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A Reinterpretation of Classical Monetary Theory*

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I. Introduction

Relevance to current policy issues is usually not the motivation for studying the history of economic theory. However, questions about the practicality of conducting monetary policy in a deregulated financial system by controlling the monetary aggregates are stimulating interest in convertibility as an alternative to our present monetary arrangements [3; 6; 66]. Since classical writers were mainly concerned with monetary theory and policy under a gold standard, it is to be expected that renewed attention will be devoted to classical monetary theory.

My aim in this paper is to show that, contrary to received views about classical monetary theory, it was not based on the quantity theory of money. On the contrary, it was based on a theory of a convertible, competitively produced money supply that was fundamentally different from the quantity theory. Using the modern theory of a competitive money supply, we can now rigorously derive many of the basic propositions of classical monetary theory that have been denied or misunderstood by modern theorists operating within the framework of the quantity theory.

Received views about classical monetary theory can be summarized by the following propositions:

1. Classical monetary theory was based on the quantity theory [5, 145–76; 42, 143; 61, 59].
2. In classical theory the role of convertibility was to impose a limit on the reserves against which the banking system could create nominal balances. Under convertibility an excess supply of nominal balances that led to an increase in the price level would eventually be reversed by a loss of reserves and a consequent contraction of nominal balances [3, 13; 42, 153].
3. For convertibility to be effective, the banking system had to maintain a stable ratio between their reserves and the nominal balances they created. Since the banking

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system would not necessarily do so of its own accord, the monetary authority had to impose the ratio on the banking system [42, 153-6; 51, 76; 67, 221].

4. Though some, but not all, classical theorists did recognize the distinction between the expansion opportunities open to any single bank and those open to the entire banking system, classical theorists generally lacked an adequate theory of the process of money creation by a fractional reserve banking system that properly took account of this distinction [19, 152-3; 47, 32; 55, 730; 67, 239].

5. International monetary equilibrium was maintained, in the classical theory, by the Humean price-specie-flow mechanism (PSFM) that entails adjustments in the relative price levels of countries experiencing balance-of-payments disequilibrium [5, 209; 42, 142; 67, 293].

6. Classical theory incorrectly subscribed to Say's Law (Identity) and, thus, could not adequately explain the process of price-level adjustment implicit in the quantity theory. And lacking a real balance effect, it illegitimately dichotomized the process of price determination between the real and the monetary sectors [5, 145-76; 42, 158-60].

Each of these propositions, at least in relation to a major group of classical monetary theorists, is incorrect. The critical mistake is the assumption that classical theorists used the quantity theory to explain price-level determination under convertibility. Most classical theorists used the quantity theory only to explain price-level determination for an inconvertible paper currency. But under the gold standard, the price level was determined by the value of gold, not the quantity of nominal balances.[1] A competitive process, sometimes described as the real bills doctrine or the law of reflux, determined the quantity of nominal balances produced by the banking system under convertibility. No fixed relationship between gold reserves and nominal balances was, or needed to be, maintained because it was not possible, under convertibility, for the nominal quantity of money produced by the banking system to affect the price level. Instead, nominal balances fluctuated with "the needs of trade." And with the price level determined by convertibility, no monetary theory of price-level adjustment was necessary. There was no need for a real balance effect and no inconsistency in maintaining Say's Identity. The law of reflux, in fact, is equivalent to Say's Identity.

Without relying on the balance-of-payments adjustment mechanism, the modern theory of a competitive money supply demonstrates the endogeneity of the nominal quantity of money produced by the banking system. As with any other competitively produced commodity, the output of nominal cash balances depends on the marginal costs and the marginal revenues of competitive producers. The money-multiplier analysis of deposit expansion, according to which the nominal money supply is (or can be made) an exogenously determined policy variable, has no role in the theory of a competitive money supply just as it had none for most classical theorists.[2]

1. In Fullarton's words:

The value of a really convertible currency must always be identical with the value of the coin into which it is convertible, and can only vary with variations in the value of coin [14, 69]

2. Hicks [24, 59-60] recognized, almost in passing, the distinction between the quantity theory and the classical theory of a convertible currency. In the latter the money stock becomes an endogenous variable while in the former it is an exogenous one.

