

# Forms of Money and Laws of Monetary Circulation: On the origin of controversies in modern Credit Theory<sup>1</sup>

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## Abstract

The theoretical debates of the Banking and the Currency school is a powerful framework for the study of the dynamics of capitalist production. The origin of these debates cuts across both financial and real sectors and continues to permeate through present monetary controversies. Their debates is applied to a wide range of official statistics and empirically demonstrated. It is shown that Thomas Tooke's classification of different forms of money are crucial and the different functions of money have different explanatory powers for bank reserves, price fluctuations and credit policies. We locate the controversy in the context of statistical data from the resumption of Bank of England specie payment (Gold convertibility) in 1821, to the passing of the Bank act of 1844-45, up to the financial crises of 1866. A synthesis of these seemingly contradictory theories traces its implications for post Keynesian, Monetarist and Marxian economics with applications for Government, Banking and Corporate finance / credit policies.

We conclude: 1). Break down of monetary categories and understanding their different functions and modus operandi is absolutely crucial for analysis of any financial crises. We find that bills of exchange and bank notes are not associated yet the constituent parts of bills of exchange do affect bank note circulation as well as commodity prices. The relation of these two categories was a major point of contention. This result highlights the short coming of any monetary aggregate analysis 2). The volume of bank notes could not explain variation in gold reserves nor fluctuation in price of commodities. 3) The outflow of gold affected interest rate before it could bring the desired effects on prices. This other result invalidates the quantity theory of money.

At the theoretical level we find 1) lack of a *value theory of credit* in Tooke as a major drawback for bridging the gap between the two schools 2) Confusion over different categories of money, subject to different laws of circulation, and its consolidation by the Currency school. This may be interpreted in accordance with Marx's criticism of both the quantity theory and Tooke's price theory position.

## 1. Introduction

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## 1.1 The Legacy of Tooke

Ever since Thomas Tooke's ( 1774-1858 ) demonstration that “ the prices of commodities do not depend upon the quantity of money indicated by the bank notes, nor upon the amount of the whole circulating medium; but that, on the contrary, the amount of circulating medium is the consequence, of prices”<sup>2</sup>, the quantity theory of money espoused by Ricardo and his epigones has been regarded as untenable. The doctrinal situation remained more or less so until the first imperialist war of the 20th century.<sup>3</sup> Wicksell, himself perhaps the most formidable quantity theorist in half a century, considered Tooke “ a formidable champion against whom the Ricardians in their turn could not pit anybody quite equal in stature.”<sup>4</sup> The inflation of price levels associated with the great war and subsequent crises encouraged some criticism of the Tookean position.<sup>5</sup>

Milton Friedman's reformulation of certain older monetary ideas in the days of high Keynesianism as a theory of the demand for money where demand (i.e. the reciprocal of velocity ) could be expressed as ‘ a stable function of a limited number of variables’ and the concept of money as amenable to a reasonably precise definition, became influential during the late 1960s and early 1970s, culminating in the adoption of policies to target monetary aggregates in the pursuit of price stabilization goals by the central banks of several key industrial countries. In the 1980s a variety of measures of monetary velocity experienced large deviations from trend in the industrial world leading to reduced confidence in money income relationship, the ultimate objective of Friedman's hypothesis.

Friedman's case ultimately rested on the correlation between growth rates of money and nominal income thus laying the foundations for an argument claiming a causal connection- based on leads and lags in time- running from money to income meets a challenge on its own ground of statistical correlation.<sup>6</sup> The course of events after 1982 seemed to completely discredit the monetarist ideas when broader monetary aggregates were found actually to *increase* in times of recession and disinflation both in the US and UK. Similarly, rapid growth rates of the published monetary aggregates later in the decade did not lead to inflation.<sup>7</sup> In the early 1980s central banks were forced to abandon targeting both narrow and broad measures of money as a policy technique.

Critics of the quantity theory in the late 20th century come essentially to much the same conclusion, warts and all, as Tooke.<sup>8</sup> The monetarist focus on the properties of the velocity of circulation was, admittedly, a reaction to the received Keynesian doctrine. Conceding the monetarist proposition of a relatively stable velocity of circulation, contemporary Post Keynesians argue that when the money stock consists mostly of the deposit liabilities of various kinds of financial intermediaries, money is created essentially as a by-product of the lending activities of those intermediaries. Increases in bank lending, on the assets side, finances the creation of nominal income which in turn leads residually to an increase in money on the liabilities side of the balance sheets. In other words, causality runs from income to money. This comes to a head on collision with what Friedman and Schwartz in their historical work sought to find correlation between growth rates of a broad measure of money and nominal income.<sup>9</sup>

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<sup>2</sup> Tooke 1844 :123.

<sup>3</sup> Hilferding 1981: 47; Wicksell ( 1958: 69 ) wrote : “ Nevertheless, the view prevailed, supported, as it seemed, by irrefutable experience.”

<sup>4</sup> Wicksell 1958: 69.

<sup>5</sup> For example, the Cunliffe Committee Reports ( Great Britain: Parliament 1918, 1919 ) and T.E. Gregory (1928)

<sup>6</sup> Moore ( 1988: 150-153, 283-286 ) reports causality runs from the monetary aggregates to the monetary base in the USA and not vice versa. Laidler ( 1989: 1158 ) concedes that empirical evidence about the causality between money and nominal income is inconclusive.

<sup>7</sup> Friedman 1988:52.

<sup>8</sup> Wicksell ( 1958:69) concedes that Tooke's thesis ‘ contains a good deal of truth ’ but hastens to add “it tells us, and largely correctly, what the determination of prices does not depend on, but unhappily leaves us ignorant as to what it actually does depend on.”

<sup>9</sup> The narrow and broad definitions of money in the form of M1, M2 M3 is but one example of the modern problems of what constitutes money. See M. Johnson and R. Keleher 1996. *Monetary Policy, A Market Price Approach*, Westport C.T. Quorum books. pages 22-23.

Targetting monetary aggregates mandated by US congress in 1978 (Humphrey - Hawkins Act 1978) is a modern revival of the Currency school's point of view.

For many writers this is bound up with the view that a spontaneous rise in the nominal wage bill would give rise to an increase in the demand for bank credit and be ‘accommodated’ by an increase in the money supply.<sup>10</sup> The Post Keynesians claim, in addition, that central banks cannot refuse to accommodate demand for borrowed reserves at the discount window as this would imply abandoning their responsibility for the liquidity of the system. All they can do is to change the terms of lending, i.e. the discount rate and this variable, together with other devices such as open market operations used to control other short term rates becomes the ultimate monetary policy instrument.<sup>11</sup>

In the face of mounting methodological criticisms Friedman defended his money income causality thesis with the response that their data bases, in particular their timing of lags and leads, with allowance for some ‘feed back’ effects in the opposite direction.<sup>12</sup> Just when the monetarist empiricism was coming apart at the seams, Anna Schwartz and Michael Bordo sought to discredit the Tooke thesis in an article on Walter Rostow, (Schwartz’s erstwhile co-author in a book leaning towards the Tooke thesis<sup>13</sup>) and Arthur Lewis, with the curious subtitle: “Was Thomas Tooke Right?”.<sup>14</sup> The article dealt with sets of UK and US data for the period 1870-1913 and it used a “world” aggregate of money stock and real output data combining the UK and US data.

The substance of the Bordo and Schwartz argument is that the results of Lewis’s regressions of major commodity prices ( $P_i$ ) on the monetary gold stock ( $G$ ), demand ( $D$ ), supply ( $S$ ) and a time trend ( $t$ ) advanced as evidence in favor of the influence of real forces on the price level can be interpreted as consistent with the quantity theory approach in a regression of the general price level or of individual money prices on the ratio of gold to real output.<sup>15</sup>

$$\text{Lewis's regression: } \log P_i = B_0 + B_1 \log G + B_2 \log D + B_3 \log S + B_4 T + e$$

$$\text{Bordo - Schwartz (1) : } \log P_i = B_0 + B_1 \log (G/Y) + B_2 T + e'$$

$$\text{Bordo - Schwartz (2) : } \log P_i = B_0 + B_1 \log (G) + B_2 \log(Y) + B_3 T + e''$$

Our intention in this paper is to examine Tooke’s thesis in his own period of study. Our findings are mostly in agreement with Tooke’s causality hypothesis running from commodity prices to monetary aggregates. However we also encounter evidence for the period which raises serious questions for both Tooke’s and the quantity theory approach. This may be interpreted in accordance with Marx’s criticism of both the quantity theory and Tooke’s price theory positions.

Similarly, Wicksell’s attempt to overturn Tooke’s theory by a refined quantity theory approach also seems questionable. Wicksell admits on the basis of wholesale prices in Hamburg and England and both central bank as well as market interest rates in Berlin and London between 1850-1895 that Tooke’s interest rate hypothesis is also, not unlike his price hypothesis, shows a correspondence between theory and reality which is that *a high rate of interest is associated with high commodity prices and a low rate of interest with low commodity prices*, rather than the other way around as predicted by the quantity theory.<sup>16</sup>

<sup>10</sup> B. Moore 1988: xiv.

<sup>11</sup> N. Kaldor 1986: 25.

B. Moore 1988 : 14-18

<sup>12</sup> M. Friedman 1970 :52-55; Friedman and Schwartz 1982: 626-627.

<sup>13</sup> A.Gayer, W. Rostow and A. Schwartz 1953.

<sup>14</sup> Bordo and Schwartz 1981.

<sup>15</sup> Bordo and Schwartz 1981:117.

<sup>16</sup> Wicksell 1958 : 78, Chart on p.87.

