ONE

Introduction

The desire of power in excess caused the angels to fall.[1] It has cast down a host of their creatures as well. With the Treaties of Tilsit in 1807, the Emperor of France gained dominion over Europe. The ancient monarchs became his servants, their treasures his treasures, and their armies subjugated to his command. One check remained to end of his ambition – the British navy – and behind it, the burgeoning commerce and institutions of law and government of a free and sanguine people. To these and to their annihilation, the emperor's thoughts turned. He intensified the campaign to undermine Britain's commerce and thus her means of financing the war effort, and sought to build a comparable fleet. If the strategy succeeded, invasion was inevitable. On the opposite side, Britain fought to maintain her trade with the Continent while funding resistance in Portugal, Spain, Austria, Russia, and the Mediterranean, which sapped the emperor's resources.

The Napoleonic Wars proved a watershed in the development of economic theory because of the extreme conditions created by the conflict. Under the Continental System, Britain was cut off, partly, from foreign supplies and British farmers resorted to land of poorer quality to feed the country's growing population.[2] The rise in production costs associated with the extension of cultivation led to the discovery of the law of diminishing returns to variable inputs (labor and capital) given a fixed input (land). Similarly, after the Continental System collapsed, economists

[1] From Francis Bacon's essay "Of Goodness and Goodness of Nature."
[2] My comments about the Continental System and Britain's response to that system are based on Heckscher (1922).

noticed an inverse relationship between imports and prices that suggested a downward-sloping demand schedule. With respect to macroeconomic theory, Britain's war finance – which required the suspension of the gold standard during the war and its resumption afterward – proved crucial to the progress of monetary theory. Also, the periodic crises of the post-war years prompted much study of the law of markets and of the fiscal response to unemployment and stagnation. I begin with a discussion of monetary theory and policy.

At the height of the Napoleonic Wars, Parliament was spending £100 million annually – one-third of national income. The government at first tried to fund the war through taxes, but that proved impossible. In the end, the campaign was financed by several hundred million in long-term bonds, with sales of Exchequer bills and advances from the Bank of England smoothing cash flows over short periods. The Bank played a central role in the war effort. This required the sacrifice of its financial interests more than once to Brittania's cause.

Extending credit to the government interfered with the Bank's ability to manage the circulation of its notes. Loans to the government early in the war prevented the Bank from checking the inflation of the 1790s; this led to the loss of its treasure and to the suspension of cash payments.[3] The directors of the Bank protested but could not refuse ministers who granted the Bank's charter and who protected its monopoly powers. After the initial bout of wartime inflation, prices receded and the gold standard came again within reach. But, just as events favored a return to cash payments, the Spanish uprising triggered a second round of inflation.

Spain's revolt against Bonaparte opened the Iberian peninsula to British soldiers and the markets of South America to British trade. The Bank was active in what followed on both fronts. The annual average of discounts given by the Bank to merchants, manufactures, and traders increased by £2 million in 1809, then surged another £5 million in 1810,

[3] Notes of the Bank of England were convertible into gold and/or silver prior to 1797. This meant that a person holding a banknote had the right to exchange it for gold or silver at the Bank at a fixed rate. During the inflation of the 1790s the market price of gold surpassed the price at which the Bank was obliged to sell gold. It became profitable for anyone holding a banknote to trade it for gold at the Bank and to immediately resell the gold in the market. Millions in notes returned to the Bank, depleting its hoard. To avoid default, the Bank appealed to Parliament for the right to stop cash payments – that is, for the right to stop exchanging its notes for gold or silver. In 1797, by an Order in Council, the government allowed the Bank to suspend cash payments. From 1797 to 1820, the Bank was not legally obliged to exchange its notes for gold; this interval is termed the "Restriction period."

