my first having to exchange a commodity for it.

However, added to this "institutional" answer there is a more basic answer. Money is fundamentally different from other commodities because its price in terms of currency is fixed in both countries. Ricardo is discussing a case of convertibility. Suppose someone does decide to pay a debt in the form of a commodity when the price of that commodity is the same in the two markets, and both markets are in equilibrium. As Ricardo quite rightly points out, this would result in an excess supply in that market. There would be a tendency for the price to fall there, and therefore the commodity will not be shipped there. This is not so with gold. The price of gold is fixed in both markets by the respective central banks. If the debt is paid in gold, the price of gold does not change in either market; in both there is a

perfectly elastic supply and demand curve for gold at the fixed price. The individual can continue paying his debt in the form of gold without affecting the price of gold. It may be true that, as the quantity of gold increases in one country and decreases in the other, the price level will change and thus relative prices of commodities will change. This will not, however, make it any less or more costly to pay the debt in the form of gold. If 10 ounces of gold were sufficient to pay my debt in francs before these changes, 10 ounces of gold will still be sufficient to pay my debt after the changes, and the cost to me of those 10 ounces will still be the same. The debt is in the form of money and is fixed at so many francs. It is not in terms of commodities.

III. Ricardo's "Principles"

In his chapter on "Foreign Trade," Ricardo restates the law of the allocation of specie among countries: "they are . . . distributed in such proportion amongst the different countries of the world, as to accommodate themselves to the natural traffic which would take place if no such metals existed, and the trade between countries were purely a trade of barter" (1951*b*, p. 137).

It is interesting to compare this statement of the law governing the distribution of specie with the statement made in the *High Price of Bullion* quoted above. There are two significant differences. The first is that, now that Ricardo had discovered a real theory of the determination of international relative prices, the monetary side had to adjust to be consistent with the real side. In fact, Ricardo himself gives an example of a real change that results in monetary flows. He analyzes the case of a change in comparative advantage in the production of wine and cloth, which results in gold flows, and concludes "that the improvement of a manufacture in any country tends to alter the distribution of the precious metals amongst the nations of the world" (p. 141).

Consider now the debate that had taken place 5 years or so earlier. Ricardo had then argued that "an unfavourable balance of trade never arises but from a redundant currency" (1951*a*, p. 59). How could he respond if confronted with his own example from the *Principles*? He could, of course, still maintain his position, given the way he defined a redundant currency as being any amount in excess of what it would have been under a gold standard. Thus he could argue that, in his example in the *Principles*, the change in comparative advantage would, under a gold standard, lead to a flow of money. Therefore, if no such change in the quantity of money occurs, there is a redundant currency. However, if that were the response, the participants could agree to a verbal difference. When discussing the excess of the market

price of gold over the mint price (the measure used for depreciation). Thornton had explicitly stated that "this excess, if it arises on the occasion of an unfavourable balance of trade, and at a time when there has been no extraordinary emission of notes, may fairly be considered as an excess created by that unfavourable balance, though it is one which a *reduction of notes tends to cure*" (1939, p. 151; emphasis added). Ricardo would then have to agree that the cause, in the sense of the initiating exogenous change, in his example in the *Principles*, was the change in comparative advantage that led to the effect of a redundant currency.

Consider now the questions that were actually debated in the previous period, namely, the effects of a bad harvest and of a change in tastes for commodities. Will these events result in gold flows or exchange rate changes? According to the law for the allocation of specie among nations as laid down in the *Principles*, the question can be restated as follows: Will a bad harvest or a change in tastes affect "the natural traffic which would take place" if trade "were purely a trade of barter"? Or, alternatively, using more modern terminology, would such changes result in a change in international relative prices? If the answer is yes, then they would lead to either monetary flows or changes in the exchange rate. If the answer is no, then they would not.

It is, of course, not clear that even posed in this way the question could have been resolved within the framework of Ricardo's comparative advantage theory. Comparative advantage only set the limits within which relative prices would fall. The effects of a change in tastes on relative international prices could probably not have been rigorously resolved until John Stuart Mill's development of reciprocal demand. But at least if the question would have been put within the framework of Ricardo's theory of international specie allocation as stated in the *Principles*, the debate would have shifted to the real sector, where its resolution lay.

