Interest rate, banking theory and monetary policy in Ricardo's economics

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Introduction

I would like to show that Ricardo's banking theory is related to his interest rate theory. This statement logically implies that he promotes an original view of the role of banks. This will allow me to reconsider the type of monetary policy proposed by Ricardo and the interpretations that have been made with respect this policy (Arnon, 1987; Davis, 2005; Sayers, 1953).

He refers to a natural and market rate of interest on the capital market. There is no bank credit market and no money market as a special market for liquidity for banks. His National Bank is not lending but issuing money by buying gold, and it does not bring a Bank rate monetary policy into operation. His mention of an open market policy in 1823 is neither related to a base money policy nor to a lender of last resort policy, although it permits a flexibility of the supply of money without "discretion", but within a set of rules.

I will present the paper in three steps. First, I will present Ricardo's theory of the interest rate. Then I will discuss Ricardo's banking theory and finally I will show that Ricardo's ideas about the reform of the British monetary system and the creation of a National Bank and its monetary policy proposed a way of implementing these theories.

For these three points, I will examine Ricardo's statements from 1811 to 1823, which present a consistent and rather unmodified theory. Along the way, we will discuss the Ricardian legacy in these topics, for example in Wicksell.

1. Ricardo's theory of the interest rate

According to Ricardo, there is only one overall view of the interest rate, that is, either as a natural or a market interest rate. These are related to the capital market. The banks' credit rate is no different from the rate on the capital market.

a) The interest rate is determined by and equal to the rate of profit on capital in real terms over the long term. This is called a "natural interest rate". So, at this rate, there is an equal balance between investment and saving. This rate depends on the quantity of capital and not on the quantity of money, a fact that Ricardo constantly stated from 1810 to 1817 (Ricardo, 1810, p. 273; Ricardo, 1811, pp. 88-89; Ricardo, 1817, chap. 21 and 27)[1].

"The interest for money … is not regulated by the rate at which the Bank will lend […], but by the rate of profits which can be made by the employment of capital which is totally independent of the quantity of money or of the value of money."(Ricardo, 1817, chap. 27, p. 363)

It is not necessary, on the theoretical level, to introduce a "market of money loans" (as money is only the medium through which one can acquire capital). Nevertheless, Ricardo notes that, on a "practical" level, to observe the interest rate "given for the use of money" on this market could help us to have some idea of the rate of profits, as Adam Smith had suggested (Ricardo is summarising Adam Smith on this point).

"Adam Smith has justly observed that it is extremely difficult to determine the rate of the profits of stock. […] [H]e suggests that "the market rate of interest will lead us to form some notion of the rate of profits, and the history of the progress of interest afford us that of the progress of profits." Undoubtedly if the market rate of interest could be accurately known for any considerable period, we should have a tolerably correct criterion by which to estimate the progress of profits." (Ricardo, 1817, chap. 21, p. 296)

But, Ricardo underlines that, in many countries, the State has prevented the existence of a free market of interest by establishing a maximum rate of interest. As a result, this rate fixed by

[1] According to Schumpeter (1854, p. 720- 722), this is a characteristic of the Classical School.

law provides false information, although it is often the only information at our disposal[2]. So in fact, we do not know what the actual market interest rate is. For example, during the war at that time (and because of the situation of war), since Exchequer and Navy bills were discounted, this gave their buyers 8% for their money and individual agents were obliged, by indirect means, to borrow at more than 10% when the legal interest rate was 5% during the same period.

The price of the funds was regulated by the general interest rate given on money (Ricardo, 1811, p. 93). However, according to Ricardo, their price is not a good criterion by which to judge the interest rate. This is because the stock market is so loaded with government loans in times of war, and in times of peace lenders are not willing to divert their funds from the employment to which they are accustomed. As a result, their price is never fixed at a fair level, and the interest rate on these securities is generally not equal to the general market rate (Ricardo, 1817, p. 298). For these reasons, the interest rate determined on the stock market is not relevant for Ricardo.

b) There is a temporary variation of the market interest rate from its long-term level (the rate of profit) or its "natural level". However Ricardo does not describe this variation by way of a determination of this market interest rate on a market for loans (or loanable funds). The latter is not relevant to Ricardo's economics.

On this point, we can compare Ricardo's economics with T. Tooke's interest rate theory, which makes an important contribution to the determination of the interest rate on a loanable funds market (Tooke (1826)). According to the latter, the rate of profit is estimated in kind, and the rate of interest is calculated in money. Tooke believes that it is a fundamental error of the doctrine that this consideration has been overlooked (Tooke, 1826, p. 9). Tooke wishes to examine in what respect the interest rate is an index of the rate of profit[3]. Of course, he says, the average interest rate may have some incidence on the rate of profit, because it indicates

[2] "In all countries probably these laws are evaded, but records give us little information on this head, and point out rather the legal and fixed rate, than the market rate of interest…Little dependence for information then can be placed on that which is the fixed and legal rate of interest, when we find it may differ so considerably from the market rate….Adam Smith thinks the legal rate followed, and did not precede the market rate of interest." (Ricardo, 1817, p. 297). Ricardo does not mention that Smith was in favour of an interest rate regulation.

[3] "The commonly received opinion and that which is generally adopted by political economists is, that the rate of interest is governed by the rate of profit". Tooke then illustrates this opinion by a quotation from MacCulloch, in his article "Standard of National Prosperity", in the Edinburgh Review, n° 79, pp. 8-9, which follows the Ricardian tradition (Tooke, 1826, p. 6).

the degree of expectation on profit and these expectations are realized over the long term. However, this is practically useless for periods of, for example, ten years, when the rate of interest is not always related to the rate of profit (ibid., p. 7). He distinguishes between monied capital (which is lent on securities) and currency (which is a means of transactions for commodities); the rate of interest is determined by the confrontation of the supply and demand of monied capital (ibid. p. 11). Lenders and borrowers are classified according to their levels of risk. In this framework, what are the consequences of an increase in circulation? As every increase of paper is issued by way of loans, "it cannot enter into circulation other than by reducing the interest rate, when all other factors remain the same…" (ibid., p. 23). Therefore it seems to have a temporary effect on the interest rate first, before it "can be traced to the prices of commodities" (ibid. p. 23) [4]. However, this will also induce those with capital to take more risks (make "hazardous" investments) in order to maintain their income and it will lead the borrowers to extend their borrowing at a reduced rate (ibid., p. 21). Also, if this coincides with a speculative anticipation (due to other causes (Béraud, 2009)) in which the prices of commodities are rising, this will cause a greatly increased demand for loans from a higher risk class of borrowers (ibid. p. 24). Tooke quotes Adam Smith on the subject of "overtrading" (ibid. p. 25). For Smith, overtrading corresponds to a situation where there is a disequilibrium between investment and saving due to "projectors' behaviour". A. Smith has shown that this process ends in the destruction of capital and credit. In summary, according to Tooke, the increase of the demand of loans will be combined with a reduced supply and both will contribute to a great increase of interest, which may be above the former level, and will not involve a return to equilibrium[5]. That is why he was in favour of a monetary policy with a discretionary discount rate from the Bank of England, in order to limit interest rate fluctuations such as these.