Wicksell defends the quantity theory by redefining the theoretical interest rate as an unobservable real interest rate (assumed to be equal to the rate of return on real capital) and positing the observable market rate or for that matter the central bank rate as high or low only in relation to the hypothetical real rate<sup>17</sup> and asserting that in a pure credit economy the price level is a function of the interest rate. If the rate of interest on money deviates in whatever direction from the normal rate of interest or real return on productive capital the price level would move in the *reverse* direction.<sup>18</sup> As Wicksell himself was aware his thesis crucially depended on the inverse movements of the two rates of interest whereas the only possible source of information about the hypothetical rate is on the basis of the assumption that the two rates move in the same direction. Nevertheless, he comes forward with an explanation of the successively rising and falling secular price trends from 1790s to 1890s on the strength of this proposition. This does not meet Tooke's argument on his own ground.

Marx agrees with Tooke's observation on the empirically observed relation between the interest rate and the price level but points out two crucial theoretical drawbacks. One is the false distinction between currency as only engaged in circulating revenue and capital (understood as engaged in the transactions between capitalists) and the other his Smithian income (value added) theory of price. For Marx, the real distinction is between currency and interest bearing capital, where currency is mobile in both the circuit of revenue and the circuit of capital. Capital as such can take and periodically must take both the commodity and the money forms whereas interest bearing capital is simultaneously autonomous as well as dependent on the accumulation of real productive capital. Interest rate on money is functionally related to this category of interest-bearing or moneyed capital and not all capital as in the case of Tooke. Not all forms of capital - The emphasis is on liquid capital or degrees of liquidity.

Money capital may become momentarily detached from the overall movement of industrial capital. The investment of such money capital leaves room, in a metonymic way, for the development of a certain amount of fictitious paper claims on revenue. This makes it possible for such derivatives/fictitious capital to accumulate quite independent of the rhythms of the accumulation of industrial capital. In fact, insofar as the rise in the rates of interest which coincide with the onset of crisis tends to augment the value of fictitious capital, and to the degree that stagnation in production will divert investment into speculative paper investments, the accumulation of interest bearing capital may well at times be the reverse of that of the accumulation of real productive investment.<sup>19</sup> Accumulation of fictitious capital is dependent on, on the one hand, the quantity of money released out of the circuits of capital and out of the circuits of revenue to a lesser extent, and on the other hand, on the continued production and realization of surplus value. If the monetary accumulation of such interest bearing capital proceeds beyond a certain point then the unity of social capital is asserted in the form of crisis.<sup>20</sup>

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<sup>17</sup> "The expressions high or low rate of interest are after all only relative conceptions : a rate of interest is never either low or high in itself, but only in relation to what one can or thinks one can earn with the money at one's disposal by using capital in production." ( Wicksell 1958: 82. )

<sup>18</sup> Wicksell 1958: 82-83.

<sup>19</sup> Marx 1981....

<sup>20</sup> Shortall 1994 : 427.

## 2. Currency and Banking School:

In the history of Economic thought the Banking & Currency controversy has been extensively discussed. The consensus of scholars of classical monetary thought has generally been in favor of the proponents of the Currency school.<sup>21</sup> The Bank Acts of 1844<sup>22</sup> and 1845 - which remained the foundation of the British credit system until the first world war - were passed in accordance with the ideas of the Currency school.

However, a closer examination of the relevant literature reveals that by 1870's the Bank of England has already absorbed and was operating more on the basis of the major ideas of the Banking school.

There was however an apparent paradox<sup>23</sup>. The shift in British monetary policy located in the controversy (In the context of statistical data from the resumption of Bank of England specie payment (Gold convertibility) in 1821 up to the passing of the Bank act of 1844-45, secondly from 1844 to the financial crises of 1866, points otherwise.

For this purpose we utilize Tooke's data up to 1856. and for the remaining years a variety of other data sources are utilized. The theoretical debates of the Banking and the Currency school can be highlighted and the validity of their positions may be tested.

### 2.1 Theories of Regulation of Bank Notes

The Currency school considered that a purely metallic circulation (Excepting only as regards the convenience and economy of paper), is the type of a perfect currency, and contended that the only sound principle of a *mixed currency* is that by which the bank notes in circulation should be made to conform to gold, into which they are convertible, not only in value, but in amount. i.e. bank notes to be perfect and the only substitutes for gold coins. A regulation of the issue of bank notes, in conformity with this doctrine, has come to be known as the *Currency principle*.

One of the principal discoveries of Ricardo was that the aggregate currency consisting of metal and of *convertible* notes may depreciate if its total quantity exceed the exchange-value of commodities in circulation and the metallic value of gold. According to Ricardo inconvertible paper-money can depreciate in two ways. It may fall below the value which it professes to represent, because too much has been issued, or it may fall because the metal it represents has fallen below its own value. When the Currency school speaks of depreciation it is no more simply bank-notes in relation to gold, but bank-notes and Gold taken together.

Tooke's position is the exact opposite of the Currency Principal. He states: "That the prices of commodities do not depend upon the quantity of money indicated by the amount of bank notes, nor upon the amount of the whole of circulating medium; but that on the contrary, the amount of the circulating medium is the consequence of prices...That it is the quantity of money, constituting the revenues of the different orders of the state, under the head of rents, profits,

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<sup>21</sup> Some seminal contributions in this literature are, Viner (1937); Morgan (1943), Fetter (1965), Arnon (1991) Lapavistas (1994). None of these works utilize Tooke's comprehensive data (see History of Prices vol. I-VI). Arnon's main data source (1790-1821) is Jevons & others price indices. Jevon's own data on the bank account of England covering 1845 -1881 could have been most valuable in evaluating the period Post 1844 Peel's Act. Unfortunately he has averaged weekly numbers across years in search of cyclical fluctuations and presents only the averages and their deviations, making it impossible to reconstruct the original series for each year. Lapavistas introduces Marx amid the Bullion and Currency controversies and traces the influence of Banking School on the monetary thought of Marx. Lapavistas work remains at a theoretical level.

<sup>22</sup> The 1844 act not only turned the Currency principle into Law, it also divided the banking system in two departments, one managing deposits, the other managing circulation which amounted to segregating the assets held against notes (Gold reserves vs. circulation) from assets held against deposits (securities vs. deposits) in the hope of reducing the risk of default. On the contrary Tooke argued it will have the exact opposite effect since by separation of deposits from Bullion and consideration of bullion as the only form of reserves the actual reserves (Bullion + deposits) of the bank has shrunk.

<sup>23</sup> P. Barrett Whale (1953) 'A Retrospect View of the Bank Charter Act, 1844', in T.S. Ashton and R.S. Sayers eds. *Papers in English Monetary History*. Oxford. pp. 126-131.

salaries and wages, destined for current expenditure, that alone forms the limiting principle of the aggregate of money prices, the only prices that can properly come under the designation of general prices.”<sup>24</sup>

A careful reading of the above passage highlights how the category *Quantity of money* can be a point of confusion. Tooke’s first sentence confines the quantity of money to bank notes which is different than the whole of circulating medium, which may include bills of exchange, coins, cheques, etc.<sup>25</sup>. In the second paragraph the quantity of money is limited to effective demand (Revenue).

For 1841-47 period (figure 1), the ratio of bank notes to total circulation which includes metallic coins has been on the rise. Clearly the issue was not simply one of definition but of the modus of operandi of the different forms of money.

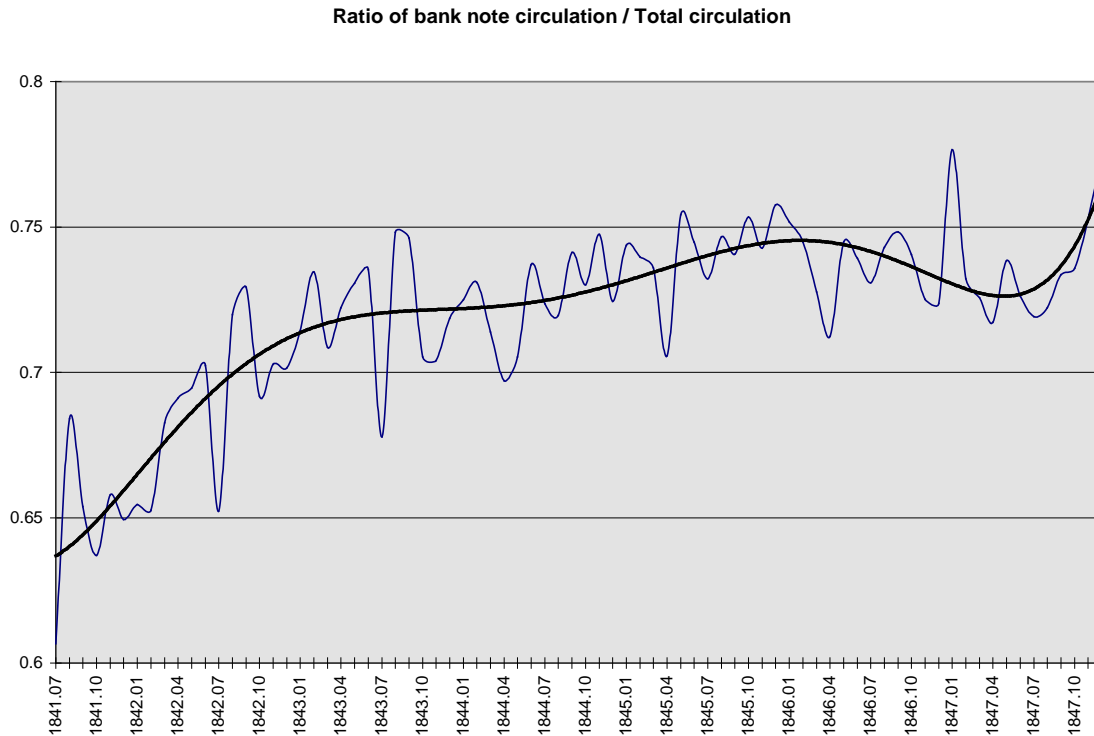


Figure 1.

