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GOLD AND MONEY IN RICARDO’S *PRINCIPLES*

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Abstract

The integration of money in Ricardo’s theory of value and distribution is realised in *Principles* and the 1819-1823 papers by putting the standard of money centre stage. This raises two questions: Is money a commodity? Is the standard of money (gold bullion) a commodity? The paper offers a negative answer to the first and a qualified positive one to the second. In Ricardo’s mature theory of money, in which the value of money depends on the value and on the price of the standard, money is neither a competitively-produced commodity nor a monopolised one. However, discarding a commodity-theory of money did not mean for Ricardo adopting a quantity theory: the determination of the value of money is *sui generis* in that the quantity of money is “regulated” by the standard. Although produced by the competition of capitals, this standard of money is a very special commodity: it should not be part of the system of production of commodities that determines the relative prices and the distribution of income. The fulfilment of this condition does not require the standard to be metallic: it could as well be a public bond purchased and sold for money by a central bank at a fixed price and traded on a secondary market – a situation not far from that of our modern economies.

This paper is short, since it is based on my recently published book, *Ricardo on Money. A Reappraisal* (Deleplace 2017) to which the reader may be directed for further developments, and also because it mostly aims at paying a tribute to David Ricardo, on the occasion of the bicentenary of *On the Principles of Political Economy, and Taxation* (Ricardo 1817).

The main object of my book is to show that, in contrast with the Bullion Essays of 1809-1811 (such as *The High Price of Bullion* and *Reply to Bosanquet*), there exists in Ricardo after 1815 a mature theory of money which integrates money in his theory of value and distribution, that is, makes the determination of the value of money consistent with the determination of the value of commodities and of the level of distributive variables, as it is analysed in *Principles*. This integration operates through the standard of money, and this means that this mature theory of money in Ricardo only applies to a currency with a standard.

In Ricardo the standard of money is gold bullion. Inquiring about the role of the standard of money in Ricardo’s theory of value and distribution – that is, in his theory of a market economy – amounts to asking two questions: 1. Is money a commodity? Answer: No. 2. Is gold a commodity? Answer: Yes, but a very special one. Sections 1 and 2 of the paper respectively raise these questions. Section 3 concludes on the relevance of Ricardo’s theory of money for a monetary system endowed with a non-metallic standard.

1. MONEY: NOT A COMMODITY

1.1. Ricardo's mature theory of money

In *Proposals for an Economical and Secure Currency* (1816), Ricardo defined “a perfect currency” as follows:

A currency may be considered as perfect, of which the standard is invariable, which always conforms to that standard, and in the use of which the utmost economy is practised. (*Proposals*; IV: 55)¹

It is usually the third aspect – the “economical” one – which attracts the attention of the commentators interested in the practical dimension of Ricardo's views on money. But the first two aspects are the important ones at the theoretical level. The question of the invariable standard is an integral part of Ricardo's theory of value and distribution, and it is well-known that Ricardo was concerned with it until the last days of his life. As shown in the above quotation, it was also an integral part of his theory of money. However, the proper object of this theory was the analysis of the conditions under which money might “conform to that standard”, even if the latter was not strictly invariable in value. Gold being the standard, the conformity of money to the standard meant for Ricardo that a given weight of the metal in the form of money (whether coin or convertible note) was of equal value in terms of commodities with the same weight of gold in bullion. This condition was fulfilled when the market price of gold bullion was equal to the legal price of gold (coined gold in the system where the Bank of England note was convertible into coin, or gold bullion in the Ingot Plan where the note was convertible into bullion).