[4] "When the amount of the circulation has become settled , for any length of time, at a particular level, …: the rate of interest will then be governed entirely by the supply and demand for capital as resulting from circumstances independent of the currency." (ibid. p. 23).

[5] "Thus, while the demand for capital is increased in a very great degree, the supply of it is diminished, not only relatively to the increased demand, but to the former amount of supply" (ibid., p. 27).
I partly disagree with Arnon (1991, p. 86). On the one hand, he underlines that, concerning "his sophisticated theory of the rate of interest" in his (1826) pamphlet, "Tooke places himself outside the mainstream of classical thought by suggesting that monetary phenomena have an effect on the real side of the economy". Yet, on the other hand, he considers Tooke to follow Ricardo, since an increase in the circulation can only create a temporary disturbance and the rate of interest cannot move away from the rate of profit for long. In fact, I think that Tooke is persuaded that the disturbance is durable.

In Ricardo, this temporary deviation of the market rate from its natural level is sometimes, but not always, due to the variations in the quantity of money. It is in fact related to the more general mechanism for the regulation of commodity prices.

- The first cause of this deviation is a variation of the quantity of money and this is regulated by the quantity theory.

This is the case in Ricardo (1811). At that time, Ricardo considered that the only perturbation to the interest rate level was due to the variation of the quantity of money, whether it was an increase in the amount of banks' loans in notes or a discovery of a new gold or silver mine. Therefore, the way it is introduced into circulation (by banks in particular) does not really matter.

"I do not dispute that if the Bank were to bring a large additional sum of notes into the market, and offer them on loan, but that they would for a time affect the rate of interest. The same effects would follow from the discovery of a hidden treasure of gold or silver coin. If the amount were large, the Bank, or the owner of the treasure 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 price 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 issues." (Ricardo, 1811, p. 91)

In 1811, the regulation is at work through the rise of the prices of commodities which result from the increase of purchasing power due to the rise of the quantity of money ("they would be sent into every market and would everywhere raise the price of commodities").

We find the same in Ricardo (1817, chapter 21, pp. 297-298).

"the rate of interest, though ultimately and permanently governed by the rate of profit, is however subject to temporary variations from other causes" (Ricardo, 1817, p. 297)

"If by a discovery of a new mine, by the abuses of banking, or by any other cause, the quantity of money be greatly increased, its ultimate effect is to raise the price of commodities in proportion to the increased quantity of money; but there is probably always an interval, during which some effects is produced on the rate of interest" (Ricardo, 1817, p. 298).

Money has an effect on the interest rate only during the time of regulation by the quantity theory. Davis (2005, p. 9) considers Ricardo to have completed Hume's mechanism through this variation in the rate of interest.

- In Ricardo (1817, pp. 297-298), there is another cause of deviation and another regulation mechanism: this is the general principle of fluctuations in the market prices of commodities. The interest rate will vary during the "time of this fluctuation".

Market prices of commodities vary in proportion to supply and demand. In the event of a fall in prices due to an abundant supply or a decrease in demand, it is possible that the manufacturer will borrow to meet his usual payments, preferring not to sell at reduced prices. This will entail a rise in the demand of credit and a rise in the interest rate. However, the market price will soon increase and return to its former level and the demand for credit will fall, as will the interest rate. Therefore this variation in the interest rate is only temporarily different from its permanent level, which equates to the rate of profit – that is, it lasts as long as the market price fluctuates either side of the natural price of commodities. And, if there is a permanent fall of demand in this industry, the manufacturer "no longer resists the course of affairs: prices fall, and money and interest regain their real value" (Ricardo, 1817, p. 298).

In this mechanism, we find that the interest rate will vary in contradiction with the rate of profit. If market prices fall below their natural level in an industry, Ricardo says that the rate of interest will temporarily rise (although the market rate of profit will fall in this industry).

- Following the same line of thought, in his letter to Grenfell (on the 27th of August 1817, reprinted in Heertje A., 1991, pp. 520-523[6]), Ricardo considers the question of the variations of the "market rate of interest for money". Normally, permanent causes that lower the rate of profit (such as accumulation of capital and population) permanently lower the natural interest rate. In addition, there are temporary factors that make the market rate of interest vary from this natural level for a certain period of time, after which it returns to its natural course. This is notably the case during the period commencing from the end of the war and throughout the transition from war to peace. This is due to the fact that, on such occasions, there has been a great disruption in the different uses of capital and an unusual quantity of capital has been thrown into the market to seek new occupations. Hence the usual mechanism at work in capital movements from one employment to another is "delayed" and takes more time; this situation represents a "friction of the machine" (ibid. p. 521).

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[6] This letter was in Lord Grenville's library. It can now be found in the British Library under the heading of "Dropmore manuscripts" and has been published by A. Heertje in *History of Political Economy*, 1991, 23: 3.

"Although there is no amount of capital which may not be employed in a country there is probably an interval while it is seeking its ultimate destination, during which it particularly operates on the interest. May we not be experiencing such an interval now, when so different a direction is given to capital from the change from war to peace?" (ibid. ,p. 521).

In a letter to Malthus on the 21st of October 1917 (Ricardo, 1966, 7, p. 199, quoted by Heertje A., 1991, p. 523), concerning this question, Ricardo indicates that there can be a divergent evolution in the rate of interest with respect to the rate of profit, since a low rate of interest is compatible with a high rate of profit "when capital is moving from employments of war to those of peace".

Therefore there is no specific market for determining the rate of interest and its fluctuations. The latter refers to the capital market and the mechanism of regulation of the market prices of commodities. This will be a constraint for the role of banks.

2. Ricardo's banking theory

On the one hand, Ricardo is stating that the banks' credit market does not need to be taken into account since the way in which money is borrowed is irrelevant. Money is a means of exchange of commodities. In fact, for him, it is possible to abolish financial intermediation. Lending by banks can be ignored. Banks are unnecessary in the general mechanism of regulating the prices of commodities. On the other hand, Ricardo also states that banks can be dangerous when they decide to fix their rate of interest too low, below the long-term market rate, thus disturbing the regulation mechanism that we covered above.

a) Banks are unnecessary

The relevant rate of interest is the rate on capital loans but not on bank credit. The "market rate of interest and profit" (in Ricardo's terms) does not depend on the "issues of money and on the channel through which it is issued" (Ricardo, 1817, p. 363).