Tooke’s position was that bank notes is a *different form* of money<sup>26</sup>. Since different forms play different functions they were subject to different laws.

“ It will hence appear that the difference between paper-money so issued and bank notes such as those of this country consists, not only in the limit prescribed by their convertibility to the amount of them, but in the *mode of issue*. The latter is issued to those only who, being entitled to demand gold, desire to have notes in preference...the quantity, therefore is

<sup>24</sup> Tooke, An Inquiry..p.123.

<sup>25</sup> In the 19th century The category “Circulating medium” or “Circulation” included Gold, silver, copper coins and bank notes. It did not include bank deposits or bills of exchange. It was also called mixed currency, since circulation consisted of metallic coins plus bank notes. Ricardo’s major discovery was that the gold coins in circulation can devalue against bullion, if bank notes depreciate. Tooke’s position was that circulation of money is merely a secondary phenomena. (See K. Marx, A Contribution to the Critique of Political Economy, New York 1970, p. 186.)

<sup>26</sup> Harrod (1969:39) holds the view that The Currency school considered money as coins plus notes, and the Banking School notes as promises to pay and not money. According to Tooke Bank-notes are circulating credits, as such they belong to the category not of paper money, but of commercial paper. Bank-notes were promises to pay in gold but became legal tenders only as late as 1833.

an effect, and not a cause of demand. A compulsory government paper on the other hand, while it is in the course of augmentation, acts directly as an originating cause on prices and incomes, constituting a fresh source of demand in money, depreciated in value as compared with gold, but of the same nominal value as before.”<sup>27</sup>

In other words under conditions of convertibility as was the case in Britain after 1821 onwards, the quantity of money as a means of payment is endogenously determined by the level of economic activity. Government legal tender is issued unilaterally i.e. as payment of revenue or income to the recipient, where as convertible bank notes were issued either against an equal amount of gold deposited or more frequently as loans, advances or as discounts against bills of exchange (Commercial bills). Tooke finds a crucial difference in these two different modes of issues. The inconvertible paper (government notes) creates demand where as the latter (bank notes) is created on demand by borrowers. Therefore convertible interest bearing bank notes returns to their issuer as soon as the need for circulation is over. This was Fullarton’s “Law of Reflux”.<sup>28</sup>

Currency school’s position was the opposite where over issue of convertible bank notes affect prices; hence the need to regulate the amount of bank notes in accordance with the movement of gold. Consequently the Currency School argued that note issues should be centralized in the hands of Bank of England. Bank of England itself had to be reorganized by way of being divided into two departments one of them concentrating exclusively on note issue, the other department on managing deposits and discounts<sup>29</sup>.

Yet the Currency School saw no difference between commercial credit (bills of exchange), paper-money and bank notes<sup>30</sup>. That credit can increase the speed of circulation seems not to concern Ricardo. Interest rate as a major source of income for the financial sector is strikingly absent. That there is a difference between trade and consumer credit, which Tooke distinguished under the heading ‘Distinction of circulation as between dealer and dealer, and between dealer and consumer’, also makes no difference.<sup>31</sup> Since all forms of bills of exchange by the Currency School is consolidated with Bank-notes as currency, distinctions of whether the bill is drafted for foreign trade or domestic production or wholesale or retail does not even arise. In short Ricardo disregarded all functions performed by money except its function as a medium of circulation. The *heterogeneous composition of monetary forms* seem to have no significance for the Currency school.

In contrast for Tooke the determination of the quantity of bank notes in circulation become propositions about the composition, rather than the size, of what may be called the money supply “...clearly at a given level of the economic activity the public will find it convenient to hold and use a certain quantity of Bank notes. Should these notes not already be in circulation the public may obtain them by converting their deposits or coin into notes. Should too many notes be in circulation they may be exchanged for deposits, used to pay off debts to the banking system, or should they

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<sup>27</sup> Tooke, *Inquiry into the Currency Principle*: p.70, emphasis added.

<sup>28</sup> For a detailed discussion of Reflux movement of money see “Episode. \* Reflux \* Movements of Money in Capitalists Reproduction” in *Collected works Vol. 33. Karl Marx & Fredrick Engels 1991, New York International publishers.* pp. 171-238.

<sup>29</sup> The basic idea of the Bank Act of 1844 comes out of Ricardo’s tract, the “Plan for the Establishment of a National Bank” (1824), but in fact the reformers based their case on certain outstanding evils in banking practice which demanded a remedy. From the evidence of the Committee of 1840 it is clear that the stated principles of 1833 (Palmer rules) were honored largely in the breach. It did not maintain a constant level of securities, nor a reserve of bullion equal to one third of its liabilities, nor did it reduce its note issues when the actions of the public produced a drain on its gold supply. See Goodbar 1935:212.

<sup>30</sup> “Adam Smith speaks of the advantages derived by merchants from the superiority of the Scotch mode of affording accommodation to trade, over the English mode, by means of cash accounts. These cash accounts are credits given by the Scotch banker to his customers, in addition to the bills which he discounts for them, 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 will be circulated; and it can be of no real importance either to the banker or merchant, whether the whole be issued in discounting, and the remainder be issued by means of these cash accounts.” D. Ricardo, *On the Principles of Political Economy & Taxation*: p.366., emphasis added.

<sup>31</sup> See Tooke, *Inquiry*..chapter 7.

begin to depreciate they could be exchanged for gold coin, one of the items relative to which their depreciation would have to take place.<sup>32</sup>

### 3. The British Monetary situation 1797-1822: Gold, Paper-money, Commodity prices Triangle.

How does the historical data shed light on the theoretical debates ? From 1782-1800 while the price of gold remained fairly constant, from 1810 to 1820 it showed wide fluctuations. Index9 (figure 2) is Jevon's composite price index of nine selected commodities with 1782=100 as the base. The other two plots are index of price of wheat and money. Money is defined as sum of bank notes and deposits (indexed 1782=100). During this period high prices of commodities and gold drain occur simultaneously.

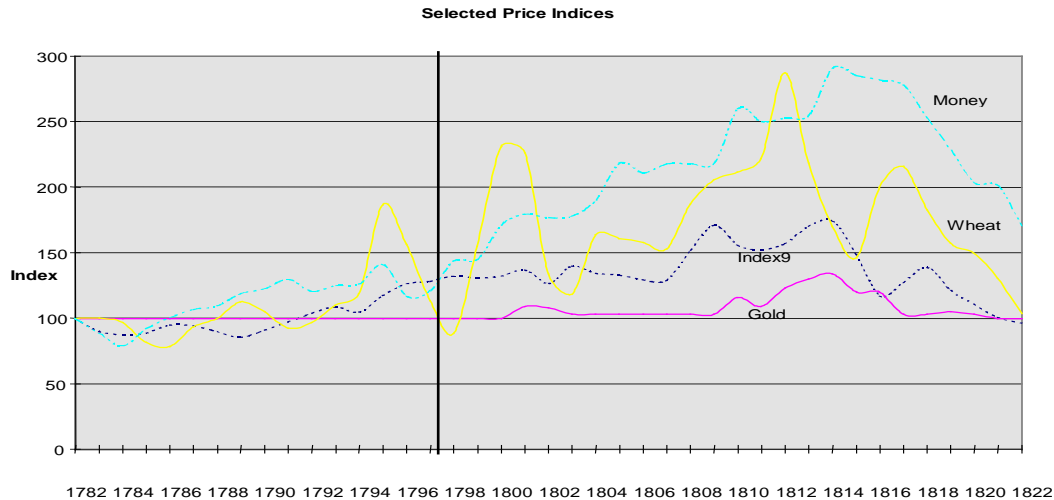


Figure 2.

Source: Jevon's price index, based on Tooke (1848), *History of Prices* Vol. I & II, p:397-420.

Arie Arnon (1991), *Thomas Tooke, Pioneer of Monetary Theory*, p. 159, Table 10.3

Note: Bank of England notes were convertible for 1782- 1797 and inconvertible for 1797-1821 period.

Three main issues of the controversy may be highlighted by the above graph. The first two points pertain to the *triangular* relation between Gold, Paper-money, and commodity prices. The third issue was the implication of credit and its impact on prices.

First, fluctuations in money circulation seemed independent of gold and far exceeded it. For certain periods (1782-1800, 1802-1809, 1818-1822) the quantity of money index falls or rises but there is no change in gold prices. Yet in other periods (1801-1802, 1809-1818) the rise in money index is accompanied by a rise in gold prices. Under the latter period was this the case of an over issue of bank notes, depreciating the notes in value and raising the relative price of gold as the Currency school contended ?

Secondly, the relation of bank note circulation and commodity prices<sup>33</sup>. The question was to what extent the rise in money circulation was due to the rise in money prices and to what extent it was due to actual accumulation of capital ? Commodity prices were rising but by less than the amount of rise in circulation of bank notes. Did circulation exceed the "Correct/Ideal" proportion of circulation (paper-money gold proportions) or did Bank-notes exceed the requirements of commodity circulation?

<sup>32</sup> D. Laidler 1972, 'Thomas Tooke on Monetary Reform', in M. Peston and B. Corry eds. *Essays in Honour of Lord Robins*, London. Weivenfeld and Nickolson. p. 174.

<sup>33</sup> K. Marx *Capital* vol. III chapter 30.



More over was this deviation being matched by an equal amount of commercial Bills (Bills of exchange), hence a new category that is not accounted in the above graph ? If so was this credit pushing bank-notes out of circulation by making a portion of it redundant or was there also undue expansion of credit rather than simply bank notes ? This issue pertained to the Law of Reflux<sup>34</sup>.