In various writings between 1819 and 1823, Ricardo used this notion of conformity of money to the standard as the basis of an important distinction he made between “a fall in the value of money” and “a depreciation of money.” In two speeches in Parliament on respectively 12 June and 7 May 1822 he declared:

The great mistake committed on this subject was in confounding the words “depreciation” and “diminution in value.” [...] It might so happen that a currency might be depreciated, when it had actually risen, as compared with commodities, because the standard might have risen in value in a still greater proportion. (V: 203, 166)

This paradox of a currency rising in value (in terms of all commodities except the standard) while it is depreciated (in terms of the standard) may be explained thanks to what I call the Money-Standard Equation, derived from the condition of conformity (see Deleplace 2017, Chapter 4):

$$(1.1) \quad \Delta V_M / V_M = \Delta V_G / V_G - \Delta P_G / P_G$$

in which $\Delta V_M / V_M$ is the rate of change in the value of money, $\Delta V_G / V_G$ is the rate of change in the value of gold bullion (both values in terms of all commodities except gold bullion), and $\Delta P_G / P_G$ is the rate of change in the market price of gold bullion.

¹ All quotations refer to the Sraffa edition of *The Works and Correspondence of David Ricardo* (Ricardo 1951-1973). When the extract is from a book or a pamphlet, its title is indicated in abbreviation, with the volume (in Roman numeral) and pagination (in Arabic numeral) in *Works*. When it is from a speech or evidence, only the volume and pagination are indicated.

Equation (1.1) states that the rate of change in the value of money during a period is determined by the rate of change in the *value* of the standard minus the rate of change in the *price* of the standard. This equation thus formalises the conjunction of two additive channels through which the value of money may vary: a change in the value of the standard and a change in its price. In particular, money could rise in value while being depreciated – as testified by a rise in the market price of bullion –, because the value of bullion had risen more than its price. The Money-Standard Equation thus accounts for any combination of change in the value of gold bullion and of change in its price, the resultant being a rise, a fall, or constancy in the value of money. As Ricardo declared in Parliament on 11 June 1823:

A currency might be depreciated, without falling in value; it might fall in value, without being depreciated, because depreciation is estimated only by reference to a standard. (V: 311)

The first cause of change in the value of money – a change in the *value* of the standard – was “real”: it reflected a change in the conditions of production of the standard, such as the discovery of a new highly-productive gold mine. The second cause of change in the value of money – a change in the *price* of the standard – was monetary: it reflected the excess (or deficiency) of the actual quantity of money M in respect to the quantity consistent with the “wants of commerce” hence fulfilling the condition of conformity. Calling M^* this conformable quantity of money, the following relation holds:

$$(1.2) \quad \Delta P_G / P_G = \Delta M / M - \Delta M^* / M^*$$

with $\Delta P_G / P_G$ the rate of change in the market price of gold bullion, $\Delta M / M$ and $\Delta M^* / M^*$ the rates of change in respectively the actual and the conformable quantities of money. From (1.1) and (1.2) one obtains:

$$(1.3) \quad \Delta V_M / V_M = \Delta V_G / V_G - [\Delta M / M - \Delta M^* / M^*]$$

Equation (1.3) reformulates the Money-Standard Equation (1.1) to take into account how a change in the aggregate quantity of money affects the market price of gold bullion. The two causes of change in the value of money (a change in the value of the standard and a change in its market price) now become a change in the value of the standard (with a positive sign) and the difference between the rates of change in the actual and the conformable quantities of money (with a negative sign). An exogenous change in the value of gold bullion V_G – such as the discovery of a new mine or the exhaustion of the existing ones – caused a change in the value of money in the same direction. As for the second cause of change in the value of money, namely the difference between the rates of change in the actual and the conformable quantities of money, Ricardo exposed it in *Proposals*:

The value of money then does not wholly depend upon its absolute quantity, but on its quantity relatively to the payments which it has to accomplish; and the same effects would follow from either of two causes—from increasing the uses for money one tenth—or from diminishing its quantity one tenth; for, in either case, its value would rise one tenth. (*Proposals*; IV: 56)

In this example, supposing no alteration in the value of gold bullion ($\Delta V_G / V_G = 0$), $\Delta V_M / V_M = +0.1$ because either $\Delta M^* / M^* = +0.1$ or $\Delta M / M = -0.1$.