In Ricardo (1817), chapter 4, "On natural and market price", p. 89, Ricardo indicates that the change in the employment of their capital by the employers of stock, withdrawing from a less profitable trade and investing in another more profitable one, will be made through the aid of the "monied class" who is engaged in no trade, but who live on the interest from their money and discounts bills, or make loans. He recalls that bankers do the same. These are the

principles that allow capital to be apportioned to each trade in the precise amounts that are required.

Ricardo agrees that the demand for money at the bank depends on a comparison by borrowers between their rate of profit and the rate of interest at which they can borrow (Ricardo, 1817, p. 364). However, it is always possible to borrow on the market (and not from banks) if borrowers want to pay the market rate.

"This, however, is to suppose that money could not be borrowed if the bank did not lend it… But as a country would have no deficiency of cloth, of wine, or any commodity, if they had the means of paying it, in the same manner neither would there be any deficiency of money to be lent, if the borrowers offered good security and were willing to pay the market rate of interest for it." (Ricardo, 1817, p. 363)

In Ricardo (1810), p. 281, he states that it makes no difference whether those who save lend the money themselves or have a banker lend their money for them, because a pecuniary revenue can never be obtained in the form of money, but by hoarding.

Ricardo (1811, Appendix, p. 126) indicates that banks, through their intermediation, may make excessive profits by lending. Therefore it would be better to rely on the direct financing of shareholders' savings to producers, because, in the latter case, interest would be paid to the owner of the real capital, or else it would be paid as dividends to the owner of the banks (which is unjust according to Ricardo).

As we will see below, in his Plan for a National Bank, he was to implement the same principle. The only role of the public bank he wanted to establish was that of issuing money, but not lending it. If this Bank replaced the Bank of England, this would not preclude merchants from borrowing money from elsewhere. Further, we will explain how the right quantity of money according to the needs of trade was to be determined and issued by this Bank.

"After a well regulated paper money is established, these (-the whole business of the whole community- SD) can neither be increased nor diminished by the operations of banking….; and it is probable, too, that the same amount of money might be lent, not always at 5 per cent indeed, at a rate fixed by law, when that might be under the market rate, but at 6, 7 or 8 per cent, the result of the fair competition in the market between dealers and the borrowers. " (Ricardo, 1817, p. 365)

Of course, banks are unnecessary for lending capital, but they are also unnecessary for short term or commercial credit. Since banks are supposed to lend at the market rate of interest,

what is the advantage of borrowing from them? It is therefore not necessary to distinguish a discount market or a bank credit market from the capital market.

That is why Ricardo is sceptical about the advantages to be gained by means of cash accounts accommodation derived by merchants from the Scotch bankers that Adam Smith refers to. Ricardo considers that the quantity of money that might be advanced and put into circulation is a given amount. Therefore, whether it is advanced via discounting by banks or by means of cash accounts credit is of no importance. One mode of circulation will substitute the other. The way banks are lending is not relevant.

"…but, as the banker, in proportion as he advances money and sends it into circulation in one way, is debarred from issuing so much in the other, it is difficult to perceive in what the advantage consists. If the whole circulation will bear only one million of paper, one million only will be circulated; and it can be of no real importance either to the banker or merchant, whether the whole be issued in discounting bills or a part be so issued and the remainder be issued by means of these cash accounts." (Ricardo, 1817, p. 366).

We will see below, in section 3, that the National Bank that Ricardo wants to create, according to his plan, is the sole issuer of money but does not provide loans. Other banks will only give credit but not issue money. In this line of thought, banks are lending the money again or reintroducing the money that has been issued previously from another part of the economy. Thus, they increase the speed of circulation of this money.

Ricardo's criticism to Smith is noteworthy. It draws the line between himself and another tradition based on Smith and which was to continue with Thornton and the Banking School (Skaggs, 2003; De Boyer and Diatkine (2008)). The latter, on the contrary, will insist on the role of banks in both discounting bills and lending money, and on the importance of the credit and money markets and the banks discount rate.

b) Banks are dangerous

- According to Ricardo, when banks are issuing money through lending, it is possible for them to overissue. If banks increase their monetary loans, this will not entail a permanent variation of the interest rate; instead, this will result in a depreciation of the value of money[7]. According to Ricardo, if banks could permanently affect the rate of interest, this would give

[7] "Whether a bank lent one million, ten million, or a hundred million, they would not permanently alter the market rate of interest; they would alter only the value of the money which they issued." (Ricardo, 1817, p. 363-364).

them too great a power, because this would reduce the rate of profit. Hence this conclusion must be excluded because it would contradict his own theory of the rate of profit.

"To suppose that any increased issues of the Bank have the effect of permanently lowering the rate of interest, and satisfying the demands of all borrowers, so that there will be none to apply for new loans, or that the productive gold or silver mine can have such an effect, is to attribute a power to the circulating medium which it can never possess. Banks would, if this were possible, become powerful engines indeed. By creating paper money, and lending it at three or two percent under the present market rate of interest, the Bank would reduce the profits on trade in the same proportion; and if they were sufficiently patriotic to lend their notes at an interest no higher than necessary to pay the expenses of their establishment, profits would be still further reduced; no nation but by similar means, could enter into competition with us, we should engross the trade of the world. To what absurdities would not such a theory lead us! Profits can only be lowered by a competition of capitals not consisting of circulating medium." (Ricardo, 1811, p. 92).

- However, for the last twenty years, banks have been lending and giving money at a rate of interest fixed by law below the level of the market rate which is the rate at which the merchants would have borrowed elsewhere (Ricardo, 1817, p. 364). In maintaining bank rates below the market rate, banks can lend an infinite quantity of money. This leads Ricardo to criticize the Bank of England's and other banks policy[8] (ibid, pp. 364-365). In so doing, banks counteract the regulation of the prices of commodities, that is, their equalization to their natural prices and at the same time the equalization of the rate of profit to its natural level. The situation is the same when a merchant permanently supplies a commodity at a price under the market price that is lower than its cost of production.

"What would we say of an establishment which should regularly supply half the clothiers with wool under the market price? Of what benefice would it be to the community? It would not extend our trade, because the wool would equally have been bought if they have charged the market price for it. It would not lower the price of cloth to the consumer because the price …would be regulated by the cost of production to those who were the least favoured." (Ricardo, 1817, p. 364)

This would only redistribute profits between industries or between merchants within one industry. Those who benefit from this lower price (the buyers) will see their profits rise above the general level in the economy and others will experience a decrease in their profits below the general level.

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[8] "… ; but I confess that to me seems rather an objection to their establishment than an argument in favour of it." (ibid., p. 364).