According to the Banking school: " It is not so much by convertibility into gold, as by the regularity of the reflux, that in the ordinary course of things any redundancy of Bank-note issue is rendered impossible".<sup>35</sup>

In contrast Ricardo's value theory stated that the labor-time embodied in commodity-gold and gold as a medium of exchange would reflect the labor times embodied in other commodities and hence the market price. If the price of gold as an index has remained constant through 1784-1809 then the rise of commodity prices reflected that commodities were becoming dearer relative to paper-money or gold, since gold and paper-money have maintained their "Ideal" par-value . If the price of gold was on the rise then there must have been too much currency (bank-notes or bills of exchange) in circulation. The law of reflux therefore could not hold. Undue expansion of credit is inflationary, be it bank notes or bills of exchange.

A striking aspect of the impact of credit by both schools is absence of any theory on accumulated past debts on the producer or consumer side which may be traced up to contemporary Keynesian theories of multiplier-deficit financing at constant prices. An autonomous shift in investment fails to account for the debt-multiplier effects.<sup>36</sup>

On what we have called the *triangular* relation, Marx speaks of a value theory present in Ricardo and absent in Tooke. He states " According to Ricardo's general theory of exchange-value, the rise of gold above its exchange-value, in other words above the value which is determined by the labor-time it contains would lead to an enlarged output of gold until the increase supply reduced it again to its proper value. Conversely a fall of gold below its value would lead to a decline in the output of gold until its value rose to its proper level. These opposite movements would resolve the contradiction between the metallic value of gold and its value as a medium of circulation; the amount of gold in circulation would reach its proper level and commodity-prices would once more be in accordance with the standard of value.

These fluctuations in the value of gold would in equal measure affect gold bullion since according to the assumption all gold that is not used as luxury articles is in circulation. Seeing that even gold in the form of coin or bullion can become a value-token representing a larger or smaller value than its own, it is obvious that any convertible bank-notes that are in

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<sup>34</sup> According to Glasner (1992, p:867-893) The Real Bills Doctrine which may be traced at least back to John Law, is usually understood to assert that if banks lend only on the security of real bills representing actual goods in process, they cannot issue too much money. If the doctrine is applied to the entire banking system rather than a bank, it is a prescription for monetary policy and controlling the price level. Glasner distinguishes between the real bills doctrine and the law of reflux high lighting that the validity of the former does not depend on the latter. Only under convertibility and if applied to a single bank the doctrine presumes the operation of law of reflux. Glasner's work remains at a theoretical level. It is beyond the scope of this work to test Glasner's position concretely., though the impact of bills of exchange on commodity prices is tested.

<sup>35</sup> Tooke, History..., Vol. IV, PP: 180.

<sup>36</sup> In the Keynesian approach the marginal propensity of less than one leads to the simple multiplier effect. But it is possible to investigate the implications of lags in the circulation of money throughout all sectors rather than in households alone where the lag usually incorporated leads to the multiplier analysis. Goodwin's theoretical investigation of this issue led him to the conclusion that there is no simple income-expenditure lag as ordinary assumed, but there is a distributed lag that spins out the consequences of any disturbance much longer than any inspection of industry or consumer lags by themselves would lead us to expect.

For firms the excess of expenditure over revenues is for the most part financed through borrowing. In this way the Keynesian multiplier for households consumption can be extended to multiplier effects across firms. What Goodwin in addition discovers is that even in a system of equilibrium, if injections move in opposite directions (meaning an injection in one firm/sector due to borrowing from another firm/sector), oscillations may arise and he states "incidentally this is the kind of case which aggregate analysis cannot distinguish, for the total amount of injections is never changed ". R. Goodwin 1950, *Economic Journal*, "Does the Matrix Multiplier Oscillate", pp.23.

For a simulation of this issue see D. Foley 1985 "Liquidity-profit rate cycles in a capitalist economy" Mimeo Department of Economics, Barnard College, New York, 10027.

Our unpublished preliminary work, expanding on Foley's non-linear dynamic model, allowing for interest rate to be endogenously determined, under different parameter values, results in explosions, damp and limit cycles.

circulation must share the same faith. Although bank-notes are convertible and their real value accordingly corresponds to their nominal value," then the aggregate currency consisting of metal and of convertible notes" may appreciate or depreciate if, for reasons described earlier the total quantity either rise above or falls below the level which is determined by the exchange-value of commodities in circulation and the metallic value of gold. According to this point of view, inconvertible paper money has only one advantage over convertible paper money, i.e. it can be depreciated in two ways. It may fall below the value of the metal which it professes to represent because too much of it has been issued, or it may fall because the metal it represents has fallen below its own value. *This depreciation, not of notes in relation to gold, but of notes and gold taken together*, i.e. of the aggregate means of circulation of a country, is one of Ricardo's main discoveries which Lord Overstone & Co. pressed into their service and turned into a fundamental principle of Sir Robert Peel's bank legislation of 1844 and 1855."<sup>37</sup>

Embedded in the *triangle* relation there is a circular dilemmas. Were prices rising because there was a shortage of commodities or was it that bank-notes exceeded their par-value in relation to gold depreciating in value and thus bringing the rise of commodity or gold prices simultaneously or was the labor-times embodied in gold production in decline ?

Tooke quoting Loyd states: "Money, it must be remembered is not only useful as a medium of exchange, in lieu of barter and credit but also as a measure of value; and when paper in itself possessing no intrinsic value, is used as a substitute and representative of precious metals, the convertibility of that paper becomes essential for preserving its character as a standard of value".<sup>38</sup>

But Tooke went further and maintained that the "correct" ratio of paper-money to gold in and of itself does not control the variation in the inflow/outflow of gold. On the one hand supply of gold cannot catch up with the ever expansion of industry. On the other hand paper-money as a means of realizing commodity prices is depreciating in value since the ratio of paper-money/gold is rising (figure 2). Maintenance of the par-value of bank notes for the sake of preserving the standard of value then was antithetical to paper-money as a medium of exchange the quantity of which should match the value of transactions (assuming a constant or a limit to the velocity of paper-money).

It may be argued that restrictions on paper-money or the limit of its velocity to cover the value of transactions could have been alleviated by means of credit while paper-money maintained its par-value with gold. On this issue Tooke points:

" Variations in the state of credit may and often do arise from circumstances *extrinsic* to the state of the circulation, and that no regulation of the issues of paper-money can operate as an infallible preservative against occasional great fluctuations in the state of credit and in the rate of interest "<sup>39</sup>

It is clear that the issue was the state of credit yet no one has spoken of the *par-value* of credit. The Banking school could not because it lacked a comprehensive value theory and the Currency school did not since it was exclusively focusing on bank notes rather than Bills of exchange or interest rate movements.

#### **4. Bills of exchange and price:**

Tooke breaks bills of exchange into three categories: Small, medium and large bills of exchange<sup>40</sup>. Small bills pertains to drafts between retailers and consumers, medium bills are drafts of manufactures and wholesale on retail trade and vice versa. Large bills are drafts on export or import. He finds that the major variations in bills of exchange belong to medium and large bills (figure 3). That almost no variation occurs on small bills. Total fluctuation of bills of exchange is primarily due to large bills.

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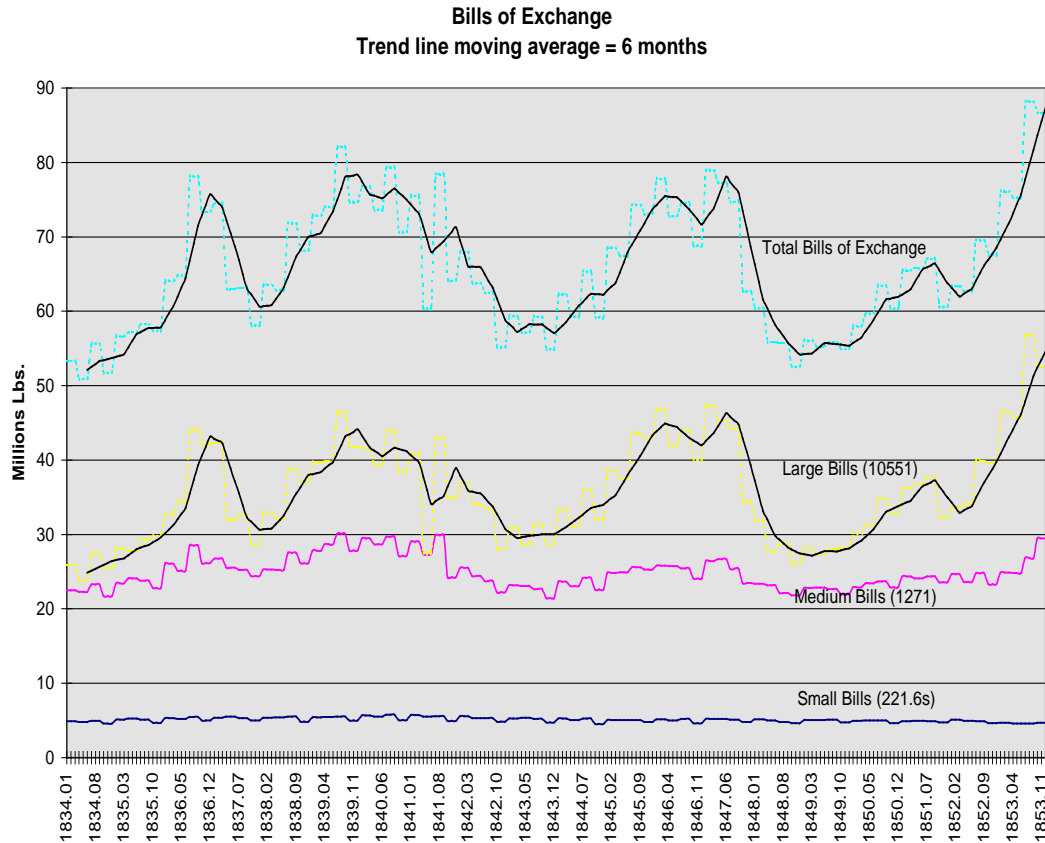
<sup>37</sup> Karl Marx 1970, *A contribution to the Critique of Political Economy* edition, New York, International publishers. p. 173-74. Emphasis added.