According to equation (1.3), the value of money adjusts to an exogenous variation in the value of gold bullion and to a change either in the conformable quantity of money M^* , following a change in the “wants of commerce”, or in its actual quantity M , consequent upon a discretionary change in the note issue. On the basis of Ricardo’s indications in *Proposals*, in *Principles*, and in the 1819-1823 papers, one may analyse the adjustment of the value of money to these different kinds of change (see Deleplace 2017, Chapters 5 to 7). One may also answer the question: what is the economic nature of that money the value of which is determined by the Money-Standard Equation?

1.2. The economic nature of money

One may first discard the idea that money belongs to that category of commodities defined in the first chapter of *Principles* as follows:

In speaking then of commodities, of their exchangeable value, and of the laws which regulate their relative prices, we mean always such commodities only as can be increased in quantity by the exertion of human industry, and on the production of which competition operates without restraint. (*Principles*; I: 12)

In the conformable state of the monetary system, as it existed before 1797 and from 1821 onwards (with convertibility of the Bank of England note into coin), or as it would exist under the Ingot Plan (with convertibility of the note into bullion), the market price of gold bullion remained equal to the legal price of gold (respectively in coin or in bullion), so that $\Delta P_G / P_G = 0$. This condition was fulfilled when the actual quantity of money varied with the “wants of commerce” (so that $\Delta M / M - \Delta M^* / M^* = 0$). From (1.1) or (1.3) one derives the rate of change $\Delta V_{M^*} / V_{M^*}$ of the value of money in the conformable state:

$$(1.4) \quad \Delta V_{M^*} / V_{M^*} = \Delta V_G / V_G$$

This equality only means that the condition of conformity of money to the standard is maintained through time, but it does not allow confusing money with the standard of money: (1.4) results from the adjustment of the actual quantity of money to its conformable level, but this adjustment is *not* a gravitation process. Although in both cases the driving force is exclusively on the supply side, the change in the quantity supplied of money is not implemented by the mobility of capital looking for the natural rate of profit but by the working of the monetary system in response to arbitrage (in the existing system) or to a policy rule (in the Ingot Plan).² Gold bullion *is* a competitively-produced commodity (see Section 2 below), *not* money.

One might then suggest that money is a monopolised commodity, the value of which is only determined by supply and demand, as Ricardo emphasised in *Principles*:

Commodities which are monopolized, either by an individual, or by a company, vary according to the law which Lord Lauderdale has laid down: they fall in proportion as the sellers augment their quantity, and rise in proportion to the eagerness of the buyers to purchase them; their price has no necessary connexion with their natural value. (ibid: 385)

² It is the reason why the expression “natural quantity of money” used in Marcuzzo and Rosselli (2015) does not seem to me appropriate.

This definition does not apply to money for two reasons. First the demand for money does not depend on “eagerness” or caprice but on the aggregate value of the commodities circulated by money, so that “for money, the demand is exactly proportioned to its value” (ibid: 193). Second, in the absence of any “natural value” of money, it is true that the value of money “has no necessary connexion” with such value. As shown by the Money-Standard Equation, this connexion nevertheless exists with a “natural value”: that of the standard. Money has in common with monopolised commodities that its quantity may be reduced (increased) so as to raise (lower) its value – what Ricardo calls “the principle of limitation of quantity” (ibid: 353) – but, in a monetary system endowed with a standard, this change in the quantity supplied is not arbitrary: it is ultimately “regulated” by the standard:

The only use of a standard is to regulate the quantity, and by the quantity the value of a currency. (*Proposals*; IV: 59)

This regulation, as it is embodied in equation (1.3), is what distinguishes money from commodities (whether competitively-produced or monopolised). However, the inverse relationship between $\Delta V_M / V_M$ and $\Delta M / M$ in equation (1.3) and the second part of the above quotation should refrain from concluding that this specificity of money in Ricardo is simply a quantity theory of money. As the first part of the sentence makes clear, the quantity of a currency only “regulates” its value since it is itself regulated by the standard. The difference between Ricardo’s theory of money and the so-called Quantity Theory of Money should now be clarified (for more details see Deleplace 2017: 262-5 and 272-6).