There is another major difference between Ricardo's statement about the allocation of specie in the *Principles* and that in the *High Price of Bullion*. In the latter, Ricardo had added "while so divided they preserved every where the same value, and . . . there could be no temptation offered . . . for their importation or exportation" (1951a, p. 52). This particular point was immensely important in all Ricardo's arguments with Thornton and Malthus. His arguments from self-interest and his various numerical examples were all based on this equality in the value of specie across countries. Yet this is completely absent from the *Principles*. Moreover, in the *Principles* he explicitly rejects this argument: "the value of [specie] money is never the same in any two countries" (p. 143). "In speaking of the exchange and the

comparative value of money in different countries, we must not in the least refer to the value of money estimated in commodities, in either country. The exchange is never ascertained by estimating the comparative value of money in corn, cloth, or any commodity whatever, but by estimating the value of the currency of one country, in the currency of another" (p. 147). "Those who maintain that our currency was depreciated . . . never contended . . . that money could not be more valuable in one country than another, as compared with various commodities" (p. 148).

With this view, how could Ricardo have argued, as he did in his reply to Malthus and his criticism of Thornton, that by comparing the value of money in terms of different commodities we can determine when it would be in the self-interest of individuals to pay their debt in the form of gold?

IV. The Measure of Depreciation

All the bullionists agreed that one measure of depreciation was the market price of gold relative to the mint price, the price fixed by the central bank under convertibility. The argument for this was, briefly, that as soon as a country stopped convertibility the precious metals became just another commodity. If there was an overissue of currency, all prices, including the price of the precious metals, would rise, and thus their market prices would rise relative to the fixed mint price. Ricardo went further than the others and also argued that the exchange rate could be used also as a measure of depreciation. Given his views that changes in the exchange rate could occur only when there was overissue, he argued that "the exchange will, therefore, be a tolerably accurate criterion by which we may judge the debasement of the currency, proceeding either from a clipped coinage, or a depreciated paper-money" (1951a, p. 72).

In considering this question, nearly all the participants in the debate seemed to have a blind spot that affected their analysis. If one country stops convertibility, the metal, say gold, does not become like any other commodity as long as some other country continues with convertibility into that metal. The price of the metal is then fixed in the other country in terms of that country's currency. Its price in this country is its price fixed in the other country's currency adjusted for the exchange rate. Any change in the exchange rate will lead to a change in the price of that metal, and *only* a change in the exchange rate will do so.⁷ If the change in the exchange rate occurs only because of overissue of currency, then it will be true that the change in the

⁷ I am ignoring transport costs.

market price of gold relative to its bullion price is a measure of overissue. However, if the exchange rate can change for other reasons, as was argued by both Thornton and Malthus, then there will still be a change in the market price of gold relative to its mint price, but this change will be due not to an overissue of currency but to whatever real factor changed the exchange rate. Thus the use of either of these measures requires the supposition that the exchange rate can change only because of an overissue of currency, a supposition that was rejected by both Malthus and Thornton. How then could one measure the degree of depreciation?

Curiously, it was Ricardo himself who, in a different context, found the correct solution. In discussing the high price of gold, he argues that it is not gold that has changed its value, but paper currency. To prove this he proposes the conceptual experiment of comparing the value of gold in terms of commodities with the value of currency in terms of commodities:

Compare an ounce of gold . . . to commodities, it bears the same proportion to them which it has before done; and if it do not, it is referrible to increased taxation, or to some of those causes which are so constantly operating on its value. But if we compare the substitute of an ounce of gold 3*l.* 17*s.* 10½*d.* in bank-notes, with commodities, we shall then discover the depreciation of the bank-notes. In every market of the world I am obliged to part with 4*l.* 10*s.* in bank-notes to purchase the same quantity of commodities which I can obtain for the gold that is in 3*l.* 17*s.* 10½*d.* of coin. [1951*a*, p. 80]

This test, of considering the value of gold in terms of commodities, is also the one that would show us whether the high price of gold is due to a change in the real sector of the economy that resulted in a change in the exchange rate and therefore in the price of gold or to a monetary change that also resulted in a change in the exchange rate and therefore in the price of gold.