<sup>38</sup> Thomas Tooke, *History...* Vol. III page 248.

<sup>39</sup> Thomas Tooke, *History...* Vol. III page 245. Emphasis added.

<sup>40</sup> Thomas Tooke, *A history of Prices* Vol. 6. 589-592

Significant for his argument is that consumer credit can hardly be part of large bills of exchange. Since the vast majority of wages is in terms of coins. According to Tooke variation in small bills is nil and remained fairly constant and could not have been the cause of the rise in prices.



**Figure 3.**

Source: T. Tooke and W. Newmarch, 1858. *A History of Prices and of the state of circulation from 1792-1856*, vol. 6. New York, Adelphi Co. reprint 1928, p.589-92.

Moreover from 1839-1844 the trend line of moving average of 6 months shows a decline in large bills of exchange. If as the Currency School contends that bills of exchange are part of the currency and are over-issued and inflationary a declining trend of large bills was suggesting otherwise. Note as we move from large to small bills the turnover time of these bills increase .<sup>41</sup>

<sup>41</sup> A modern version of these issues appears in the Radcliffe committee's report of 1959. The committee's main concern was to review the existing British Banking system and recommend how the system could be improved. Their position on the velocity of circulation may be summed up as the following: "It is possible for example to demonstrate statistically that during the last few years the volume of spending has greatly increased while the supply of money has hardly changed; the velocity of circulation of money has increased. We have not made more use of this concept because we cannot find any reason for supposing, or any experience in monetary history indicating, that there is any limit to the velocity of circulation; it is a statistical concept that tell us nothing directly of the motivation that influences the level of demand" Kaldor then makes the following remark on Radcliffe's report: "I wonder whether the members of the committee were fully aware that..they fully repudiated in one full swoop the quantity theory of money in all its versions, from Cantillon and Hume, through Ricardo, Marshall, and Walras, Irving Fisher and Milton Friedman..., right down to Mrs. Thacher" (Kaldor, *Scourge of Monetarism*, p:9)

If we consider fluctuations of medium or large bills of exchange as a proxy for capital's expansion and contraction (including exports and imports), particularly if Tooke's Law of Reflux is to be held, then the fall in the volume of these bills reflects a contraction of commodity circulation. Even a constant rate of bank-notes at times of contraction can be seen as an over-issue of bank-notes. Was this the case? How does such variations relate to bank notes?

#### 4.1 Bills of exchange and bank-notes:

According to Tooke the vast majority of transactions were by means of Bills of exchange and not bank-notes.

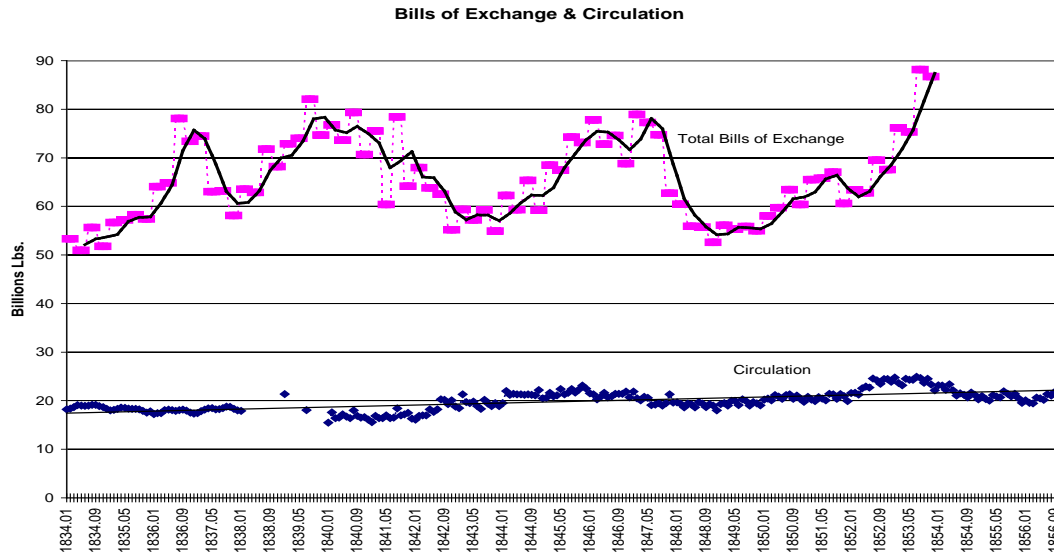


Figure 4.

Tooke's data seems to exonerate the banker's of creating inflation by means of bank-notes. From 1840 to 1844 bills of exchange fell while bank-note circulation rose. from 1844-1847 bills of exchange rose while bank-notes declined, though for 1834-1856 period the over all trend of the fitted line of bank-note circulation was a gradual rise / constant.

Both Tooke and Fullarton were vehemently opposed to the assumption that bank -notes exercise some constant or permanent influence over the magnitude of bills of exchange. "...there exists no such invariable connection, as has been generally assumed, between the contractions and expansions of the bank-note circulation, and the expansions and contractions of the bill circulation"<sup>42</sup> The correlation between bank-note circulation and large bills of exchange was .08. The regression between the two variables: bank-note and bills of exchange, at 95% confidence level ,leads to coefficients that are not significantly different from zero.

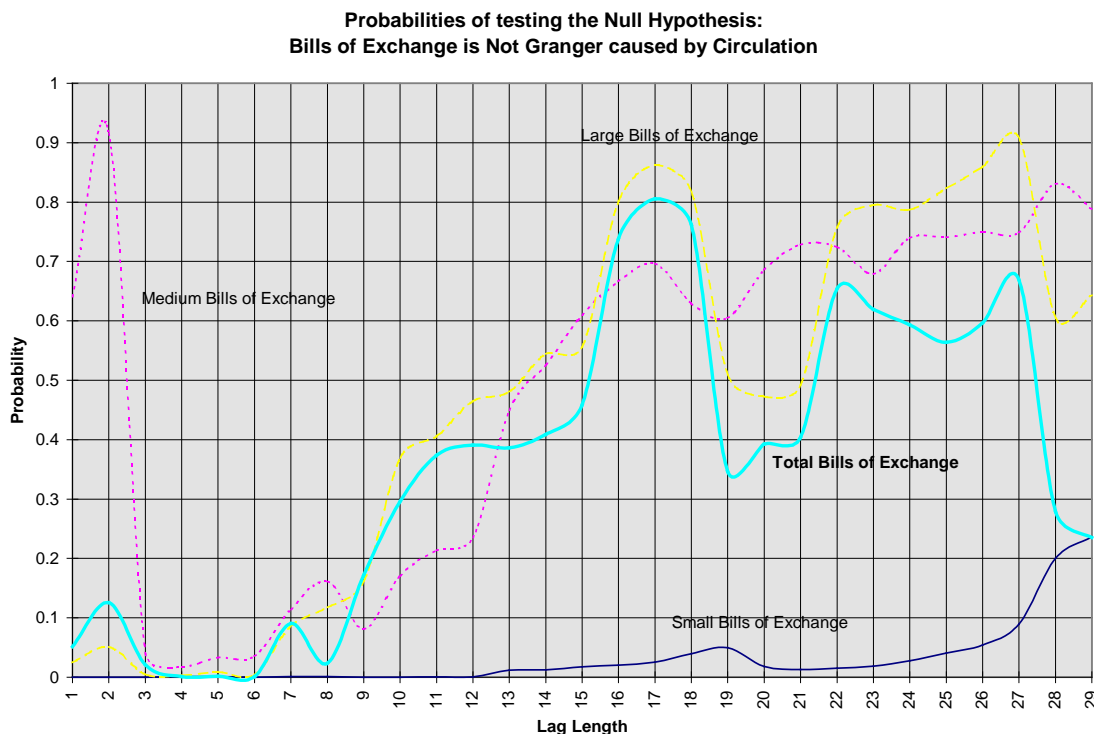
Tooke's rationale was that the vast majority of exchange of commodities are not done by means of bank-notes but by the medium of book debts, credit, cheques on bankers. It is the balances only of these transactions that require the intervention of bank-notes. Under this proposition the lack of any relation between bank-notes and the bills of exchange should not come as a surprise. Tooke argues *a fortiori* . "The truth really is as affirmed by Mr. Fullarton that there is no invariable connection between the variation of the Bank Note, and the Bill Circulation: - unless indeed it be a connection the precise reverse of that assumed by the Currency Party"<sup>43</sup> "...all the evidence available to us points distinctly and uniformly to the conclusion that the fluctuations of the bank note circulation were determined and regulated

<sup>42</sup> J. Fullarton 1845. *On the Regulation of Currencies*, etc. 2nd edition, p.47. London John Murray. reprint 1969. New York, Augustus M. Kelley.

<sup>43</sup> T. Tooke A History of prices vol. 5. p.506

by the consequences flowing from previous applications of capital and credit in particular modes “<sup>44</sup> This last proposition on *regulation* requires further investigation.