The paper is organized as follows. In the next section I shall sketch a model of a competitively produced money and show the validity within this model of such allegedly invalid propositions often attributed to the classical theorists as the dichotomy of the real and the monetary sectors and Say's Law (Identity). In section three I shall compare and contrast the quantity theory and my interpretation of the classical money model. I turn, in section four, to the role of competition in classical monetary theory. Next I use the distinction between the quantity theory and the competitive money model to suggest an explanation of Adam Smith's neglect of PSFM and to offer a parallel explanation of the dispute between the Currency and Banking Schools. In section six I shall compare my version of the classical theory with the modern restatements of the classical theory by Patinkin and others and show the equivalence between Say's Identity and the law of reflux. Finally, in section seven I discuss the implications of the classical model for contemporary monetary theory.

II. A Model of a Competitive Supply of Money

The modern theory of a competitive money supply was developed independently and along somewhat different lines by Klein [31] Thompson [62] and Hayek [20]. Much of their work was foreshadowed in the "New View" of financial intermediaries, associated with, among others, Gurley and Shaw [18] and Tobin [65]. The notion of a competitive money supply was also developed in a neglected article by Rueff [52].

The truly novel contribution of Klein, Thompson and Hayek was their argument that even with costless creation of nominal cash balances, a legally unconstrained, competitive monetary system would not, as Friedman,[3] Pesek and Saving,[4] Johnson[5] and Patinkin[6]

3. Friedman wrote,

This analysis, then, leads to the conclusion that some external limit must be placed on the volume of a fiduciary currency in order to maintain its value. Competition does not provide an effective limit, since the value of the promise to pay, if the currency is to remain fiduciary, must be kept higher than the cost of producing additional units. The production of a fiduciary currency is, as it were, a technical monopoly, and hence, there is no such presumption in favor of the private market as there is when competition is feasible [12, 7]

Friedman fails to explain why competition would not force competing issuers of fiduciary units to guarantee that they would not overissue. Without such a guarantee, their issues would not be acceptable to the public. The guarantee, of course, would likely take the form of a commitment to convert into gold. Friedman does not explicitly deny that competition is possible under a gold standard. But he does deny that the gold standard would arise spontaneously through competitive forces. As Klein [31, 429] observed, he seems to assume that competing money producers have no way of differentiating their products.

4. Pesek and Saving maintained,

If we have a product, any product, the marginal cost of production of which is assumed to be zero, then the following propositions of value theory hold:
a. Competition among producers of any good, monetary or non-monetary, results in a determinate output and a zero price; a reciprocal of this price is, by definition, indeterminate . . .
b. Output restrictions (outside restraint, monopoly, etc.) result in a determinate output and price, both positive . . .
If dominant money exists but the banking system is not restricted by two qualitative restraints, [instant repurchase clause (convertibility) and a prohibition on the payment of interest on money] the banking industry will destroy itself as a money producer by being competitively driven to deteriorate the quality of its product: money will be converted into a money-debt and, ultimately, into pure debt [45, 129].

5. Johnson's words were:

If deposits cost nothing to create and yet the assets held against them yield a positive return, banks subject to no restraint will be under competitive pressure to expand the nominal money supply until its purchasing power is reduced to zero: at best, the money supply so determined will be in neutral equilibrium [27, 135].

had asserted, generate an infinite, or indeterminate, price level. Klein [31, 429-30] and Hayek [20, 23] pointed out that only if competing money producers were producing indistinguishable monies that did not bear the name or trademark of the issuer would competition generate an infinite price level. However, the violation of another money producer's trademark is not a requirement of competition, it is an infringement of property rights that we call counterfeiting. Thompson, however, differed from Klein and Hayek on one significant point. While Klein and Hayek maintained that competition between money producers would, even without convertibility, ensure the purchasing power of their monies, Thompson held that a finite price level would only be achieved if money producers committed themselves to convert their monies into a real asset at a stipulated rate of exchange. While conceding that money producers must resort to convertibility to ensure a finite price level, Thompson differed from Friedman, et. al. in arguing that, if property rights are enforced, convertibility results from competitive forces, not from a governmentally imposed obligation on the banking system.

I shall now give a brief account of Thompson's model since I regard it as closest in spirit to the classical money model.