Consider a pure monetary change that changes the price level and therefore the exchange rate by 10 percent. The change in the exchange rate by 10 percent will also change the market price of gold by 10 percent. As I argued above, the market price of gold in this country is equal to its fixed price in the other country, which is still maintaining convertibility, adjusted by the exchange rate. This change will leave the value of gold in terms of commodities unchanged. Both would have changed by 10 percent. However, assume that there has been a real change, for example, a change in tastes for this country's

commodities or a bad harvest, which also changes the exchange rate by 10 percent. The market price of gold will as before also change by 10 percent, but the price of other commodities will remain unchanged or will change in different proportion. The value of gold in terms of the other commodities will thus change.⁸

V. Conclusion

The bullionist controversy has been interpreted as the first in many monetary controversies in which the basic issues concerned the speed of adjustment of the real economy to exogenous shocks of one sort or another. The difference among the participants was mainly their view of the short-run flexibility of the economic system to such shocks. In these controversies one can always reconcile the two sides by arguing that one is concerned with short-run and the other with long-run equilibrium, though usually the former group does not think that the latter solution is of much interest. Though there was an element of this in the bullionist controversy, especially in relation to policy issues, there was a fundamentally difficult theoretical problem that had to be resolved before the participants could resolve their differences or even agree to disagree on the short-run/long-run split. Moreover, I have also argued that, given the state of real trade theory at the time of the controversy, it could not have been resolved. The controversy was about the effects of real changes on the system, and none of the participants had an explicit theory about how these real changes would affect relative international prices.

Appendix A

Thornton's Model

$$E_p = (Y - T) + \alpha(w - \bar{w}). \quad (A1)$$

In (A1) E_p is private expenditure, Y is output, T is taxes, $(w - \bar{w})$ is the difference between actual and desired wealth, and $\alpha \leq 1$ is some adjustment coefficient. The equation represents the proposition that the demand for commodities by the private sector is equal to its income plus some proportion of the difference between its actual and its desired wealth.

Let σ and $(1 - \sigma)$ be the proportion of expenditures used on domestic and foreign goods, respectively. We assume that exports (X) are the difference between total output and the domestic demand for domestic commodities. Thus

$$X = Y - \sigma[(Y - T) + \alpha(w - \bar{w})] - G. \quad (A2)$$

⁸ For a more rigorous analysis of the proposition, see App. B.

760

JOURNAL OF POLITICAL ECONOMY

In (A2) G is government expenditures, and I assume that the government purchases only domestic goods. Imports (M) are

$$M = (1 - \sigma)(Y - T) + \alpha(w - \dot{w}). \quad (\text{A3})$$

Using (A2) and (A3), we see that the balance of trade ($B = X - M$) is

$$B = -[(G - T) + \alpha(w - \dot{w})]. \quad (\text{A4})$$

From (A4) we can see Thornton's proposition about the relationship between the balance of trade and individual expenditures and income. If individual expenditures (E_p) are equal to income ($Y - T$), then from (A1) ($w - \dot{w}$) = 0. In this case from (A4), assuming either no government ($G = T = 0$) or a balanced budget ($G = T$), $B = 0$. With these assumptions about the government, the balance of trade is in deficit only if $(w - \dot{w}) > 0$, which from (A1) implies that $E_p > (Y - T)$.

Thornton's proposition about the effects of government expenditures at home on the balance of trade and my comments in Section 1 can also be seen in (A4). If $G > T$, then, even if $w = \dot{w}$, $B < 0$. Thus an increase in government expenditures not financed by taxes will also lead to a balance of trade deficit.