The Quantity Theory of Money is traditionally presented in the form of the Cambridge equation $M = KPT$ (with M the supply of money, K the proportion of the real volume of their planned transactions T which individuals wish to hold as real balances, and P the price level of the commodities transacted, so that KPT is the demand for money) or in the form of the equation of exchange $Mv = PT$, in which the velocity of circulation v replaces its reciprocal K (see Patinkin 1956: 97). The value of money V_M being defined as the reciprocal of the general price level P , both expressions lead to the following relation, with K (respectively v) supposed to be a given parameter reflecting the organisation of monetary transactions:

$$(i) \quad \Delta V_M / V_M = \Delta T / T - \Delta M / M$$

Equation (i) leads to the well-known conclusion that the value of money V_M falls (the general price level P rises) if the exogenous supply of money M increases faster than the volume of transactions T determined independently (money being neutral in respect to aggregate output).

A comparison between equation (1.3) that formalises Ricardo’s mature theory of money and equation (i) of the Quantity Theory of Money makes it necessary to distinguish in Ricardo between the conformable state of the monetary system – in which $V_M = V_M^*$ and $M = M^*$ – and situations in which these equalities are not fulfilled. These situations may thus be conveniently called monetary disequilibrium (this term being only used here because it speaks for itself in the literature, without implying that the conformable state is an equilibrium state). As shown by equation (1.4), in the conformable state the rate of change $\Delta V_M^* / V_M^*$ in the value of money is independent of its quantity. The conformable value of money varies with the value of the standard and only with it. As for the conformable quantity of money M^* , it is

a function of its value V_M^* – hence of the value of the standard V_G – and of the aggregate value of the commodities which it circulates; it is thus endogenously determined. In the conformable state, there is no equilibrium value of money determined by the equality between an exogenously-given supply of money and a demand for money, in contrast with the Quantity Theory of Money.

Disequilibrium occurs when the monetary system departs from its conformable state because $\Delta M / M \neq \Delta M^* / M^*$. The rate of change in the value of money $\Delta V_M / V_M$, as given by (1.3), is now affected by the rate of change in the actual quantity of money $\Delta M / M$. However, it should be noted that, while (i) is an equilibrium relation, the value of money varies inversely with its quantity only in disequilibrium. Moreover, such disequilibrium triggers an endogenous adjustment of the actual to the conformable quantity of money. In the existing system, if $\Delta M / M < \Delta M^* / M^*$ (the actual quantity of money is deficient), this adjustment operates through new coining and / or discounting of bills for notes. If $\Delta M / M > \Delta M^* / M^*$ (the actual quantity of money is in excess), it operates through melting and a reduction in the note issue forced by the conversion of notes into coin at the Bank. In the Ingot Plan, the adjustment in both directions is implemented by a policy rule: the note issue is varied inversely with the sign of the difference between the market and the legal prices of gold bullion.

A last difference between Ricardo's theory of money and the Quantity Theory of Money lies in the channel of transmission of a change in the quantity to the value of money. This is made clear in (1.1) and (1.2) from which (1.3) derives: in disequilibrium, a change in the quantity of money affects its value indirectly, through a change in the market price of the standard. This contrasts with the Quantity Theory of Money in which a change in the quantity of money affects its value directly because of real-balance effects on the demand for money.

To conclude on Ricardo's mature theory of money, one may observe that, contrary to recurrent criticism, it is not exposed to contradiction or incoherence between an alleged commodity-theory of money and an alleged quantity theory of money, simply because it embodies neither the former nor the latter. This theory is *sui generis*, and the standard of money is centre stage in it. This leads to the question of whether this standard – gold bullion – is itself a commodity.