"Its sole effect then would be to swell the profits of a part of the clothiers beyond the general and common rate of profits. The establishment would be deprived of its fair profits, and another part of the community would be in the same degree benefited." (ibid.)

This is the same in the banking industry[9]. By fixing the rate of interest below the market rate, banks will disturb competition in the market, as well as the regulation of the prices of commodities.

Therefore, in Ricardo, there is only a market rate of interest that cannot permanently deviate from its natural level or from the rate of profit. Its movement is described by the common analysis of the regulation of commodities prices. The market rate of interest is determined as any commodity price is determined.

"In another part of this work, I have endeavoured to shew, that the real value of a commodity is regulated not by the accidental advantages which may be enjoyed by some of its producers but by the real difficulties encountered by that producer who is least favoured. It is so with respect to the interest for money." (Ricardo, 1817, p. 363)

As a result, a bank credit rate is not different from such a market rate. We may ignore banks. A central bank discount rate is not relevant and cannot be a tool for monetary policy.

This rate of interest is not involved, and does not have to regulate the balance of trade through international capital movements and exchange rates. This is because, in Ricardo, the regulation of the balance of trade refers to the "price specie flow mechanism".

As regards Ricardo's analysis of the rate of interest, it is important to discuss Wicksell's criticism. It is important because, although the latter considered himself to be following and refining the Classical analyses – especially Ricardo's – he stresses the banks credit rate and introduces the credit market. Some commentators consider Wicksell to be a follower of Thornton (Humphey, 1990) and others see him as a follower of Ricardo (Ahiakpor, 1999).

c) Wicksell and Ricardo

[9] "Now this is precisely the effect of our banking establishments; a rate of interest is fixed by the law below that at which it can be borrowed in the market and at this rate the Bank are required to lend, or not to lend at all….and a part of the traders of the country are unfairly, and for the country unprofitably benefited, by being enabled to supply themselves with an instrument of trade at a less charge than those who must be influenced only by market price." (Ricardo, 1817, p. 365).

- According to Wicksell, there is no convergence of the market rate of interest to the natural rate and they may diverge permanently and in a cumulative way. On the one hand, he underlines the importance of Ricardo's analysis (Wicksell, 1898, pp. 81-82; see also Eberling (1999)).

But, on the other hand, Wicksell (1898, p. xxiv) stresses that, according to Ricardo, in order to bring about a permanent fall in the rate of interest, the excess of money would have to be constantly renewed; Ricardo himself insisted this can only be a temporary phenomenon.

He also shows that Ricardo's analysis contradicts itself (Chiodi, 1991, pp. 9-12).. First, according to Wicksell, if the reduction in interest rate (in order to bring into circulation the increased volume of money, as is assumed by Ricardo) was to result in lower costs of production and consequently lower prices, then the demand for credit instruments would be diminished and not increased, and the money would flow back into the banks. Hence, the banks cannot increase the volume of circulation. "If this point of view is not to be self contradictory we must assume that a spontaneous lowering of the loan rate by the banks – i.e. a lowering not caused by a fall in the real rate of interest- will produce higher costs and higher prices so that the ability of the country to export abroad will be diminished and not increased. And this is in full accord with Ricardo's view …that an increase of bank notes ….leads to an outflow of metal and an inflow of foreign goods…But Ricardo's argument by no means explains why, how and to what extent a lower rate of interest has this effect, which is the essence of the problem." (Wicksell 1906 (1935), p. 181)

Moreover Wicksell precisely criticizes the way in which Ricardo demonstrates that a permanent fall in the rate of interest is impossible because he "attempts a further proof by a *reductio ad absurdum* which is much less convincing" (Wicksell, 1906 (1935), p. 179). According to Wicksell, Ricardo's whole argument, in Ricardo (1811, p. 92) that the permanent lowering of interest rates would force down business profits (see above on p. 10) and "would improve the competitive powers of the country in general is in complete conflict with the well-known theory of international trade which Ricardo himself later adopted and which bears his name" (Wicksell, 1906 (1935), p. 180). This would contradict his theory of

international trade regulated not by absolute costs but by relative costs. And a fall in the rate of interest cannot cause a fall in the prices of all of the commodities in the country[10].

- Most of all, Wicksell is criticizing Ricardo for not taking banks into account. Of course, in 1898 (1898, p. 81), he does consider that Ricardo should be credited for having answered in the affirmative to the question as to whether it is in the banks' power to regulate the exchange value of money at will, however:

"He never examined in detail by what means the banks could succeed in putting a larger amount of their stocks in money or notes into circulation and especially what effects the lowering of the loan rate would have on the demand for credit instruments and on the level of prices." (Wicksell, 1906 (1935), p. 178)

Wicksell is thus stressing the fact that banks are issuing notes through loans, and as a result, the important variables are the demand for credit and the loan rate, not the quantity of money (ie. the demand for money) but the demand for credit.

"In other words, the real cause of the rise in prices is to be looked for, not in the expansion of the note issue as such, but in the provision by the Bank of easier credit, which is itself the cause of the expansion." (Wicksell, 1898, p. 87)

Wicksell defines the natural rate as the one which would be "neutral in respect to commodities prices" and also as the one which would be determined if all lending were effected in real capital goods (ibid., p. 102). However, in a world with developed bank credit, there could be a "difference between the rate of interest obtainable by direct lending to others and the rate paid by the banks to depositors" (1898, p. 105). Ricardo makes no difference between theses two rates because he is speaking from the point of view of a world without bank credit and in which there is only direct lending. Wicksell is stressing that, in Ricardo, the rate of interest is the one that is concerned with a supply and demand of capital in real terms (Wicksell, 1906 (1935), p. 179). It is therefore my opinion that, along the way, Wicksell has pointed out what Ricardo's view of the natural rate is and how it corresponds to an economy in which banks are unnecessary (see above, p. 7).

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[10] " …as far as …the resulting reduction in rates of interest and profits are concerned, this certainly produces a cheapening of those articles for the production of which an especially large amount of capital is required, but also *eo ipso* an increase in the cost of articles which require comparatively little capital….a fall of profits of capital is, as Ricardo so clearly shows elsewhere, the same as increased share of labour in the product…make all those goods dearer which are mainly the product of manual labour and do not require the employment of much capital. A fall in the rate of interest caused by increased capital wealth thus causes fluctuations in the relative prices of both these groups of commodities but cannot exercise a depressing influence on the general price level …" (Wicksell, ibid., p. 180).