Appendix B

Consider two countries, A and B. Country B maintains convertibility of its currency into gold; country A does not. Let P , M , and Y represent the price of goods, the quantity of money, and output, respectively, with the appropriate subscript for the two countries. Let \bar{P}_b^g be the fixed price of gold in country B and ϵ the exchange rate, defined as the foreign price of domestic currency. Then

$$M_a = P_a Y_a, \quad (\text{B1})$$

$$M_b = P_b Y_b, \quad (\text{B2})$$

$$\pi = \frac{\epsilon P_a}{P_b}, \quad (\text{B3})$$

$$Y_a = f(\pi, Y_a, Y_b, \delta), \quad (\text{B4})$$

$$P_a^g = \frac{\bar{P}_b^g}{\epsilon}, \quad (\text{B5})$$

$$\sigma = \frac{P_a^g}{P_a}. \quad (\text{B6})$$

Equations (B1) and (B2) are simple quantity theory equations stating that in equilibrium the demand for money is equal to the supply of money in each country. For simplicity I have assumed that velocity is equal to one. Equation (B3) defines the terms of trade. Equation (B4) states that the demand for country A's goods must be equal to its output. The demand for A's goods is assumed to be a function of the terms of trade, A's income, B's income, and δ , a taste parameter. If (B1), (B2), and (B4) hold, then by Walras's law the market for B's goods will also be in equilibrium. Equation (B5) states that the price of gold in country A is equal to the fixed price of gold in country B

BULLIONIST CONTROVERSY

761

adjusted by the exchange rate. Equation (B6) defines the value of gold relative to goods in country A.

The endogenous variables in this system are P_a , P_b , and ϵ and, therefore, π , P_a^g , and σ . The exogenous variables are M_a , M_b , Y_a , Y_b , and δ . Starting from an initial equilibrium in which we normalize the variables so that $P_a = P_b = \epsilon = 1$, we can use the system (B1)–(B6) to examine the effects of the exogenous changes discussed during the bullionist controversy: a change in the quantity of money in country A (dM_a), a bad harvest (dY_a), and an increase in the demand for country A's goods because of a change in tastes ($d\delta$).

1. A Change in the Quantity of Money

$$\frac{dP_a}{dM_a} = \frac{1}{Y_a}; \quad \frac{d\epsilon}{dM_a} = -\frac{1}{Y_a}; \quad \frac{d\pi}{dM_a} = 0; \quad \frac{dP_a^g}{dM_a} = \frac{1}{Y_a}; \quad \frac{d\sigma}{dM_a} = 0.$$

The results above were accepted by Ricardo, Thornton, and Malthus. A change in the quantity of money changes the price of commodities and the market price of gold in the same proportion, leaving unchanged the value of gold in terms of commodities. The exchange rate changes in the same proportion to but in the opposite direction from the change in the price level, leaving the terms of trade unchanged.

2. A Bad Harvest

$$\frac{dP_a}{dY_a} = -\frac{1}{Y_a}; \quad \frac{d\epsilon}{dY_a} = \frac{1}{Y_a} + \frac{1 - f_2}{f_1}; \quad \frac{d\pi}{dY_a} = \frac{1 - f_2}{f_1};$$

$$\frac{dP_a^g}{dY_a} = -\left(\frac{1}{Y_a} + \frac{1 - f_2}{f_1}\right); \quad \frac{d\sigma}{dY_a} = -\left(\frac{1 - f_2}{f_1}\right).$$

In the equations above f_1 and f_2 are the partials of (B4).

Ricardo was willing to concede to Malthus that a bad harvest will have an income effect on the demand for money and therefore will affect gold flows under convertibility or the price level and the exchange rate under inconvertibility: "a bad harvest operates on the exchange in no other way than by causing the currency which was before at its just level to become redundant" (1951a, pp. 106–7). However, without a "real" theory of the determination of international relative prices, the real effects of the bad harvest were ignored. For Ricardo, therefore, the effects of a bad harvest on the endogenous variables would be of the same magnitudes as but opposite signs from the effects of a change in the quantity of money. In the equations above, all terms containing the partial derivatives f_1 and f_2 would be set to zero.

3. A Change in Tastes

$$\frac{dP_a}{d\delta} = 0; \quad \frac{d\epsilon}{d\delta} = \frac{f_4}{f_1}; \quad \frac{d\pi}{d\delta} = \frac{f_4}{f_1}; \quad \frac{dP_a^g}{d\delta} = \frac{-f_4}{f_1}; \quad \frac{d\sigma}{d\delta} = \frac{-f_4}{f_1}.$$

As none of the participants in the bullionist controversy had a real theory of the determination of international relative prices, they did not get the results above. However, Malthus and Thornton had an intuition that a change in tastes would affect the exchange rate. Unless one makes very special small-economy assumptions, their intuitions were correct.