Assume that a proper subset of individuals within an economy--let us call them bankers—can ascertain costlessly the probability of default by any borrower; suppose, too, that their costs of bookkeeping and enforcing payment are zero. Finally, assume that bankers are sufficiently numerous to make collusion prohibitively costly. Since bankers are the lowest-cost suppliers of credit, non-bankers borrow only from bankers. Non-bankers obtain credit by giving bankers IOUs that bear a competitive interest rate plus a risk premium. In exhange for these IOUs, the bankers give the non-bankers IOUs of their own which, because the credit of bankers is understood to be superior to that of non-bankers, are generally accepted as payment. If the credit of non-bankers were as good as that of bankers, non-bankers would issue their own debt when making payment rather than exchanging debt with bankers and using the bankers' debt for payment.

Since they can create debt costlessly, bankers earn the difference between the interest on IOUs they receive from non-bankers and the interest on IOUs they issue in exchange. But competition forces bankers to raise the interest on their debt as long as further profits would accrue from issuing additional debt, thereby dissipating any profit that would have accrued from the interest on IOUs obtained from non-bankers.

The second part of this sentence is inconsistent with the first part. A neutral equilibrium without a determinate price level does not imply zero purchasing power. It means that the price level and the rate of inflation are not restricted to unique values. Changes in the rate of inflation would be matched by changes in the rate of interest paid on money, leaving money holders indifferent to changes in the rate of inflation. This is the kind of equilibrium envisioned by Gurley and Shaw [18, 254-5] in a "laissez-faire banking system." The price level and rate of inflation are also indeterminate in this sense in Klein's version of a competitive money model.

6. Patinkin argued as follows:

Note that under the assumption of zero costs it is essential to assume that the right to issue money is quantitatively restricted in some form or other. For otherwise individuals would continue producing money until the value of the marginal product was also zero; that is, they would issue an infinite quantity of money which would be valueless in terms of purchasing power over commodities [44, 170]

Although of the authors I have quoted in this and the previous three footnotes, only Pesek and Saving categorically deny that a competitive money supply under convertibility would maintain a finite price level, all of them do suggest that competition would lead to an infinite price level unless some exogenous constraint (such as a legal convertibility requirement) were imposed on it. The insight of the theory of a competitive money supply is that convertibility itself would arise from competitive forces.

A delicate question arises here. It is the anticipated real interest rate that is the incentive for holding the bankers' IOUs. How can this real interest be paid? Unless bankers commit themselves to convert their IOUs into an asset which they cannot create costlessly, the prospect of real interest seems illusory. There is no reason to believe a promise to pay interest unless the value of the IOU is fixed in real terms by a contractual commitment to convert either on demand or at a specified redemption date. This is Thompson's [62, 432-33] reason for arguing that competition would compel banks to commit themselves to convertibility. Ronald Coase [8] has employed a similar argument in a different context.[7]

By giving holders of his IOUs the right of conversion into a real asset at a predetermined rate, a banker can guarantee them a stipulated real rate of interest. A banker may do so by establishing convertibility into a real asset expected to appreciate at a rate equal to the real rate of interest, or by announcing that the conversion rate between his IOUs and a real asset of constant value will be periodically increased in the future.[8] The former arrangement bears some similarity to the classical gold standard.[9] Apart from periods of rising prices following unanticipated gold discoveries, prices in terms of gold generally fell during the nineteenth century. Thus, money holders usually did receive some implicit interest. That money holders still bore some positive cost (given that real interest rates were generally greater than the rate of deflation) can be attributed to the real costs of producing money or to monopolistic elements in the banking structure of most countries. In Scotland, where a free banking system evolved in the eighteenth century and continued until Peel's Act of 1844 subjected it to the regulations governing banking elsewhere in Great Britain, interest was paid on deposits and money-holding costs were less than in England [7, 68; 14, 92].

The competitive money model I have outlined has the following properties:

1. The assumption that banks can produce cash balances costlessly implies that they bear no cost of holding reserves of the standard asset (gold). This would be possible if confidence in banks were such that they did not need to hold any reserves regardless of their output of cash balances. Such a situation would imply that banks have no demand to hold gold.[10] Figure 1 shows the determination of the price level, P, and the spread between

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7. Coase's argument is that a monopolist trying to maintain an artificially high value of a durable good by withholding part of its supply would be unable to do so without promising to repurchase the good at the original price. The reason is that buyers of the good will anticipate that the monopolist would later sell additional units that he originally had withheld until the price of the good were reduced to the competitive level. Given such expectations, no buyer would pay more than the competitive price. To guarantee to buyers that he will not "cheat," the monopolist has to make a commitment to preserve the value of the good, for example by promising to repurchase at the original price on the demand of the buyer. The problem of the monopolist is analogous to the problem of the money producer seeking to maintain a value for his money above the physical cost of producing it. Convertibility is the equivalent of a repurchase clause. I am indebted to Armen Alchian for drawing my attention to the analogy between Coase's example and a convertibility commitment on the part of a money producer.