reaching £20 million.[4] At the same time, the British government looked to the Bank to finance the Peninsular campaign. This set off a fiscal moil in London because the campaign was expensive,[5] the limits of taxation had been reached,[6] and ministers feared that further loans would depress bond prices. The government's official position, stated at the annual presentation of the national budget, was that public finances were robust and the supply of funds for the war effort was abundant (12 May 1809, *Hansard* 1s 14:531–535; 16 May 1810, *Hansard* 1s 16:1044–1048). However, private correspondence between Spencer Perceval, Chancellor of the Exchequer, and the Bank reveals that the government urgently needed assistance.[7] The Bank upheld its duty: it provided the government direct loans and purchased securities in the market.[8] Its directors never refused the Chancellor, but only because they feared what would happen if the nation's finances collapsed. On 7 March 1811, the Bank informed Perceval that further advances to the government would be conditioned on the government's repurchasing large sums of Exchequer bills. To this, Perceval replied:

> I regret that I have not found it in my power to reduce the amount of Exchequer Bills in the hands of the Bank. . . . The urgency of the public service [make it

[4] The discounts of 1810 were not as inflationary as they appear. The South American trade collapsed in the spring of 1810. The *Minutes* of the Bank Court for that year are filled with pleas from merchants asking for extensions of time to pay. An average delay of two weeks by the Bank's clients in repaying their debts accounted for the increase in the volume of discounts.

[5] The initial phases of the campaign caused the army's budget to rise from £24 million to £29 million annually. At the end of the war the army's budget swelled to £50 million (Mitchell 1988, 587). The navy incurred increasing costs to protect merchant ships from French, Danish, and, later, American privateers.

[6] See the comments by the Chancellor of the Exchequer and by William Huskisson in the debate in Parliament on the Budget of 1810 (16 May 1810, *Hansard* 1s, 16:1052–1054). According to Huskisson, "What he had said was, that it would be difficult to find new taxes which would not be extremely objectionable – that there was a limit to taxation – and that we had nearly reached that limit."

[7] The Chancellor of the Exchequer asked the Bank to purchase public securities in the market – £2 million at a time – on 29 June 1809, 28 Sept. 1809, 21 Dec. 1809 and 29 Mar. 1810. On 15 Feb. 1810, the government obtained also an advance from the Bank of £3 million (Bank of England, *Minutes of the Court of Directors*, G4/33, 66–67, 128–129, 181–182, 217–218, 254).

[8] The Bank's assistance to the government began to increase in 1807. The combined value of public securities held by the Bank and advances to the government stood at £13,665,339 in Aug. 1807; £15,677,539 in Aug. 1808; £16,009,339 in Aug. 1809; and £17,689,739 in Aug. 1810. By the end of the war, the Bank held £35 million in government securities (House of Commons, *Second Report from the Secret Committee on the Expediency of the Bank Resuming Cash Payments*, 1819, App. 3, House of Commons, *Report from the Committee of Secrecy on the Bank of England Charter*, 1832, App. 5).

impossible]. . . . I will endeavor as much as the circumstances of the public service may permit to diminish or keep down the advances of the Bank; and I trust that with this assurance, the Court of Directors will waive any express condition and consent in the usual manner to accommodate the public (Bank of England, *Minutes of the Court of Directors*, 23 May 1811, Document G4/34, 63–65).

The Court of Directors agreed, granting the government an additional £2 million, but with the demur that "were it not from an apprehension that the public service would be seriously impeded, the application could not be acceded to" (Bank of England, *Minutes of the Court of Directors*, 23 May 1811, Document G4/34, 66).

A sustained rise in the circulation of banknotes began in the fall of 1808.[9] Signs of inflation soon appeared: a rise in the market price of gold and a fall of the pound sterling on the foreign exchange. Gold was selling close to its Mint price early in 1808.[10] But toward the end of the year its price suddenly advanced and by April 1809, gold was selling at £4 12s. per ounce.[11] The change represented a fall of sterling by about 19 percent, vis-à-vis its former standard. The pound fell similarly against foreign currencies. There was no true par of the exchange given that the relative price of gold to silver fluctuated. But, based on the amounts of gold and silver in English and foreign coins, the pound should have traded in the range of £1 to 25 francs in Paris and £1 to 35 Flemish shillings in Hamburg. By the summer of 1809, however, the pound traded at £1 to 20 francs in Paris and £1 to 28 Flemish shillings in Hamburg[12] – a fall of 20 percent.