**4.2 Bank-note circulation and bills of exchange:  
Granger causality.**



**Figure 5.**

In the above graph the probabilities are for correctly rejecting the null hypothesis. A low probability implies that variable Y is not caused by X. In this case for up to 10 lags the probability that total bills of exchange is *not* Granger caused by bank-notes is under 40%. Only for lags 15 through 18 these probabilities rise over 50%. The result therefore is not robust for all lags. In general therefore Tooke was correct; *bank-note circulation was independent of bills of exchange.*

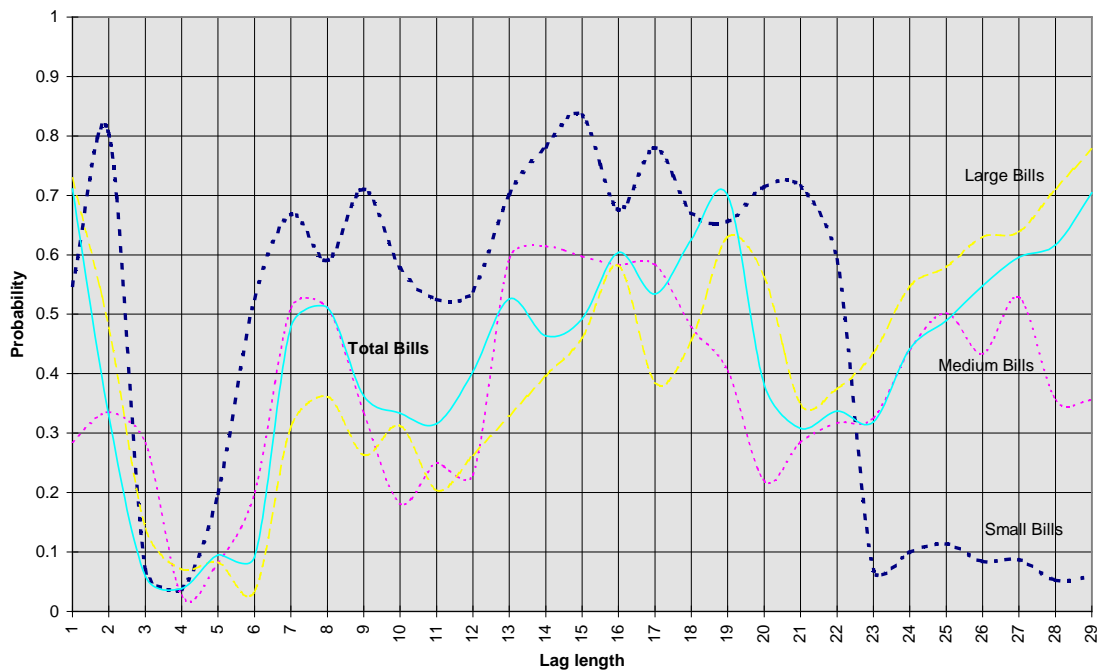
But once we consider specific bills, in particular medium bills then the result is not so overwhelming in support of the Banking School. For the first 2 lags medium bills of exchange show probabilities at 64% and 91%. These probabilities are high enough reflecting that variation in medium bills is Granger caused by bank notes.

The primary support for the Currency schools position lies in large Bills. It is not until we consider lag lengths of 15 through 27 that we are in the range of probabilities of 40% to 90% for rejecting the null hypothesis.

If there is any causality between bills of exchange and bank notes the direction is the reverse of what the Currency School professed. Expansion of bills of exchange may reflect higher production and thus a general rise in circulation. Tooke considered bank note circulation demand driven, an effect rather than the cause of economic activity. The following graph is the test of whether Circulation is not Granger caused by different types of Bills of Exchange.

<sup>44</sup> T. Tooke A History of prices vol. V. pp. 344.

**Null Hypothesis: Circulation is not Granger Caused by Bills of Exchange**



**Figure 6.**

High probabilities do not give support to Tooke’s *regulating* position. For total bills of exchange for lag lengths 13 through 20 the probabilities vary between 50% to 70%. These are probabilities for correctly rejecting the null hypothesis: *Bank-note circulation is not granger caused by bills of exchange.*

Relatively small bills of exchange which capture small retailers and consumers show high probabilities. Circulation is Granger caused by small bills of exchange. Fluctuations of the bank note circulation were determined and regulated by the consequences flowing from previous applications of capital and credit in particular modes (small bills). As the lag length increases the dominance of which type of bill may affect circulation switches. In short as Tooke suggested the degree of association between these two variables must be almost nil.

Bills of exchange fluctuations itself must have been due to variation in actual commodity circulation. “ the elasticity of the money-circulation must therefore be sufficient to adapt itself to this [Commodity] alteration of expansion and contraction”<sup>45</sup>. Further elaboration on this point is considered under Hoffman’s industrial production index section.

**4.3 Bank Competition:**

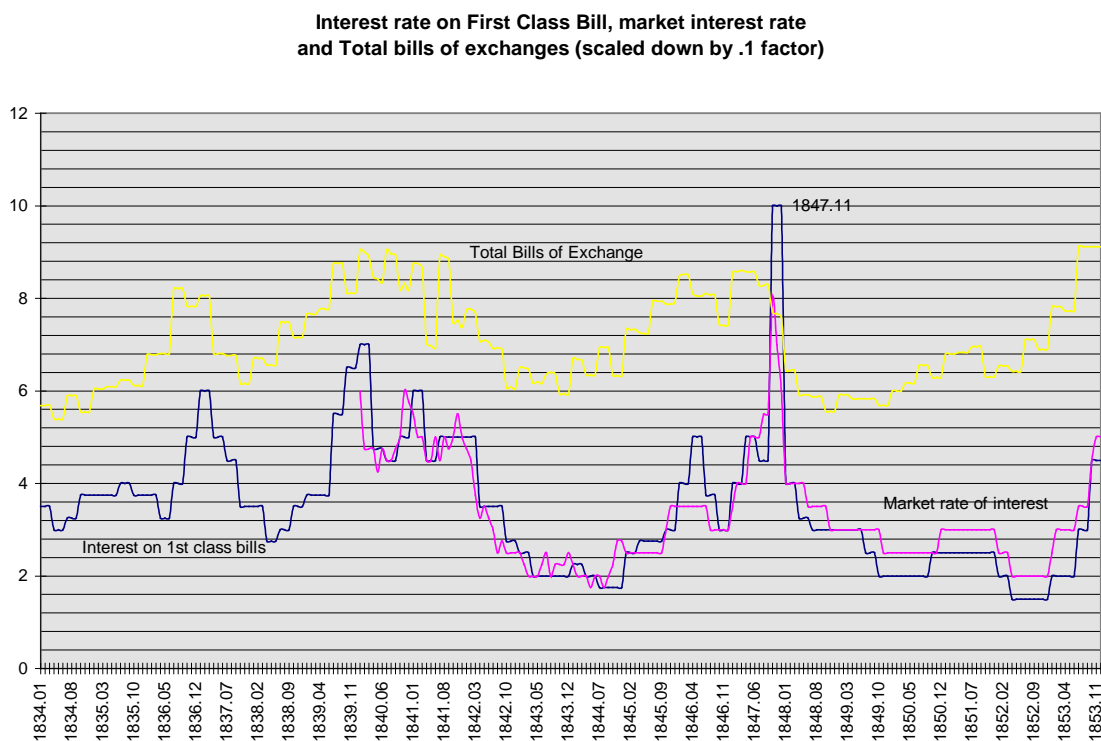
**Bills of Exchange Interest rate, and Bank types.**

Though the Peels’ a Act was in support of bank competition in terms of lowering interest rates the Currency school demanded restriction on banks to issue notes of their own in competition with each other. After 1844 Bank of England began to compete aggressively with other financial institutions and in September of 1844 the discount rate was lowered to 2.5% . This policy coincided with the railway speculations. Through out 1845-46 Bank of England’s discount rate was actually below the market rate and was kept there for 3 years. In 1847 funds began to be drawn away abroad, calls for the payment of rail way shares became heavy, a bad harvest and the potato famine in Ireland also necessitated large scale of imports.

<sup>45</sup> K. Marx , *Capital Vol. II*, p.343.

By April 1847 interest rate was raised to 5%. At the crises of october of 1847 interest rate was raised to 9% and by the end of the year interest rate fell to 5%.

The Bank learnt a bitter lesson, never again except in times of emergency did it revert to competing in the discount market with other institutions. It abandoned the ideas that it was as free to act as any other bank and for discounting it began to charge a minimum rate well above the market rate. Consequently its Bills of exchange portfolio fell from a peak of 12,000,000 pounds in October of 1847 to 3,000,000 pounds.<sup>46</sup>



**Figure 7.**

Figure 7 captures the relation of bills of exchange and interest rate. In 1850's the average amount of Bills of exchange was 6,000,000. The regression of total bills and interest as the explanatory variable after first differencing is presented in table 1. The general parallel cyclical movements of bills of exchange and the positive coefficient (+.634) on interest rate suggests that with trade circulation on the rise credit has been tight and at times of trade contraction credit is lax.