8. For an alternative form of convertibility that would stabilize an index of wage rates and, thus, would be a kind of labor standard, see Thompson [63].

9. In the competitive model, however, the asset into which money is convertible does not necessarily function as a medium of exchange as did gold under the gold standard. The phenomenon of currency-switching in times of crisis when the public seeks to switch from holding bank monies (notes and deposits) to reserve money (gold) may have been a significant factor in nineteenth century business cycles. This phenomenon is not possible in the purely competitive model outlined in this paper. For a discussion of the implications of this assumption of the competitive model see below, and Glasner [16].

10. An alternative explanation would be that gold was yielding the competitive rate of interest which could occur if gold were appreciating at a rate equal to the rate of interest. An asset can appreciate at a rate equal to the rate of interest in equilibrium only if it provides no current services of any value. That would mean that the current demand for gold for monetary uses was small relative to the total stock. See discussion below in section VI.
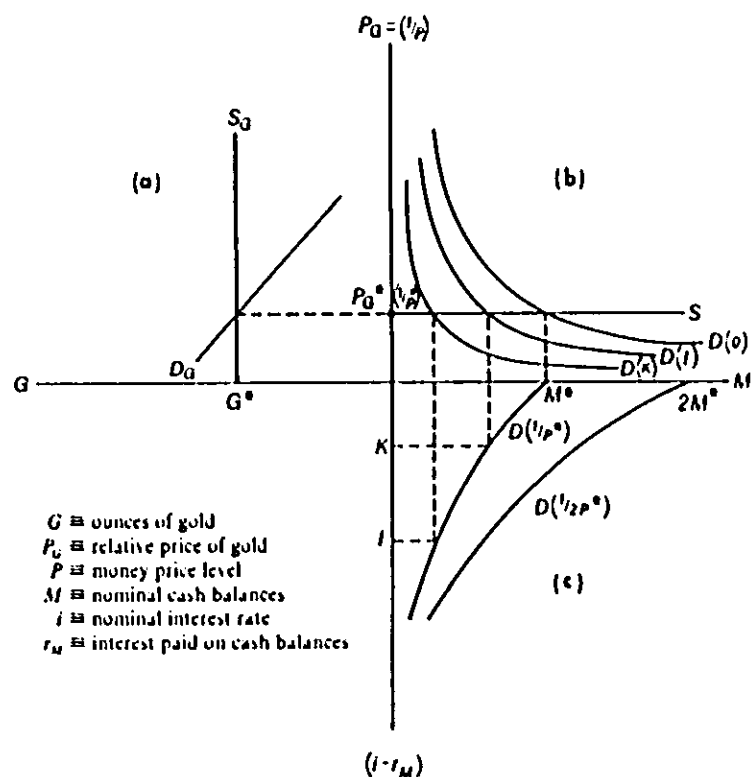
G ≡ ounces of gold
P_G ≡ relative price of gold
P ≡ money price level
M ≡ nominal cash balances
i ≡ nominal interest rate
r_M ≡ interest paid on cash balances

Figure 1

the interest rate on loans and the interest on money, $i - r_M$. In panel a the relative price of gold, P_G, is determined on the assumption that banks hold no gold reserves. Given the exogenously determined conversion rate, CR, P_G uniquely determines the price level, P. Their precise relationship is given by the equation

$$(CR)(1/P) = P_G.$$

Without loss of generality, we choose CR so that P_G equals $1/P$; P_G and $1/P$ can then be measured simultaneously along the vertical axis. In panel b a family of rectangular hyperbolic demand curves depicts the relationship between the amount of nominal cash balances demanded, M and $1/P$. The demand for real cash balances along each demand curve is constant and depends on $i - r_M$. In panel c the demand for real cash balances as a function of $i - r_M$ is shown by a family of demand curves (each corresponding to a given price level). Competition ensures that $i - r_M$ equal the marginal cost of maintaining cash balances held by the public. If doing so is costless, the supply curve of cash balances in panel c, indicating the banking industry's output of money as a function of $i - r_M$, coincides with the horizontal axis. Thus, the equilibrium amount of cash balances is represented by the point where the demand curve in panel c corresponding to the price level determined in panel a touches the horizontal axis.[11] Thus, the quantity-theoretic proposition that the