3. The National Bank and monetary policy

However, although on the one hand Ricardo is criticizing and reducing the role of banks as we saw, on the other hand it is particularly striking that he is also pointing out the importance of one bank in his plan to reform the British monetary system. What kind of bank? The principles of this National Bank were to be in accordance with his theory concerning the rate of interest and banks, as was presented above. This National Bank would not lend, but issue money while buying gold. As a consequence, it does not have to support the whole credit system or be a lender in last resort.

According to Ricardo, the main problem is overissue, because banks can abuse their power of issue[11]:

"There is no point more important in issuing paper money, than to be fully impressed with the effects which follow from the principle of limitation of quantity" (Ricardo, 1817, p. 353)

So the sole objective for monetary policy is to secure the value of money in limiting the quantity of money by a technique involving its regulation, according to the value of the metal that is declared to be the standard. In this respect, there can be some flexibility in the supply of money, but no discretionary policy for the Bank and no Bank rate policy.

a) By issuing money, the National Bank does not have to lend it.

As money is only a means of exchanging commodities and does not need to be issued through bank credit, the National Bank would not issue money through lending. This would allow it to abolish overissue.

The principles for his National Bank were introduced in Ricardo's works in 1816. They were reprinted (as a big quotation) in chapter 28 of his 1817 book (in its second edition in 1819) and partly modified in 1823. The "National Bank" denomination was introduced in the 1823

[11] "After the establishment of Banks, the State has not the sole power of coining or issuing money. The currency may as effectually be increased by paper as by coin; so that if a State were to debase its money and limit its quantity, it would not support its value, because the Banks would have an equal power of adding to the whole quantity of circulation." (1817, p. 354). "…. Experience, however, shews that neither a State nor a Bank ever had the unrestricted power of issuing paper money, without abusing that power : in all States, therefore the issue of paper money ought to be under some check and control;…" (Ricardo, 1817, p. 356).

"Plan for the Establishment of a National Bank"[12], in which he proposes that it substitute the Bank of England in issuing money. Ricardo had been criticising the Bank of England, whose monetary policy had been pro-cyclical during the Restriction period, thus depreciating the value of money. He also criticised its management of the return to cash payments (Davis (2005), pp. 186-187; pp. 203-204) and for the excessive profits it had made (Ricardo, 1811, p. 229; 1816). Before 1823 he used the term "the Bank" and this could also be the Bank of England.

- It had to be the sole issuer of money ("in town as well as in the country", Ricardo, 1816, p. 114) and a public bank. In that case, the State itself was issuing money. This idea had been present in Ricardo's writings since 1815 (in his 10th September letter to Malthus (vol. 6, p. 268) and in Ricardo (1816), p. 114; (1817), pp. 362-363 and (1823), pp. 282). He was thus in favour of a public monopoly quite early on[13]. Ricardo's argument was that the Bank was getting rich on profits which were a "sort of seigniorage" (Ricardo, 1966, 6, p. 268) and which belonged to the public, and not to "a company of merchants" (1816, p. 114).

As regards country banks, it seems that he did not advocate a deregulated banking system because he favoured prudential regulation. In Ricardo (1816), he suggests that country banks should be obliged to deposit with government funded property or other government securities (" an adequate security for the due performance of their engagements") in some proportion with respect to the amount of their issues, and stamps for their issue of notes could be delivered on the required deposit (Ricardo, 1816, pp. 72-73). He thought such measures would be prudent considering that the country banks' notes forms a part of the circulating medium, and because if they were to fail out of carelessness, their downfall would hurt many people.

Before 1816, and notably in Ricardo (1811, pp. 87-88), he relies on a "regional" adjustment mechanism to regulate the quantity of money. Ricardo acknowledges that there seems to be a competition between Bank of England notes and notes from the country banks. In reality,

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[12] Written in 1823 and published in 1824 by his brother.

[13] P. Sraffa indicates, in his note on "Plan for a National Bank", in Ricardo (1866), 4, p. 273, that in 1814, in his letter of 24th December to Say, Ricardo was already in favour of transferring the profits of issuing paper money to the public, but doubted whether the Government would refrain from abusing this power of issue (6, pp. 165-166). In 1815, he turned to the idea of transferring the power of issue to independent commissioners. In 1822, in the House of Commons, he proposed that the Bank of England should not issue paper money and the profits should belong to the public (5, p. 156 and p. 193).

money throughout the country is dispatched to every region according to its needs, in the same way as it is organised at the international level between different countries. If the available money in a region is too abundant, the surplus will go to another region. The adjustment mechanism is the "price specie flow mechanism" at the regional level, that is, an adjustment by means of a variation of the value of money, relative to the value of commodities. That is why the value of a country bank note in another region is the same as that of a Bank of England note (circulating only in the London district). If there is an increase in the amount of notes issued in London, the value of money will lower in relation to commodities in London and in relation to the value of money in another region and goods will be imported into London district, or country banks will increase the quantity of their own notes, which would be equally as scarce as the Bank of England notes. As a consequence, the rise in commodities prices would be spread throughout the whole country and would not just be localised. Similarly, if fewer Bank of England notes were issued, they would be more valuable than country bank notes and the mechanism would be reversed. Hence, country banks can never increase their circulation unless there is a deficiency in the region that is proportionate to the increase in Bank of England notes, because they "are obliged to give Bank of England notes for their own" and the former would be requested until they attain the same value[14]. In fact, the Bank of England directed the amount of notes that country banks issued (Ricardo, 1811, p. 88). Ricardo therefore underlined the special role of the Bank of England in that respect[15].

In Ricardo's proposals to reform the monetary system, seven commissioners were to be in charge of issuing money (Ricardo, 1816, 1817, 1823). They were only nominated and dismissed by Parliament, and not by the government. According to Ricardo, it is possible to let the State issue money only in a "free country". In this type of country and with the checks and balances that Ricardo introduced, this Bank would not abuse its power of issue.

"Under an arbitrary Government, this objection would have great force; but, in a free country, with an enlightened legislature, the power of issuing paper money, under the requisite checks of convertibility at the will of the holder, might be safely lodged in the hands of

[14] The same rule which obliges the Bank of England to pay its notes in specie and therefore to reduce its circulation would oblige the country banks to adopt the same course, because they have to exchange their notes with Bank of England notes (in fact they pay in Bank of England notes and not in specie). (Ricardo, 1811, p. 88). See also the same idea in Ricardo (1810), p. 336.