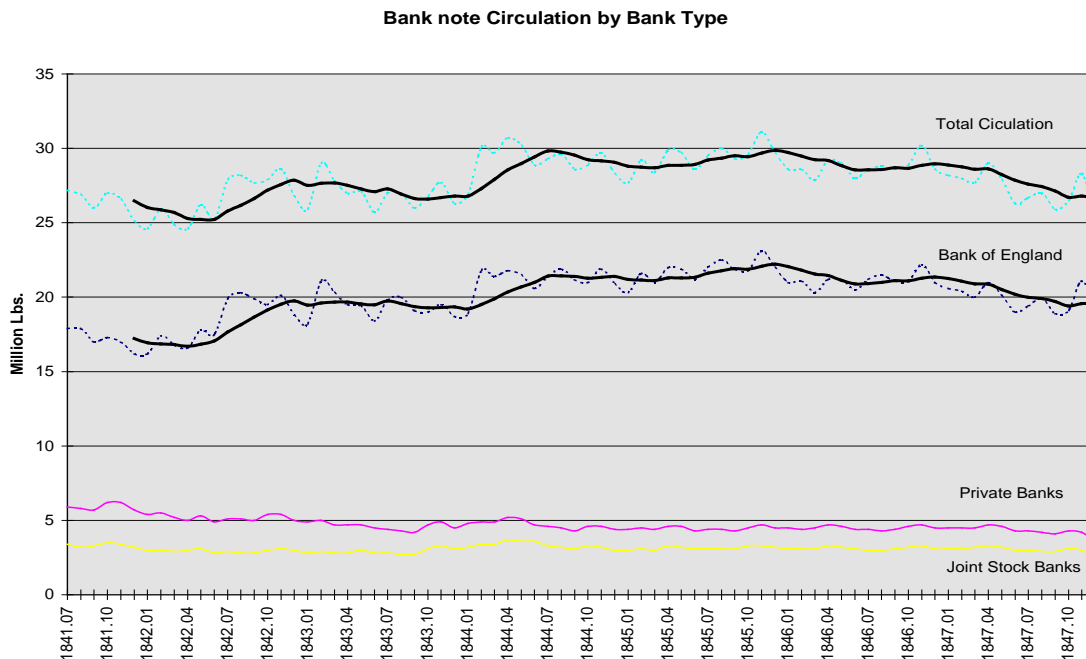
**Table 1.  
Bills of Exchange and Interest rate**

$\text{Total Bills of exchange} = .137 + .634 \text{ Interest rate}$ <p style="text-align: center;">(.58)      (1.76)</p> <p style="text-align: center;">DW Statistics = 2.0, for 1834-1853 period. (Monthly data).</p>
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The Banking school argued that competition across banks could not have led to over issue of Bank notes. To make this point further clear Tooke broke down the total Bank notes in circulation by bank type (Figure 8). Here the

<sup>46</sup> F. Sheppard 1971. *London 1808-1870 ; the Infernal Wen*. Berkeley. pp.65-67

division was between Bank of England, Private Banks and Joint stocks<sup>47</sup>. Based on 1840-1847 data he argued: First only a small fraction of bank notes in circulation was issued by private banks. Secondly that the issuance of these notes were not at the cost of other banks. Private notes remained fairly stable through out the period. Thirdly it was Bank of England that shows the biggest fluctuation in its issuance and not private or joint stock banks.



Source: Tooke (1884), *History of Prices* Vol. VI, p. 167, 560-1,583.

**Figure 8.**

But this as noted was not and could not be sufficient reasoning. Bank of England as the last resort was under a number of other constraints which the private banks were not. The following passage captures this constraint:

“ In the case of private banks which issue their own notes we have this difference, that if their notes remain neither in local circulation, nor return to them in the form of deposits, or in payment for due bills of exchange, they fall into the hands of persons who compel the private bank to cash these notes in gold or in notes of the Bank of England. In this event, therefore, its loan in fact represents an advance of the notes of the Bank of England.”<sup>48</sup>

#### 4.4 Bullion movements 1782-1822: Granger causality.

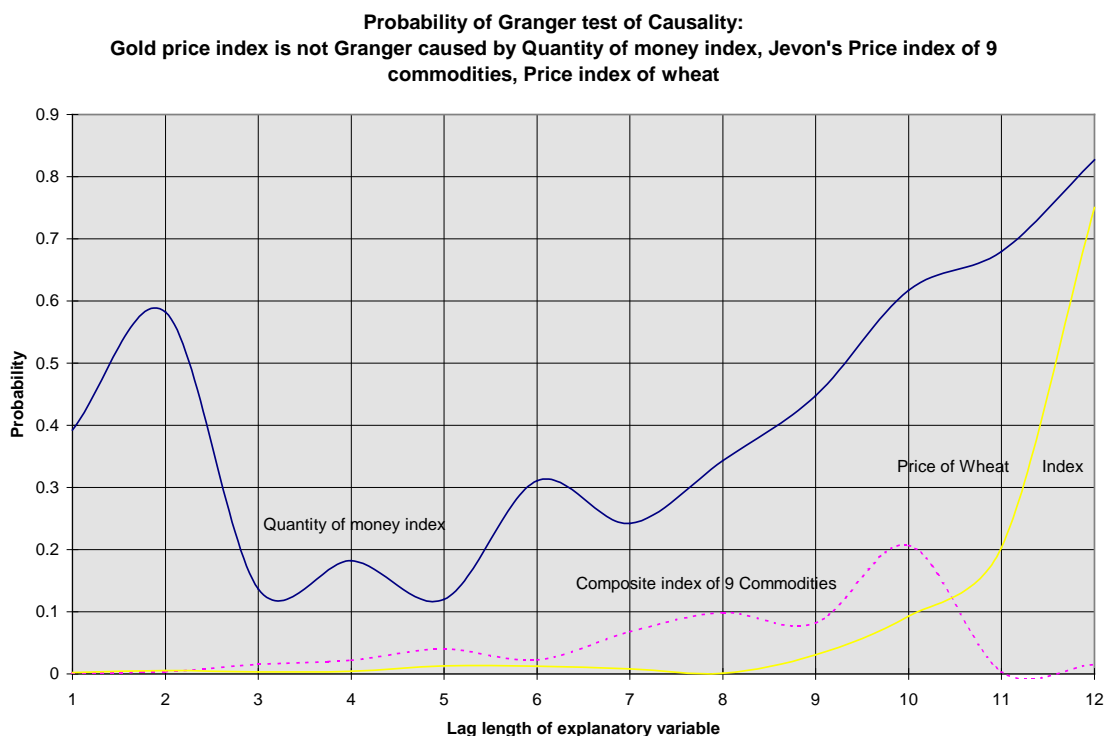
<sup>47</sup>Joint Stock Banks were formed by consolidating their reserves. By law these banks were under restriction for limited issuance of bank-notes. Clearly then Joint Stock Banks short of breaking the law could not have over-issued bank notes, unless the limit set by law itself was not appropriate.

<sup>48</sup> K. Marx, *Capital* Vol. III, p.456.



In capturing the cause of gold drain, two periods of data is considered. The first is 1782-1822 period for which both Jevon's composite index of 9 commodities and the price of gold is available. The second period of analysis is based on Tooke's data covering 1834-1856 period. For this period a number of other variables, such as bills of exchange, securities, etc. are available which the 1782-1822 period lacks. Regression equations for these periods can give a degree of association of monetary variables in relation to gold reserves or the price movement of gold. For 1782-1822 the pair wise Granger causality was run between the Gold price index and three other indexes: 1) The Quantity of money index, 2) the price of wheat index, 3) Jevon's Composite price index of 9 commodities. Thirty six tests were run, the results of which is consolidated in the following graph.

The null Hypothesis under investigation is whether the price of gold is not granger caused by any of the other 3 explanatory variables. A high probability implies the rejection of the null hypothesis.



**Figure 9.**

It is interesting that for this period of analysis the test is conditionally in support of the Currency School's assertion. It is the over issue of bank notes and not commodities that has granger caused the rise in price of gold. For the first 2 lags the null hypothesis that gold price is not Granger caused by quantity of money index is rejected at 40% and 60% probability. On the other hand Jevon's composite price index and wheat price index up to 9 lags show a probability of less than 10%. In short *Money index explains the variation in gold price better than commodity price index.*

#### **4.5 Banks Portfolio adjustments: Monetary authorities and the public 1834-1856**

The two schools were also at odds with the role of deposits. The Currency school considered deposits as "non-currency". But Tooke's position was that deposits is not "Active" money. The activity, if any, is in the payment by cheques founded upon deposits"<sup>49</sup> Both Samuel Jones Loyd and George Warde Norman in their evidence before the Bank Charter Committee of 1840 made clear statements that they do not consider Bank of England deposits as currency.<sup>50</sup>

<sup>49</sup> Tooke, Inquiry..p.23, 62.

<sup>50</sup> G.W. Norman a director of the Bank of England and second most famous man of the currency school

The distinction is one of cheques (flow) and deposits (stocks). If securities were being bought by means of private and public deposits this implied further contraction in banks assets in the form of deposits but it also implied that the amount of bank notes in circulation in relation to its shrinking gold reserves was rising even further. Paper-money originating from deposits traded for securities was outside Bank's control.

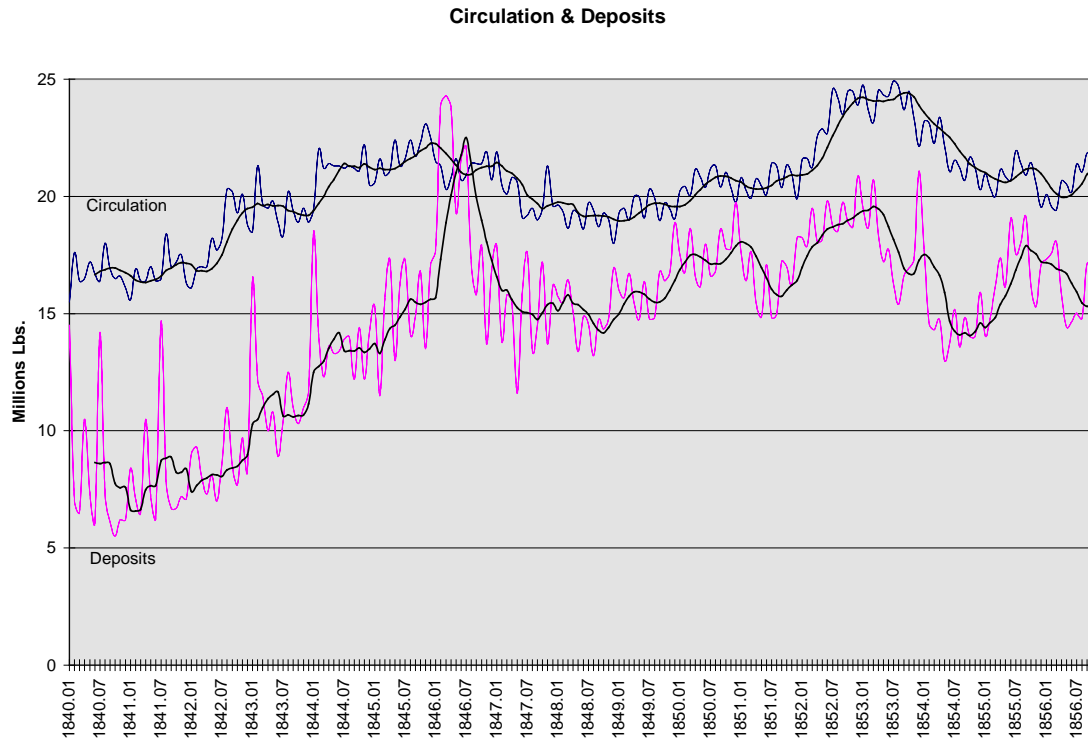
As noted this is also the position of modern quantity theory approach: The deposit-currency ratio (D/C) is controlled by the public not the bank. But the deposit-reserve ratio (D/R) is controlled by the bank. A plot of these two ratios then will give a measure of public and bank's portfolio adjustments of the time as in figure 10.