Hundreds of pamphlets and articles appeared, purporting to identify the causes of these events and advising Parliament how to respond. In retrospect, the episode has been termed the "Bullion Controversy." At the height of the controversy, an anonymous letter restating arguments critical of the Bank of England appeared in the *Morning Chronicle*.[13] It

[9] The Bank's circulation increased from £17,365,266 in Aug. 1808 to £24,446,175 in Aug. 1810 (House of Commons, *Second Report from the Secret Committee on the Expediency of the Bank Resuming Cash Payments*, 1819, App. 10).

[10] After the Bank restriction began in 1797, the market price of gold remained at the Mint price (£3 17s. $10^{1/2}$ d.) for two years. From 1799 to 1801 the market price of gold increased about 10%; it then gradually declined toward the Mint price.

[11] House of Commons, *Report from the Select Committee on the High Price of Gold Bullion*, 1810, p. 1.

[12] House of Commons, *Report from the Select Committee on the High Price of Gold Bullion*, 1810, App. 58, 59, and 60.

[13] An article titled "The Price of Gold," published in the *Morning Chronicle* on 29 Aug. 1809.

was followed by two more letters to the *Chronicle* and then by a pamphlet, *The High Price of Bullion*, published under the author's name: David Ricardo. The pamphlet was an immediate success and sold four editions. It marked the beginning of Ricardo's career as a public figure and of his contribution to economics.

Ricardo was not an academic. He was a financier and politician. His preoccupation with the business and politics of London is reflected in that his published works deal almost exclusively with immediate national concerns: the monetary policy of the Bank of England, the causes of unemployment and depressions in trade, and the effect of the corn laws on economic growth and on the distribution of income. Within his analyses of macro issues Ricardo applied a number of theories for which he is now famous in undergraduate textbooks: the idea that comparative advantage is the basis for international trade; the labor theory of value; the quantity theory of money; some form of Say's law; the concept of diminishing returns; and "Ricardian equivalence," which is the conjecture that public debt and taxes have equivalent effects on consumer behavior. For pedagogic purposes, textbooks address these theories separately and in the abstract. But Ricardo did not develop his theories as isolated, abstract concepts. They were instead components of larger models he applied to contemporary debates about monetary, fiscal, and agricultural policy.

Monetary Theory and Policy

The Bullion Controversy, during the course of which Ricardo came to prominence, concerned the extent to which the Bank of England was responsible for wartime inflation. Bullionists interpreted the premium on gold and the fall of sterling on the foreign exchange as evidence that the notes of the Bank of England were depreciated. Subject to minor qualifications, the premium on gold was also interpreted to measure the extent to which banknotes had been issued in excess. Thus, when the market price of gold was £4 12s. per ounce, Bullionists anticipated that the Bank would have to curb its circulation 20 percent to restore the currency to par. Because of their concern with inflation, Bullionists endorsed the gold standard. Tying banknotes to gold, they believed, would prevent the Bank from issuing its notes in excess, and that would put a stop to inflation.

Antibullionists defended the Bank. They attributed the premium on gold and the fall of sterling to causes beyond the Bank's control, among these that sterling had fallen because of subsidies paid to Britain's allies

and because of the costs of foreign military operations; that sterling had fallen because of large importations of foreign corn; and that the rise in gold and the fall of sterling resulted from too great a circulation of country-bank notes. Antibullionists based their position on the Real Bills Doctrine. The doctrine arose from a misinterpretation of a passage in Adam Smith's *Wealth of Nations*.[14] The passage says nothing about the management of an inconvertible currency. Smith merely observed that prudent bankers discounted bills of exchange backed by collateral such as actual goods in process. Smith understood that without the check of convertibility, an excess issue of banknotes was possible (Smith 1776, 354–356). For, whenever the market rate of profit surpassed the rate of interest – then a maximum 5 percent under the usury laws – the demand for discounts was potentially unlimited. If the Bank indulged this demand, spiraling inflation was inevitable inasmuch as inflation would raise the nominal rate of profit, leading to ever greater demands for discounts, which, in turn, would expand the money supply, causing further inflation.