[15] "The bank of England is the great regulator of the country paper. When they increase or decrease the amount of their notes, the country banks do the same; and in no case can country banks add to the general circulation, unless the Bank of England shall have previously increased the amount of their notes." (Ricardo, 1811, p. 88).

commissioners appointed for that special purpose, and they might be made totally independent of the control of ministers" (Ricardo, 1817, p. 363)

Currency would only be constituted of notes issued by this National Bank convertible into gold bullion (Ricardo, 1817, p. 361; we will return to the principles of this convertibility below). Coins would no longer circulate (in the early versions of his proposals). Notes issued by other banks would not be issued in the form of money, but as credit instruments (in 1823, he indicated that the latter would disappear). Credit instruments can be used in payments according to usual practice. For this reason, Ricardo considers that the quantity of Bank of England notes necessary for transactions may vary and cannot be known in advance. That is why the latter cannot constitute a rule or objective of monetary policy for the National Bank. Thus, Ricardo is in favour of a flexible currency. For this reason, an optimal reserve ratio – that is, a fixed relationship between metal and notes – cannot be specified and is variable[16].

"Amongst the advantages of a paper money over a metallic circulation, may be reckoned, as not the least, the facility with which it may be altered in quantity, as the wants of commerce and temporary circumstances may require :…." (Ricardo, 1816, p. 55)

We will see below how this flexibility in the supply of money is obtained.

- Substituting a public bank for the Bank of England to issue paper money would also allow the State to reduce the interest it pays on its debt. Therefore, this would also be an advantage to the public.

"…as it would exchange a portion of the national debt, on which interest is paid by the public, into a debt bearing no interest ;…" (Ricardo, 1817, p. 363)

The people will no longer be taxed to pay the interest to raise funds for the State's expenses, as is the case when the Bank of England is lending paper money to the State[17]:

"…, and as the State represents the people, the people would have saved the tax, if they, and not the Bank, had issued this million." (Ricardo, 1817, p. 362)

[16] In the Appendix to the fourth edition to the *High Price of Bullion,* Ricardo specifies that, in his plan, the bank could fix its reserve ratio as it wished, thus allowing flexibility for issuing (Ricardo, 1811, p. 126).

[17] Referring to a numerical example, Ricardo (1817, chapter 28) assumes that a certain sum (one million) is required for the State to equip an expedition. If the State issued one million in paper (and displaced a million in coin) there would be no charge for the people; but if a Bank (for example the Bank of England) issued this million of paper (thereby also displacing a million of coin) and lent it to the Government at a rate of interest equal to the market rate of interest, this will constitute interest charges that would be payed by continual annual taxes, the product of which would be transferred to the Bank. So it would be a better solution if the State issued the million.

This statement is repeated in 1823 (p. 277; p. 281). Yet it seems that, in this later text, what was important to Ricardo was not so much to save a tax charge for the people, as to deprive the Bank of England of the interest it acquires through lending to the government.

As a result, the public bank would not lend its notes to either the State or to the merchants (Ricardo, 1817, p. 365; 1823, p. 282). Being independent from the government, the Commissioners in charge of the issuing of money would be less under the control of the ministers than the Directors of the Bank of England were at that time. The latter had been so frequently induced to increase their advances on Exchequer bills and Treasury bills. According to his plan to reform the monetary system, Ricardo states that if the government wanted money, it should be obliged to obtain it by "taxing the people, by the issue and sale of exchequer bills, by funded loans or by borrowing from any numerous banks which exist in the country; but in no case should it be allowed to borrow from those who have the power of creating money" (Ricardo, 1823, p. 283). The government must give gold to the Commissioners in order to have money (not borrow from them)[18].

- The Commissioners would issue their notes not by lending but by exchanging them for gold bullion (Ricardo, 1816, 1817, 1823). However, the convertibility in bullion had been already introduced in the presentation of his Ingot Plan in the Appendix of the fourth edition of *The High Price of Bullion* (1811). They had to sell and buy gold on the bullion market at prices fixed by the Parliament (a buying price of 3L. 17s. and a selling price of 3L.17s. 10 ½ for an ounce of gold). In buying gold to the public, they issued notes, and by selling it, they contracted out their issues. They did not make any discounts or receive deposits, but transformed bullion into money.

- In Ricardo's proposals, country banks were lending their notes, which are not money. Ricardo is not concerned with this credit system. According to him, money is disconnected from credit. These two operations of banking – that is, issuing paper money and advancing money by way of loans – are not necessarily connected (Ricardo, 1823, p. 276). Therefore, banks do not create money but lend an existing amount of money. Since an equal amount of money would be in circulation whether the issuer was a bank or the State, the amount of the

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[18] Its expenses "would have been really fitted out by the improvement of our system, by rendering capital of the value of a million productive in the form of commodities, instead of letting it remain unproductive in the form of coin." (Ricardo, 1817, p. 362).

advances that depend on this circulation would not be modified. The same amount of circulation could be lent to the merchants (see above, p. 8[19]; 1823, p. 277).

b) The role of the Bank in stabilising the value of money

The sole function of the National Bank is to stabilise the value of money. By means of arbitrages by the public on the gold market between prices at the Bank and prices on the market, the money price of gold bullion is stabilised at the target level (situated within the price bracket established by Parliament) and so is the value of money. Importantly, since the Bank is a public bank and does not have to make profit, the bracket fixed for its selling and buying prices of gold could be very small. At the same time, this means that the quantity of money is stabilised, since bullion is exchanged for paper money (Ricardo, 1816, p. 59; 1817, p. 357).

This system means that the varying money market price of gold (on the bullion market) must equate to the fixed legal price. If the former is above the latter, money is depreciated. As a result, arbitragists will buy gold by giving notes to the Bank in order to sell bullion on the market to make profit; in the process, the quantity of money diminishes and the monetary price of bullion as well (Diatkine, 2008). Consequently, if there is equality, the quantity of money is the "right" one and there is no overissue, but this is only revealed after the price target has been attained.

"…but, while these metals are the standard, the currency should conform in value to them, and whatever it does not, and the market price of bullion is above the mint price, the currency is depreciated. – This proposition is unanswered, and is unanswerable" (Ricardo, 1816, p. 63)

Ricardo does not explain in 1816, 1817 or 1823 what the relationship is between the quantity of money and the price of bullion, or why, when the money is depreciated, the market price of bullion rises[20]. Is it necessary to complete the picture with the mechanism he described in 1811[21]? (Diatkine, 2008; De Boyer, 2011, this conference).

[19] "If, then the State were to issue the paper money of the country, although it should never discount a bill, or lend one shilling to the public, there would be no alteration in the amount of trade;…" (Ricardo, 1817, p. 365).

[20] Ricardo indicates that it is a matter of fact that the quantity of money and the price of gold go together (Ricardo, 1811, p. 90).

[21] There is also a short allusion to this problem in Ricardo (1816, p. 57), where he points out the advantage of issuing paper money and not coins for the convergence of the value of bullion and the value of money. See below, note 23.