11. If there were some positive, but constant, marginal cost of maintaining the cash balances held by the public, the supply curve would be perfectly elastic at *ik*, where *k* is the cost of permanently issuing one unit of money. If there were increasing marginal costs of producing cash balances, the supply curve would be upward sloping. In other words,
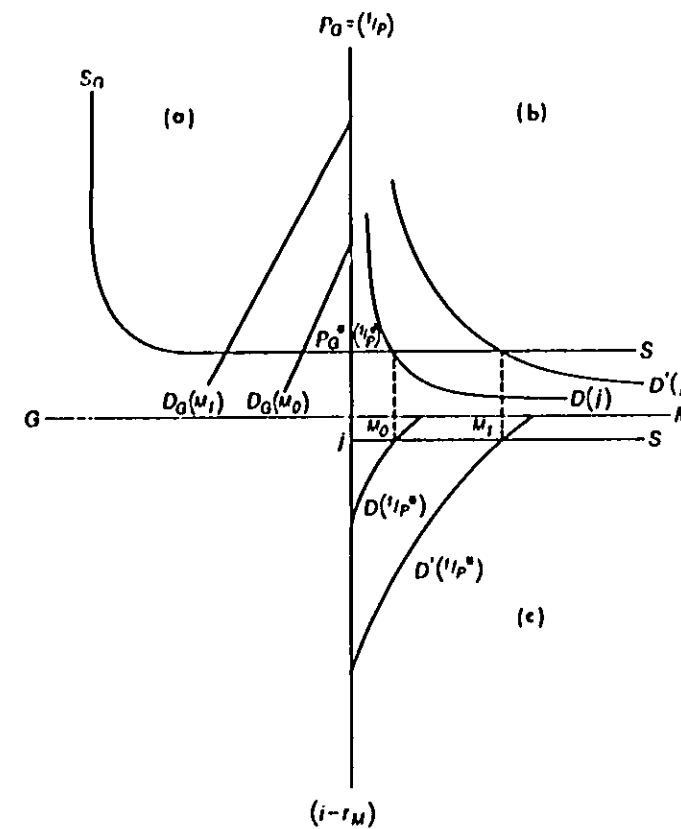
$$(i - r_M) = ik(M).$$

Figure 2

price level depends on the exogenously fixed nominal quantity of money is reversed in the competitive model. Instead, the supply of cash balances is perfectly elastic with respect to the price level determined by convertibility and with respect to the spread between the nominal interest rate on loans and the nominal interest rate on money.

2. Essentially similar conclusions follow even if we relax the assumption of costless production and assume instead that the demand for gold by the banking system of the country whose price level is being determined is small relative to the international market in which the price of gold is determined.[12] Figure 2 illustrates the determination of P, $i -$

where $k(M)$ is the marginal cost of permanently issuing cash balances held by the public as a function of the quantity of cash balances. Note, however, that even if the supply curve in panel c were upward sloping, the supply curve in panel b would still be perfectly elastic with respect to $1/P$.

The most explicit formulation of such a money model was by Laughlin [35]. For an excellent study of this unduly neglected theorist see Girton and Roper [15]. Although Laughlin recognized the similarity of this theory to Adam Smith's, he regarded the quantity theory as the dominant classical theory and sought to differentiate his own theory from the classical theory.

12. McCloskey and Zecher [37, 360-1] argue that the small country assumption was not an unrealistic one for the United States and certainly not for Great Britain on the eve of the demise of the classical gold standard in 1913. Their argument was based on shares of world income rather than shares of the world money supply or gold stock, but given the existence of a non-monetary as well as monetary demand for gold, it is unlikely that normal fluctuations in the monetary demand for gold within a single country would have had much impact on the world price of gold.