Despite the difficulties of the Real Bills Doctrine,[15] it was central to the position of the Antibullionists. The doctrine implied that the Bank of England could never overextend its circulation so long as it only discounted bills of exchange that represented actual commodities or goods in process. It thus lent credibility to the Bank's management of the money supply and became for that body a sort of mantra until the 1820s.[16]

Bullionists relied on the quantity theory of money. The quantity theory describes the relationship between the supply of money (M) and the level

[14] "When a bank discounts to a merchant a real bill of exchange drawn by a real creditor upon a real debtor, and which, as soon as it becomes due, is really paid by that debtor; it only advances to him a part of the value which he would otherwise be obliged to keep by him unemployed and in ready money for answering occasional demands" (Smith 1776, 331).

[15] The Real Bills Doctrine relied on a number of fallacies. The first, just mentioned, was the failure to recognize that there would be an unlimited demand for bills whenever the market rate of profit exceeded the discount rate. Second, the doctrine did not distinguish between credit and credit instruments and so failed to account for credit instruments forming part of the circulating medium. Finally, the distinction between real and fictitious bills was spurious because the length of time a bill was discounted did not correspond to the time that goods were in process (Laidler 1987, 4:635).

[16] Not all directors of the Bank were Antibullionists. However, the Bank's official position, both toward the Select Committee on the High Price of Gold Bullion (1810) and toward the House of Commons Secret Committee on the Expediency of the Bank Resuming Cash Payments (1819), was that the price of gold and the value of sterling on the foreign exchanges fluctuated independently of the Bank's control (Horsefield 1949, 442–448).

of prices (P). Given the volume of trade (T) and the velocity of money (V), this relationship is summarized by the following equations of exchange:

$$M \times V = P \times T \quad \text{or} \quad P = (V/T) \times M$$

The right-hand equation shows that the price level, at any given time, is proportionate to the supply of money. This much was not controversial. What concerned classical economists was whether inflation was always and everywhere a monetary phenomenon.[17] In other words, was there a stable proportionate relationship between money and prices such that fluctuations in the money supply were the key determinant of changes in prices? A subordinate point of contention concerned how the price level, and thus inflation, should be measured.

For Bullionists, the market prices of gold and silver and the value of sterling on the foreign exchange served as proxies for the price level. They interpreted a premium on gold or silver or a fall of sterling on the exchange as signs of inflation (Viner 1937, 125–128). The extent of the premium was also assumed to measure – approximately – the extent to which the Bank of England issued its notes in excess. The measure was only approximate because, as the more subtle theorists understood, the velocity of money was likely to rise in an inflationary boom. And this rise would contribute to a rise in prices more than proportionate to the increase of the money supply. Thus the standard measures of inflation would overstate the excess circulation of the Bank's notes.[18] There was a second qualification: the price of gold and the foreign exchange were affected by the activities of country banks. Country-bank notes were convertible into notes of the Bank of England so there was ultimately some check to their value. However, country banks were not constrained by a fixed reserve requirement. They were thus vested with the ability to cause inflation by expanding credit too rapidly; or, in a financial panic, the country banks were likely to cause deflation by suddenly withdrawing credit. The variations of the country circulation, which were often extreme, affected prices independently of the policies of the Bank of England.[19] A third qualification was that gold and silver were commodities that fluctuated in value for reasons

[17] Friedman 1987, 3–20; see also Laidler 1991b.

[18] Ricardo knew velocity is not constant: the value of the money supply as compared with the commodities which it circulates "depends upon the rapidity of circulation, upon the degree of confidence and credit existing between traders, and above all, on the judicious operations of banking" (Ricardo, 3:90).