Ricardo does not devote much space to explaining why the National Bank is necessary for making the market price of bullion equal to the mint price. In fact, the National Bank had to centralize gold in its coffers (because coins would no longer circulate in the first version of Ricardo's Plan) and be a "major" supplier of gold. We will see below that the Bank can decide of its own accord whether or not to intervene and diversify its instruments, thus accelerating the equalization of gold prices.

c) No discretionary monetary policy

Instruments and objectives were therefore imposed on the Bank and only concerned the gold market and prices on this market. They did not explicitly concern the quantity of money. The Commissioners responsible for issuing money should only regulate their issue by the criterion of the price of gold and without paying attention to the absolute quantity of paper circulation (Ricardo, 1816, p. 64; p. 67; 1823 p. 293). The quantity of money that is needed at any moment cannot be directly known. This was noticed by Ricardo as early as in Ricardo, 1811 (p. 86). So, observing the quantity of money does not give any true information and is not an objective for monetary policy.

Ricardo indicates that this quantity can vary according to the "wants of commerce and temporary circumstances" (Ricardo, 1816, p. 55) and the "degree of economy practised in the use of it" (ibid., p. 58). It depends on the use of credit instruments. In the event of "want of confidence", the use of money will be greater. The supply of money which is needed is not appreciated by the public bank in proportion to the level of output or the macroeconomic situation or according to its own judgment, but it was to be provided by following the same price of gold rules by the bank. This was therefore not a discretionary policy. There is an insufficiency of notes when the value of money rises permanently above the value of bullion and, as a consequence, arbitragists will sell gold to the bank, thus taking notes in exchange and making the quantity of money increase and the value of money decline. For example, when the number of transactions increases owing to the increasing opulence, the value of money will have a higher value, because there is an increase in its use and commodities are bought and sold at lower prices (Ricardo, 1816, p. 56).

"It is the rise in the value of money above the value of bullion which is always, in a sound state of the currency, the cause of its increase in quantity, for it is at these times that either an opening is made for the issue of more paper money, which always attended with profit to the

issuers, or that a profit is made by carrying bullion to the mint to be coined". (Ricardo, 1816, pp. 56-57)

To make the supply of money flexible is also possible for the Bank through a diversification of its instruments of monetary policy, which Ricardo introduces in 1823. Nonetheless, this was not a discretionary policy, because the Bank's objective to regulate the value of money by only watching the price of gold, and not other variables, was still at work[22]. This new instrument was used to accelerate the equalization of the mint price and the market price of gold, when the Bank deemed it useful, and only according to the marker of the price of gold. The bank no longer simply "waits" for buyers or sellers of gold at its desk, but takes deliberate measures.

This new instrument provided the possibility for the Commissioners to buy or sell public securities on the open market (Ricardo, 1823, p. 284). It could first be used if they had a surplus of gold stock and wanted to dispose of it by buying public securities (gold was largely thrown into their coffers, because the public was selling gold to the bank). In this way, they could increase the amount of their issues. Otherwise, they could reduce the amount of their issues by selling securities without diminishing their stock of gold, in the event that money had depreciated. This was a peculiar open market policy, with the aim of achieving greater flexibility for the quantity of money, without "discretion". In short, the bank disposed of two kinds of instruments: selling or buying gold on the gold market, and selling and buying public securities on the open market. Both had the effect of reducing or increasing the quantity of money by regulating the price of gold (Ricardo, 1823, p. 297).

In general, the amount of these transactions would be small, except when there was an increase in the country's wealth, requiring a permanent increase in the quantity of circulation or a permanent decrease in wealth, requiring the opposite remedy. The objective of these operations was not to influence or control the market rate of interest. It did not constitute the beginning of an interest rate policy on the securities market or the money market (contrary to Davis' opinion (1993, p. 199; p. 203)). It is surprising that Ricardo did not mention that this "open market policy" would make the rate of interest vary. He criticised the Bank of England directors for relying on the rate of interest of money as a tool for controlling money issue, arguing that this was not possible (Ricardo, 1966, 5, p. 12). This is because he only took the

[22] Arnon (1987) considers that there was a change to a more discretionary policy.

capital market into account, as we saw above. His only objective was to regulate the price of gold, yet the relationship between the public securities market and the gold market was not analysed.

In this respect, in spite of this open market policy, the National Bank did not have to support the whole credit and banking system of the country. As regards the Bank liquidity risk, owing to the convertibility of its notes into gold, the bank can reduce the outflow of gold by selling public securities. But this risk is reduced through the convertibility to bullion, which limits the demand for gold on a part of the public. Gold is centralised in the coffers of the bank and the regulation of the price of gold occurs so quickly that it can be obtained with very few transactions on the gold market. Ricardo's Plan is not built to deal with times of crisis.

"Under such a system, and with a currency so regulated, the Bank would never be liable to any embarrassments whatever, excepting in those extraordinarily occasions, when a general panic seizes the country, and when every one is desirous of possessing the precious metals as the most convenient mode of realizing or concealing his property. Against such panics, Banks have no security, *on any system*; from their very nature they are subject to them, and at no time can there be in a Bank, or in a country, so much specie or bullion as the monied individuals of such a country have the right to demand." (Ricardo, 1816, p. 68)

However, Ricardo stressed problems to which country banks were subjected in periods of alarm, before the restriction on cash payments, since they must have given guineas on these occasions and these guineas had to be transported regularly from London to the regions (Ricardo, 1816, p. 69). In order to abolish this inefficiency, it was necessary, according to Ricardo's proposals, to give country banks the right either to pay bank notes in bullion or to authorise country banks to pay their notes in Bank of England notes, which would be made legal tender.

In 1816, Ricardo was basing his proposals on the principles of the convertibility of notes into bullion, and not into coins. He seems to justify this by the more rapid equalization of the mint and market price of gold, the latter returning to its former value, which may be obtained when the increase in circulation is not made by means of coins, but only in paper form (Ricardo, 1816, p. 57)[23].

[23] "It appears then, that, if the increase in the circulation were supplied by means of coin, the value both of bullion and money would, for a time at least, even after they had found their level, be higher than before…This inconvenience is wholly got rid of, by the issue of paper money; for in that case, here will be no additional demand for bullion; consequently its value will continue unaltered; and the new paper money, as well as the old, will conform to that value." (1816, p. 57).

In the 1823 version of his Plan, he reintroduced convertibility into coins, perhaps in reaction to the fact that his former Ingot Plan had been opposed. He described a two-level internal organisation of the National Bank. Its headquarters would be in London and there were to be branches in the various “districts”. Only the Commissioners in London would make an original issue of notes. Agents in the districts were to distribute these notes, which would be sent from London such that the public could only have notes if gold or coins had been deposited in London. As a result, Commissioners in London controlled the full circulation of notes within the country[24]. However, it was possible to receive the payment of notes in coins and to have notes exchanged for coins, but only in London. This was to limit the convertibility into coins. The Commissioners in London were obliged to buy any quantity of gold “of standard fineness” at a fixed price and then to issue notes. They thus regulated their issue by the price of gold by buying gold or public securities.