A sufficiently large shock that caused an increase in the demand for money and the demand for gold (especially if, as is likely in such a case, the shock were international) would lead to a general deflation as the relative price of gold rose. In such periods the cost to banks of creating cash balances would be rising because of an increased derived demand for gold reserves. Thus, even with an increased real demand to hold cash balances, the combination of a falling
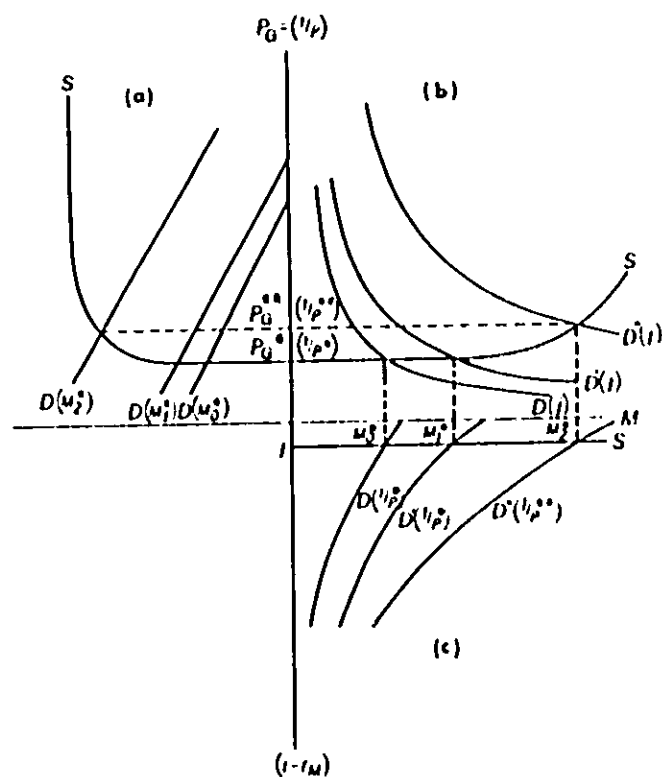
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Figure 3

r_M, and M, under these assumptions. In panel a determination of the relative price of gold for a small country is shown. Since the price of gold is determined internationally, the supply curve facing a small country is perfectly elastic at the prevailing world price unless the domestic demand for gold increases greatly. Hence, the supply curve is drawn with an L-shape. The demand of the banking system for gold is a function of its output of cash balances and each demand curve drawn in panel a corresponds to a different output of cash balances. M and $i - r_M$ are determined in panels b and c as they were in Figure 1, except that the supply curve of cash balance with respect to $i - r_M$ is drawn below the horizontal axis in panel c to reflect the assumption that banks incur a positive cost of creating and maintaining cash balances in circulation. Thus, for a small country, the supply of money is perfectly elastic (at least in the neighborhood of equilibrium) at a price level determined by convertibility.

3. Even if the demand for gold is not insensitive to changes in the demand for money, the relative price of gold and the price level would be unaffected by domestic changes in the demand for money, provided that domestic changes in the demand for money are relatively small, or that they are correlated with changes in the opposite direction elsewhere. They would then affect only the quantity of money. Associated changes in the domestic gold stock would be accomplished with no changes in the price level. In Figure 3, I illustrate

price level and a rising cost of creating nominal cash balances, the nominal stock of money created by the banking system might well fall in such a period. The correlation between a falling nominal money stock and a falling price level would be consistent with the quantity theory even though the correlation did not come about in the way envisioned by the quantity theory. The susceptibility to such shocks is an important exception to the otherwise desirable properties of the competitive money supply model under a gold standard.

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two cases in which the demand for money for changes. In one case, the demand shift (from D to D' in panels b and c) is relatively small so the corresponding shift in the demand for gold in panel a is small and does not alter the relative price of gold or the price level. In the other case, the demand shift (from D to D'') is sufficiently large to cause a shift in the demand for gold that does alter the relative price of gold and the price level. If the supply curve of cash balances in panel c were not horizontal, the spread between the rate of interest and the interest paid on money would also be affected. But as long as demand changes were not so great as to affect the relative price of gold, monetary equilibrium would be maintained through variations in r_M with no change in either P or i which, in the competitive model, are both invariant with respect to (small) changes in the supply of and demand for money.