[19] In the long term, Ricardo thought that the country circulation was rigidly proportionate to the circulation of the Bank of England (3:88) but this did not preclude short-term

not connected with the money supply. Wars, the discovery of mines, and the policies of foreign governments all affected the value of metals. Lastly, wartime remittances or sudden changes in the level of international trade were likely to affect the foreign exchange. The investigation of this final point proved of lasting significance to monetary theory.

At the outset of the Bullion Controversy, there was no coherent analysis of how the balance of international trade adjusted to certain disturbing factors; the principal disturbances were (1) subsidies to foreign powers, (2) the importation of grain upon a failure of the domestic harvest, and (3) an excessive rise in the circulation of Bank of England notes. David Hume described how an increase in the domestic money supply – comprised wholly of specie – would trigger inflation in the home market. With inflation, imported goods would seem relatively cheaper at home and British exports would seem exorbitant abroad. He reasoned that the disparity in prices between the home and foreign markets would cause a trade deficit that would be funded by an outflow of specie, the international movement of which would gradually raise prices abroad while lowering prices domestically (Hume 1752, 3:333). Hume did not explain why gold – a commodity also rising in price – would be exported in preference to other commodities. He also provided no analysis of the effects of inflation when the money supply consisted of inconvertible paper.

Adam Smith did not improve on the specie-flow theory. In fact, experts debate whether he even accepted it.[20] His formal analysis of an exogenous increase in paper money was less sophisticated than Hume's, being only a physical analogy to water overfilling a channel: when paper money circulates in excess, coin leaves the country till the excess is eliminated.[21] His thoughts were more subtle elsewhere. He allowed that the international movement of bullion is regulated by its supply, relative

variations (3:86–88, 231). For a discussion of the role of country banknotes in the currency, see Fetter 1965, 48–51.

[20] Hollander (1973, 205) reviews the debate about whether Smith used the specie-flow theory.

[21] "The channel of circulation, if I may be allowed such an expression, will remain precisely the same as before. One million we have supposed sufficient to fill that channel. Whatever, therefore, is poured into it beyond this sum, cannot run in it, but must overflow. . . . But though this sum cannot be employed at home, it is too valuable to be allowed to lie idle. It will, therefore, be sent abroad, in order to seek that profitable employment which it cannot find at home. . . . But though so great a quantity of gold and silver is thus sent abroad, we must not imagine that it is sent abroad for nothing, or that its proprietors make a present of it to foreign nations. They will exchange it for foreign goods of some kind or another" (Smith 1776, 318–319).

to the effectual demand, at home and abroad.[22] He also understood that variations in foreign exchange rates affect the balance of trade and thus the international movement of gold and silver.[23]

Ricardo's contribution to the study of the balance of international indebtedness lay in describing how inflation would lead to the export of bullion when the money supply in the home market consisted of specie and/or convertible paper. Ricardo described the mechanism of international debt adjustment and other aspects of the Bullionists' position in the *High Price of Bullion* (1810) and the *Reply to Bosanquet* (1811). Both works attribute the rise in the domestic price of gold and the fall of sterling on the foreign exchange to the wartime monetary policy of the Bank of England. Consonant with the quantity theory,[24] the pamphlets show an inversely proportionate relationship between the circulation of banknotes and the value of sterling on the foreign exchange, and a proportionate relationship between the circulation of banknotes and the price of gold.

Ricardo's account of the mechanism of international debt adjustment begins with Hume's theory of a commodity money system (*High Price*, Ricardo, 3:54). The account proceeds to consider the mechanism when the circulation consists of (1) specie and convertible paper, (2) specie and inconvertible paper, and (3) convertible paper alone. Under each monetary arrangement, an excessive issue of coin or banknotes leads to an unfavorable balance of trade and to the export of bullion. Ricardo envisioned the process as follows. An expansion of the money supply lowers the rate of interest. The fall of interest stimulates demand in all markets and thereby raises prices. As prices rise, the demand for loanable funds increases until such time as interest rates return to normal levels.