2. GOLD BULLION: A VERY SPECIAL COMMODITY

2.1. From the foreign mine to importation

Let me consider the following case, used by Ricardo in Chapter XIII "Taxes on Gold" of *Principles*. Gold bullion is produced by the competition of capitals in the Spanish-American colonies, where its natural price is P_{nG}^p in pesos per ounce and its quantity varies with the productivity of the mines. In England gold is the standard of the currency and a circulating medium in the form of coins which are legal tender at a legal price $\overline{P_{GC}}^{\pounds}$ per ounce. The English demand for Spanish-American gold for the purpose of coining is not for a given quantity (contrary to corn required to feed the population) but varies inversely with the value of gold:

If gold were of double the value, half the quantity would perform the same functions in circulation, and if it were of half the value, double the quantity would be required. (*Principles*; I: 193)

The import trade of gold bullion in England is implemented by capital that requires a profit at the English general rate r . Calling P_G^P the market price of an ounce of bullion in Spanish America (in pesos), P_G^{\pounds} its market price in England (in pounds), $e^{\pounds/p}$ the exchange rate of £1 against *pesos*, and c_{GM}^{AL} the cost of transfer of bullion from America to England (in percentage), competition ensures that bullion is imported if:

$$(2.1) \quad (1/e^{\pounds/p}) P_G^P (1 + c_{GM}^{AL})(1 + r) = P_G^{\pounds}$$

The market price P_G^P in America gravitates around the natural price P_{nG}^P which is determined by the cost of production with the portion of capital that pays no rent. If a new mine is discovered, more productive than one or more mines previously worked, the adjustment is as follows. The increase in the aggregate quantity of bullion sinks its market price below the initial natural price, and one or more mine(s) become non profitable (at the general rate of profit in Spanish America). Ricardo assumes that these mines are closed down successively, according to their ranking by productivity. Each time a mine is closed down, the aggregate quantity of bullion is reduced and the market price increases, until the latter agrees with the cost of production in the least productive profitable mine. By construction, this cost is lower than the initial one and the natural price P_{nG}^P is lowered, as compared with the situation before the discovery of the new mine. This adjustment may be formalised, on the basis of the example given by Ricardo in Chapter XIII of *Principles* (see Deleplace 2017, Chapter 5). In (2.1) P_G^P may consequently substitute for P_{nG}^P .

Two remarks can be made on this adjustment. First, assuming that during the adjustment the total quantity of gold produced is *not* reduced because each mine previously worked lowers its production *but* because some mines completely close down while others keep their initial level of production implies that no assumption about constant returns is necessary: each mine eligible to go on being worked produces the same quantity of gold with the same capital as before, hence at the same cost. As is well known, the question of whether it is or not necessary to assume constant returns is a sensitive one in Classical economics. Second, one should assume that the change in the natural price of bullion does not alter the ranking of the mines according to their productivity. Supposing that gold is not a wage-good or used to produce wage-goods, a change in its natural price does not modify the level of the general rate of profit in Spanish America. The ranking of the mines by their physical productivity is thus exempt from the effect of a change in the distribution of income, and the order in which they should close down successively is hence unaffected by the adjustment consequent upon the discovery of a new mine. In the terms of Sraffa (1960), gold bullion should be non-basic in Spanish America.

Assuming that it is also non-basic in England guarantees that a change in P_{nG}^P does not affect the natural rate of profit r in this country. The question is now that of the behaviour of P_G^{\pounds} .

2.2. Convertibility both ways

In a monetary system endowed with convertibility both ways of bullion into coin (at a percentage minting cost s_G) and of coin into bullion (at a percentage melting cost m_G), arbitrage ensures that the following relation applies:

$$(2.2) \quad \overline{P_{GC}}^{\pounds} (1 + m_G) \geq P_G^{\pounds} \geq \overline{P_{GC}}^{\pounds} (1 - s_G)$$

The market price of gold bullion in England P_G^{\pounds} is thus regulated by the legal price of gold in coin $\overline{P_{GC}}^{\pounds}$, for given minting and melting costs. This has two analytical consequences. First, the market price of the standard was affected by the laws governing convertibility both ways between the standard and coin (seignorage, prohibition of melting), independently of what happened to the market prices of all other commodities. In other words, as soon as gold bullion became the standard of money, its market price did *not* gravitate around its natural price – as was the case for all commodities to which the competition of capitals applied – but was stabilised thanks to an adjustment process *sui generis*, which depended on the monetary system. As emphasised by Ricardo in evidence before the Commons' Committee on Resumption on 4 March 1819:

In a sound state of the currency the value of gold may vary, but its price cannot. (V: 392)

The second consequence is that, from a theoretical point of view, the commodity acting as the standard of money resembles all other commodities in that it has two prices, one regulating (in Ricardo's parlance) the other. For any commodity produced in competitive conditions there exists a natural price which regulates its market price (according to the so-called "gravitation"). For the standard of money there exists a legal price, to which the market price adjusts. However, this resemblance conceals a crucial difference. The natural regulating price of any commodity can be determined independently of the market process, that is, independently of any theory of the market price. In the modern Classical theory of prices to be found in Sraffa (1960) and derived from Ricardo, the determination of the price system requires the knowledge of the technical methods of production and of one exogenous distribution variable, under the assumption of a uniform rate of profit, but no particular theory of the market prices: the only assumption is that the system of (natural) prices is "adopted by the market" (Sraffa 1960: 3), whatever the market process that makes it to be so. Nothing of the kind for the legal price of the standard of money: this institutional datum only acquires an economic meaning because of a specific process which adjusts the market price of the standard to it. Far from being of secondary importance, the adjustment process of the market price of gold bullion makes the legal price effective and therefore constitutes it as an economic magnitude: for want of such adjustment, this datum would simply remain outside of economic theory, and money with it.

2.3. The specificity of the commodity acting as standard of money

Gravitation in Spanish America adjusts P_G^p to P_{nG}^p . Arbitrage permitted by the double convertibility within the English monetary system adjusts P_G^{\pounds} to $\overline{P_{GC}}^{\pounds}$. The following relation thus applies:

$$(2.3) \quad (1/e^{\pounds/p}) P_{nG}^p (1 + c_{GM}^{AL})(1 + r) = \overline{P_{GC}}^{\pounds}$$

Any variation in P_{nG}^p due to the discovery of a new mine or to the exhaustion of existing ones affects the left-hand side of (2.3). Since gold bullion is by assumption non-basic, the rate of profit r in England is not affected, and such variation may only be reconciled with the fixity of the right-hand side of (2.3) through an appropriate change in the exchange rate $e^{\text{£/p}}$. It is the exchange rate that ensures the consistency of a double adjustment of the market price of gold bullion, through the competition of capitals in the gold-producing country and through convertibility both ways in the country using gold as standard of money.

Two symmetrical errors usually stand in the way of a proper understanding of Ricardo's monetary theory: either treating the standard of money (gold bullion) like any other commodity (its market price gravitating around its natural price) or assuming its market price as constant because it is imposed by law. Either way is equally irrelevant since it evacuates the singularity of the standard of money as commodity: the determination of its market price by two apparently contradictory adjustment processes. As a competitively-produced commodity, gold bullion is subject to the competition of capitals and its market price is regulated by its cost of production with the least productive portion of capital, which varies exogenously with the discovery of new mines or the exhaustion of existing ones. The only particular assumption required by Ricardo's analysis of this adjustment is (in modern Sraffian parlance) that gold bullion should be a non-basic commodity so that it affects the rate of profit neither in the gold-producing nor in the gold-importing country. As the standard of money, gold bullion is subject to arbitrage within the monetary system and its market price is regulated by the fixed legal price at which bullion is convertible into money and money is convertible into it, independently of its cost of production. A conclusion emerges: this double regulation of the market price of gold bullion may only be non-contradictory if one assumes that *gold bullion is produced outside of the country in which it is used as the standard of money*. The market price of gold bullion in the foreign producing-country (regulated by the cost of production) and its domestic market price (regulated by the legal price) are linked through the exchange rate.

Being produced abroad was thus for gold bullion *not* a point of fact, consequent upon the absence of mines in England, but a point of theory: the "sound state of a currency" – that is, the self-adjustment of a monetary system endowed with a standard – required this standard to be: a) non-basic, and b) produced abroad.³ In other words, the commodity used as the standard of money in an economy should not be part of the system of production of commodities that determines the relative prices and the distribution of income in this economy.