From Tooke's position what the banks could do was extremely limited. The bank could not voluntarily diminish circulation as the Currency school's ultimate policy implication envisioned. To reduce its securities (Bank's assets) the bank must reduce its liabilities. Yet the diminution may fall wholly upon deposits with circulation remaining just where it was.

In this context patterns of the movements of the behavior of the monetary authorities, commercial banks and public must be of interest (figures 10 and 11). Moving averages of bank note circulation and deposits in general move parallel suggesting that public's portfolio adjustments for all of this period exhibit stable behavior. Such stability reflects that public's change of "taste", expectations or speculation could not be the cause of sudden gold drains and the ensuing banking crises.

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was asked: "Q. 1691. Are there any grounds for considering the deposits of the Bank of England as currency ? - No. I think not. Q.1692. Do you consider that any deposits, merely in their character of deposits can be considered as currency ? No I do not. 1693. Will you state what, in your opinion, forms the distinction between currency and deposits ? I consider that, looking broadly at deposits and currency, they are quite distinct; they have little to do with each other. But I conceive that the use of deposits is one of the banking expedients which is available for economizing currency, along with a great many others." *Report from Select Committee on Banks of Issue with minutes of evidence and appendix and indexed, 1840.*



Source: Tooke (1884), *History of Prices* Vol. VI, p. 544-557.<sup>51</sup>

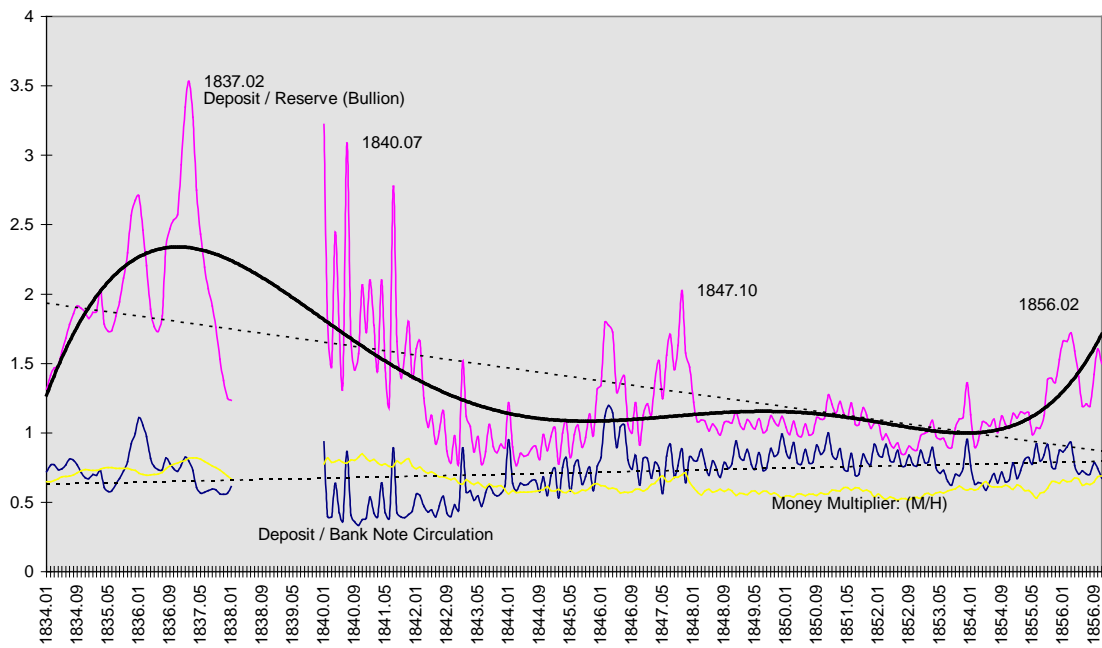
**Figure 10.**

If we define the sum of bank note circulation and reserves (Bullion) as high powered money  $H$  and the ratio of banknote circulation ( $C$ ) to high powered money ( $H$ ) as the money multiplier ( $C/H$ ), then this ratio as in figure 11, also exhibits stability.

But the bank's behavior, as reflected in the declining ratio of deposits ( $D$ ) to bank reserves  $\text{\textcircled{R}}$  suggests that banks liabilities to public were in decline (fitted linear trend) and highly volatile. The high points of ( $D/R$ ) are precisely the banking crises points in 1837, 1840, 1847 and the coming 1857 crises. The transmission mechanism to crises seems to have been not public's behavior as reflected in the relative constancy of ( $C/D$ ) rather wide fluctuations in gold reserves, the cause of which is yet to be established.

<sup>51</sup> The patterns of bank note circulation and deposits varies significantly when we move from Bank of England to London Banks and Country banks. See Douglas K. Adie, 1970 'English Bank Deposits before 1844', *Economic History Review*, Second series, Vol. XXIII, No. 2, pp.285-297.

**Bank and Public Portfolio adjustments :  
Deposit/Bank note circulation, Deposit / Reserves, Money multiplier**



Source: Tooke (1884), *History of Prices* Vol. VI, p. 544-557.

**Figure 11.**

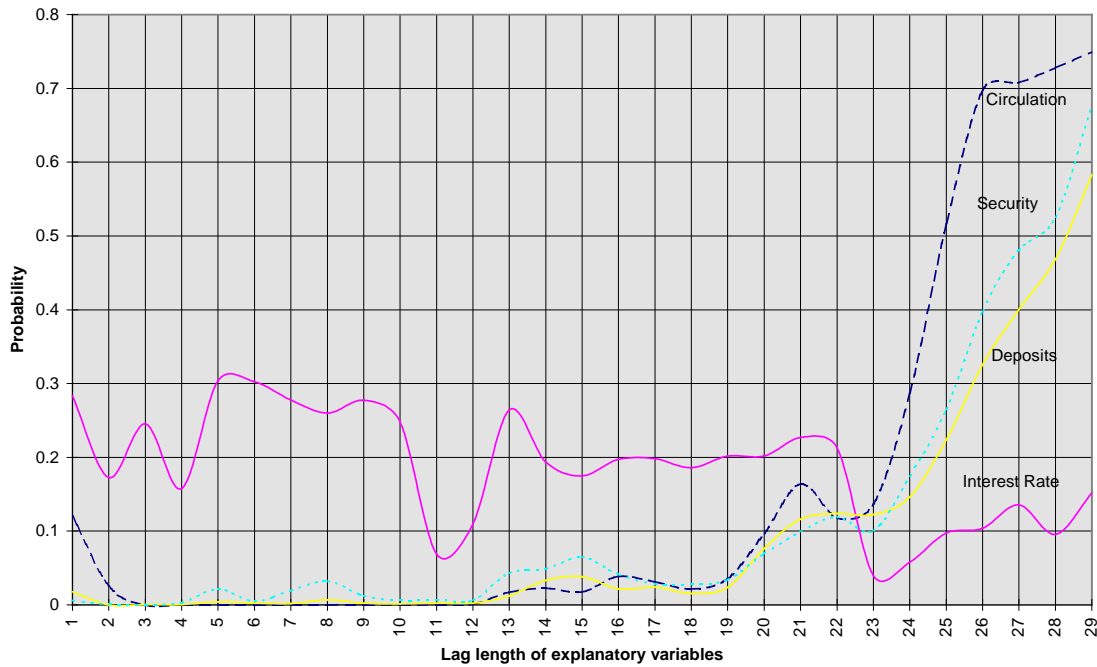
**4.6 Bullion movement 1834-56:**

A good candidate for pair wise causality of bullion are the four explanatory variables circulation (bank note), securities<sup>52</sup>, deposits and interest rate, which were repeated up to 29 lag lengths. The results of these 116 tests are consolidated and summarized in the following plot.

For 1834-1856 the conclusions of previous Granger causality is reversed. Note that for this period the price of gold was fixed.

<sup>52</sup> The distribution of securities into private and public is a reflector of Bank's portfolio adjustment to fixed and variable rates of returns on these securities. Public securities had a fixed rate of return.

**Probability of the Null Hypothesis: Bullion is not Granger Caused by  
Bank note Circulation, Securities, Deposits, Interest rate**



**Figure 11.**

For lag length 1 through 22 the only variable with a relatively high probability is interest rate. At approximately a probability of 30% we may reject the null hypothesis that reserves are not granger caused by interest rate.

The low probability of bank-note circulation however gives full support to Tooke’s proposition. Gold drain cannot be attributed to undue expansion of bank-notes.

The low probability on Securities is against Tooke’s proposition. According to Tooke it was undue speculation on securities by banks in buying public and private securities that was the cause of bank’s failures. That probability is less than 10%.

The low probability on deposit reflects lack of any causality between deposits and reserves. Pegging gold reserves to deposit and considering deposits as money from Tooke’s position was an erroneous proposal.

In conclusion the most significant variable explaining Bullion movement has been interest rate.