The public bank was not a lender in last resort; it did not have to provide liquidity to banks. This is not a question of fact, but is a logical consequence of Ricardo’s methodology. There is no money market. We saw that he is only speaking of a rate of interest on the capital market, and not of a Bank rate as a specific rate on a specific market. In this respect, Ricardo’s National Bank is not a central bank. His analysis is completely different from that of Thornton and the latter’s tradition, which founded central banking and the lender in last resort. For Thornton, the central bank lends its debt as money; for Ricardo, the National Bank gives its notes as money, but in exchange for gold deposits.

Conclusion

Ricardo constructed an original theory through his reform proposals for the English monetary system. His monetary theory is totally distinct from a banking theory and this is consistent with his interest theory. This analysis is different to both other traditions within Classical monetary economics. Firstly, Ricardo’s analysis is different from certain theories from the Classical tradition, those of Smith, Thornton and the Banking School, which stress the role of

[24] “Agents in other districts in the country, connected with the Commissioners, may give one description of notes for another; they give bills for notes, or notes for bills drawn on them; but in the first instance every one of these notes must be issued by the Commissioners in London, and consequently the whole is strictly under their cognizance. If from any circumstances, the circulation in any particular district should become redundant, provision is made for the transfer of such redundancy to London; and if it should be deficient, a fresh supply is obtained from London.” (1823, p. 296).

banks and the relationship between banking and monetary theory. Moreover, Thornton and the Banking School are in favour of a discretionary policy made by the central bank. But Ricardo's analysis is also different from a second school of thought within the Classical tradition, that of the Currency School, which, like the first, considers banks to be issuing notes through lending, although it offers an answer that is totally different with respect to this problem, since it is in favour of a money base control and strict rules for monetary policy. Nevertheless, the theory does face the problem of bank risks, bank crises and the regulation of credit (which was not dealt with by Ricardo) (Torrens, 1858).

A special place must be attributed to Ricardo as regards monetary policy, because he did not advocate either a money base control, or an interest rate monetary policy. His recommendation was a certain degree of flexibility, with new instruments and no discretionary policy.

References

Ahiakpor J.C.W., 1999, "Wicksell on the Classical theories of money, credit, interest and the price level: progress or retrogression?", *American Journal of Economics and Sociology*, July.

Arnon A., 1987, "Banking between the Invisible Hand and Visible Hands : Reinterpretation of Ricardo's Place within the Classical School", *Oxford Economic Papers,* 39, 1987, pp. 268-281.

Arnon A., 1991, *Thomas Tooke, Pioneer of Monetary Theory,* E. Elgar.

Béraud A., 2009 *Mill, Tooke, MacCulloch et la crise de 1825*, Working paper, University Paris I, May.

De Boyer J. and Diatkine S. , 2008. "British monetary orthodoxy in the 1870s: a victory of the Currency Principle", *European Journal of the History of Economic Thought,* Vol. 15: 2, June.

Chiodi G., 1991, *Wicksell's monetary theory*, MacMillan.

Davis T., 2005, *Ricardo's macroeconomics. Money, trade cycles and growth.* Cambridge University Press.

Diatkine S., 2008, “La politique monétaire selon Ricardo : une comparaison avec l’Ecole de la Circulation “, *Cahiers d'économie politique,* n° 55.

Eberling R.M., 1999, “Knut Wicksell and the Classical Economists on money, credit, interest and the price level: a comment on Ahiakpor”, *American Journal of Economics and Sociology*, July.

Heertje A., 1991, “Three unpublished letters by David Ricardo”, *History of Political Economy*, 23:3, pp. 519-526.

Humphrey T. M., 1990, “Cumulative Process Models from Thornton to Wicksell”, in D.E. Moggridge (ed). , *Perspectives on the History of Economic Thought*, Vol. 4. Adershot. Edward Elgar.

O’Brien D.P., 1994, *Foundations of Monetary Economics*, Vol II, William Pickering, London

Ricardo D., 1810 (1966), *Notes on Bentham* in P. Sraffa (ed.) *The Works and Correspondence*, Volume 3, Cambridge University Press, Cambridge.

Ricardo D., 1811 (1966), *The High Price of Bullion in* P.Sraffa (ed.) *The Works and Correspondence*, Volume 3, Cambridge University Press, Cambridge.

Ricardo D., 1816 (1966), *Proposals for an Economical and Secure Currency, in* P.Sraffa (ed.) *The Works and Correspondence*, Volume 4, Cambridge University Press, Cambridge.

Ricardo D., 1817 (1966), *The Principles of Political Economy and Taxation, in* P.Sraffa (ed.) *The Works and Correspondence*, Volume 1, Cambridge University Press, Cambridge.

Ricardo D., 1823 (1966), *Plan for the Establishment of a National Bank, in* P.Sraffa (ed.) *The Works and Correspondence*, Volume 4, Cambridge University Press, Cambridge.

Ricardo D. (1966) *Speeches and Evidence* in P.Sraffa (ed*.) The Works and Correspondence*, Volume 5, Cambridge University Press, Cambridge.

Ricardo D. (1966), *Letters, 1810-1815* in P.Sraffa (ed.) *The Works and Correspondence,* Volume 6, Cambridge University Press, Cambridge.

Sayers R.S. (1953),”Ricardo’s Views on Monetary Questions”, in T.S. Ashton and R.S. Sayers (eds.), *Papers in English Monetary History*, Clarendon Press.

Schumpeter J.A., 1954, *A History of Economic Analysis,* Allen and Unwin.

Skaggs N., 2003,”Thomas Tooke, Henry Thornton, and the Development of British Monetary Orthodoxy”, *Journal of the History of Economic Thought*, Vol. 25, no. 2, (June).

Smith A, 1776, *An Inquiry into the Nature and Causes of the Wealth of Nations*, edited by R.H. Campbell and A.S. Skinner, Oxford University Press: Oxford 1976.

Tooke T, 1826, *Considerations on the State of the Currency*, 2nd edition (February), London, John Murray.

Torrens R. (1858), "Lord Overstone on Metallic and Paper Currency", *Edinburgh Review*, Vol. CVII, pp. 248-93; reprinted in O'Brien (editor), 1994, pp. 300-345.

Wicksell K., (1898) 1936*, Interest and Prices*, *with an introduction by B. Ohlin*. R.F.Kahn (trad), London, Macmillan. Reprint Mc Kelley. 1962.

Wicksell K., 1906 (1935), *Lectures on Political Economy*, Vol. 2, Routledge and Kegan.