3. CONCLUDING REMARKS: THE RELEVANCE OF RICARDO'S THEORY OF MONEY FOR TODAY

³ In this sense, Ricardo's famous image of a gold mine being discovered on the premises of the Bank of England (see *Reply to Bosanquet*; III: 215-17) was not appropriate to the understanding of the nature of the standard. This may be the reason why Ricardo only used this image in the Bullion Essays, not in his mature theory of money, which puts the standard centre stage.

Assessing a theory of money that focuses on the standard could as well be for Ricardo the kiss of death. One might ask the question: what is the use of inquiring about the theory of a money anchored to gold, something only few people still advocate today? And this enquiry may not even be useful to them: modern advocates of such system usually develop a *laissez-faire* approach to money, which is at odds with Ricardo's contention that stabilising the value of money requires a legal price of the standard – instead of the value of money being market-determined – and a central bank managing the quantity of money on the basis of the spread between the market and the legal prices of the standard – instead of the note issue being left to free banking. It may thus seem that any attempt at linking Ricardo's theory of money with modern inquiries into monetary questions is doomed to failure.

One may, however, ask the question the other way round. The main lesson of Ricardo's mature theory of money is that a monetary system cannot be stable ("secure") if it is deprived of a standard. Of course, the variability of the value of the standard generates variability in the value of money, but this is the price to pay for avoiding a greater instability in the value of money, due to a poorly designed monetary system. Ricardo showed with the Ingot Plan that the value of notes issued through monetisation of capital (discounting of commercial bills) could be stabilised under the condition of being anchored to a standard and managed properly. If this analysis is considered as valid, the next step is to inquire into the standard that should be designed to obtain the same result in a modern economy. In the historical conditions of the time, Ricardo considered a metallic standard. While it had been recognised for long that the legal price of the standard in coin should not be arbitrarily changed by the State, the Bullionist Controversy showed that debates were still raging about the conditions under which the market price of the standard could be stabilised so as to eliminate the causes of variability in the value of money that had a monetary origin. The merit of Ricardo was to clarify this issue by showing that convertibility between one circulating medium (the note) and the other (the coin) was not appropriate: "a sound state of the currency" required the euthanasia of metal currency⁴ and the implementation of the ingot principle – convertibility both ways between the sole currency (the note) and the standard itself (bullion) – coupled with the management principle – expansion or contraction of the note issue according to the market price of the standard being below or above its legal price.

These conditions for "a perfect currency" in no way require the standard to be metallic: any marketable asset that is legally convertible into money and into which money is legally convertible at a fixed price may play the same role, provided that it does not belong to the system of production of commodities. Instead of a physical commodity, the standard might be a financial asset, the value of which is determined by the anticipation of future returns. Both conditions – being outside the system of production of commodities and being a financial asset – would be fulfilled by a public bond purchased and sold for money by a central bank at a fixed price and traded on a secondary market – a situation not far from that of our modern economies in times of deflationary crisis and non-conventional central bank policy. When, for example, the European Central Bank announced that it was prepared to purchase any amount of the sovereign debt issued by a given State, as long as the market interest rate on that debt stayed above a predetermined (although undisclosed) level – in other

⁴ This expression was used by James Bonar in his "centenary estimate" of Ricardo's Ingot Plan (Bonar 1923).

words as long as the market price of that debt stayed below a predetermined level – it did the same as Ricardo’s central bank which was to enlarge its note issue as long as the market price of gold bullion fell below its legal price. There are of course important differences – the benchmark interest rate remains secret and this non-conventional policy is supposed to be abandoned sooner or later – but it is a step in Ricardo’s direction.

The substitution of a public-debt standard for the gold-bullion standard would marry the ingot principle of the currency adapted from *Proposals* with open-market operations suggested in the *Plan for a National Bank* (published posthumously in 1824), so that the note issue would vary according to the spread between the rate of interest on the secondary market for public debt and the legal rate of interest on this debt. The analytical condition for such an approach to central banking is of course to formalise the link between the quantity of central bank money issued and the price of public securities, a question at the heart of modern monetary theory.

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