References

- Fetter, Frank W. "The Bullion Report Reexamined." *Q.J.E.* 56 (August 1942): 655-65.
- Grubel, Herbert G. "Ricardo and Thornton on the Transfer Mechanism." *Q.J.E.* 75 (May 1961): 292-301.
- Hume, David. "Of the Balance of Trade." In *Essays, Moral, Political and Literary*. 1752. Reprint. London: Grant Richards, 1903.
- Malthus, Robert. "Publications on the Depreciation of Paper Currency." *Edinburgh Rev.* 17 (February 1811): 340-72.
- Mason, Will E. "Ricardo's Transfer-Mechanism Theory." *Q.J.E.* 71 (February 1957): 107-15.
- Peake, Charles F. "Henry Thornton and the Development of Ricardo's Economic Thought." *Hist. Polit. Econ.* 10 (Summer 1978): 193-212.
- Reisman, David A. "Henry Thornton and Classical Monetary Economics." *Oxford Econ. Papers* 23 (March 1971): 70-89.
- Ricardo, David. *The High Price of Bullion: A Proof of the Depreciation of Bank Notes*. London: Murray, 1810. In *The Works and Correspondence of David Ricardo*, vol. 3, *Pamphlets and Papers, 1809-1811*, edited by Piero Sraffa. Cambridge: Cambridge Univ. Press (for Royal Econ. Soc.), 1951. (a)
- . *On the Principles of Political Economy and Taxation*. 3d ed. London: Murray, 1821. In *The Works and Correspondence of David Ricardo*, vol. 1, edited by Piero Sraffa. Cambridge: Cambridge Univ. Press (for Royal Econ. Soc.), 1951. (b)
- Sayers, Richard S. "Ricardo's Views on Monetary Questions." In *Papers in English Monetary History*, edited by Thomas S. Ashton and Richard S. Sayers. Oxford: Oxford Univ. Press, 1953.
- Thornton, Henry. *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain*. London: Hatchard, 1802. Reprint. Edited by Friedrich A. von Hayek. London: Cass, 1939.
- Viner, Jacob. *Studies in the Theory of International Trade*. London: Harper, 1937.

On some classical monetary controversies

David Glasner

I. Introduction

Most standard accounts of classical monetary theory (e.g., Blaug 1968, O'Brien 1975) emphasize its grounding in the quantity theory of money. Elsewhere (Glasner 1985), I have disputed the identification of classical monetary theory with the quantity theory, arguing that much of classical monetary theory can best be understood as a theory of a competitively produced convertible money in which the nominal quantity of inside money produced by the banking system has no effect on the exogenously fixed price level. For many classical economists, the quantity theory was strictly applicable only to an inconvertible fiat currency. Construed broadly as an extension of supply-demand analysis, the quantity theory could also account for the effects of gold discoveries—but only at the level of the closed world economy, not at the level of an open national one. Moreover, by treating the quantity of money as the exogenous variable to which prices had to adjust, the quantity theory could not cope analytically with the existence of a competitive banking system.

In my 1985 article, I argued that numerous supposed inconsistencies or errors in classical monetary theory—dichotomizing the determination of relative prices and the price level, ignoring the real-balance effect, and belief in Say's Law¹ and the Law of Reflux—can be validly deduced from a model of a competitively produced convertible money. I also suggested that such a model could illuminate several classical monetary controversies that have puzzled later commentators who identified classical monetary theory with the quantity theory.

In this article, I want to examine those controversies in more detail to support my reinterpretation of classical monetary theory. To do so, I shall suggest some new readings of old texts. Obviously those who are used to reading those texts from a quantity-theoretic perspective may find my interpretations forced. Demonstrating the correct reading of a text is a difficult, if not hopeless, task as literary critics and legal scholars well know. But if they are willing to postpone judgment on the basic issue, readers

Correspondence may be addressed to the author, Bureau of Economics, Federal Trade Commission, 6th and Pennsylvania Avenue, NW, Washington, DC 20580.

1. Unless otherwise indicated, I use Say's Law in the strong sense of Say's Identity throughout the article.