[22] "When the quantity of gold and silver imported into any country exceeds the effectual demand, no vigilance of government can prevent its exportation . . . If, on the contrary, in any particular country their quantity fell short of the effectual demand, so as to raise their price above that of the neighbouring countries, the government would have no occasion to take any pains to import them" (Smith 1776, 463).

[23] Smith described the consequences of a fall of sterling on the foreign exchange: "The high price of exchange . . . must necessarily have operated as a tax, in raising the price of foreign goods, and thereby diminishing their consumption. It would tend, therefore, not to increase, but to diminish, what they called, the unfavourable balance of trade, and consequently the exportation of gold and silver" (Smith 1776, 461).

[24] Ricardo was acquainted with the quantity theory in the form $M \times V = P \times T$. In the *Notes on Bentham* he wrote: "May we not as before put the mass of commodities of all sorts on one side of the line, – and the amount of money multiplied by the rapidity of its circulation on the other. Is not this in all cases the regulator of prices?" (3:311).

[I]f the Bank were to bring a large additional sum of notes into the market, and offer them on loan . . . they would for a time affect the rate of interest. . . . If the amount were large, the Bank . . . might not be able to lend the notes or the money at four, nor perhaps, above three per cent.; but having done so, neither the notes, nor the money, would be retained unemployed by the borrowers; they would be sent into every market, and would every where raise the prices of commodities, till they were absorbed in the general circulation. It is only during the interval of the issues of the Bank, and their effect on prices, that we should be sensible of an abundance of money; interest would, during that interval, be under its natural level; but as soon as the additional sum of notes or of money became absorbed in the general circulation, the rate of interest would be as high, and new loans would be demanded with as much eagerness as before the additional issue (*High Price*, Ricardo, 3:91).

To the extent that monetary inflation raises the market price of gold above the face value of coins, it becomes profitable to melt coins and to sell the bullion.[25] A similar result obtains if the currency consists of convertible paper alone; a rise in the market price of gold provides the incentive to return notes to the Bank in exchange for bullion, which is then sold.[26] The end result under a system of either commodity money or convertible paper is that the market supply of bullion increases. The rise in the supply of bullion reduces its value relative to all other commodities, making it the least expensive commodity to export in exchange for foreign goods.[27] The fall in the relative value of bullion thus leads to a trade deficit:

The effect of an increased issue of paper would be to throw out of circulation an equal amount of specie; but this could not be done without adding to the quantity of bullion in the market, and thereby lowering its value, or in other words, increasing the bullion price of commodities. It is only in consequence of this fall in the value of the metallic currency, and of bullion, that the temptation to export them

[25] "Would not the coin be melted and sold as bullion at home, till the value of bullion had so much diminished in its relative value to the bullion of other countries, and therefore to the relative value of commodities here, as to pay the expenses of transportation" (*Reply to Bosanquet*, Ricardo, 3:212).

[26] "The excess [notes] would be immediately returned to them for specie; because our currency, being thereby diminished in value, could be advantageously exported, and could not be retained in our circulation . . . but if the Bank . . . continued to re-issue the returned notes, the stimulus which a redundant currency first gave to the exportation of coin would be again renewed with similar effects" (3:57–59).

[27] Marcuzzo and Rosselli (1994) represent the condition for the export of bullion by this expression: $P_{\text{gold}}(1 + T_{\text{gold}})/P^*_{\text{gold}} \leq P_i(1 + T_i)/P_i^*$ for all tradeable commodities $i = 1, \ldots, n$; where P_{gold} is the domestic price of gold; T_{gold} is the transportation cost of shipping gold abroad as a percentage of the price; P^*_{gold} is the foreign price of gold; P_i is the domestic price of commodity (i); T_i is the transportation cost of shipping commodity (i) abroad as a percentage of the price; and P_i^* is the foreign price of commodity (i).