4. Because money yields competitive interest in this model, the optimum quantity of money in the sense of Bailey [2], Samuelson [53; 54], Friedman [13], and others, is automatically provided. Thus, the equilibrium of a model with a competitively produced money supply is Pareto-optimal. Because of the costliness of holding a non-interest-bearing, yet (by assumption) costlessly produced, money, the equilibrium of the standard general equilibrium model with an exogenous money supply added, as in Patinkin [43] is not Pareto-optimal.[13]

5. Furthermore, given that it is costlessly produced by a competitive banking system and yields competitive interest, money is not a part of net wealth and there is no real balance effect. Excess demands in the real markets are functions of relative prices alone.

6. Since money yields competitive interest, the demand for money is independent of the interest rate. Thus, the demand for money corresponds to the simple Cambridge equation and can be drawn as a rectangular hyperbola with respect to the inverse of the price level (Figure 1b). Such a demand for money was held by Patinkin [43, 162–95] to imply a violation of Walras's Law. However, in the competitive model, the excess demand for money is not given by the negative value of the excess demands of the real sector. The reason is that we can formally define a market for "money-backing" services in which the public exchanges relatively illiquid IOUs (bonds) for the perfectly liquid IOUs (money) created by the banks.[14] Such transactions, however, do not affect the market for bonds in the real sector where their price is determined; they only affect the spread between the return on bonds and the return on money. Thus, any excess demand for (supply of) money is offset not by an excess supply of (demand for) real goods but by an excess supply of (demand for) IOUs of the public to be held by the banks as backing for the IOUs they issue.[15] The law of reflux is simply a recognition of the operation of this market.

7. Owing to the existence of this "extra" market in the monetary sector, the absence of a real balance effect implies that the real and the monetary sectors are validly dichotomized in the competitive money model, and

13. Samuelson's contention [53, 535; 54, 9–10] that the amount of cash balances held under laissez-faire is not optimal is therefore incorrect. See Thompson [62, 433–7] for a proof of Pareto-optimality.

14. "Money-backing" does not just refer to the reserves of the standard asset (e.g. gold) into which the bank promises to convert its notes. Any money created by a bank is "backed" by an asset the bank acquires in exchange, for example, the IOU the bank acquires from a member of the public when it creates the money as a loan. The IOU can be said to provide the bank with "money-backing" services.

15. Patinkin [43, 295–310], following Modigliani [40, 183–4] acknowledged the validity of a dichotomy for a pure inside money economy. However, he maintained that the price level in such a system would be indeterminate unless the central bank arbitrarily determined some nominal variable. The argument in this section, which I believe would have been accepted by classical monetary theorists, is that a nominal variable is determined by the convertibility commitment imposed on banks by competition.

8. Say's Law (Identity) holds without implying indeterminacy of the price level since the value of the excess demands for all real goods identically equals zero and the price level is fixed by convertibility.[16]

Thus, a number of supposedly invalid propositions attributed to classical economists turn out to be essential properties of a logically consistent model of a costlessly and competitively produced money. The relationship of a rather different theory — the quantity theory — to classical monetary theory is the question I shall take up in the following section.

III. Classical Monetary Theory and the Quantity Theory

In a sense, there are three classical monetary theories: a) the theory of a purely metallic currency, b) the theory of an inconvertible paper currency, and c) the theory of a competitive convertible paper currency. Only b) corresponds to a strict quantity theory of money in which price-level changes are caused by, and proportional to, changes in nominal balances. Unfortunately, many classical theorists sometimes confused their theories by introducing quantity-theoretic propositions into arguments to which the quantity theory was not applicable. Such misplaced propositions have fostered the misconception that the quantity theory was the essential classical monetary theory [42, 143].[17]

Having already discussed the theory of a competitive convertible currency, I now turn to the theory of a purely metallic currency and the theory of an inconvertible paper currency.

The first point to note is that classical theorists recognized that the markets for metals such as gold are international. Since transportation costs for gold are relatively low, its value must, absent trade barriers, be approximately equal in all countries.[18] Moreover,

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16. Even various authors, such as Modigliani [40] and Samuelson [53] who admit the possibility of a valid dichotomy between the real and monetary sectors reject the validity of Say's Identity in a monetary economy.

17. J. S. Mill recognized the limited applicability of the quantity theory. He was, perhaps, in error or incautious in not distinguishing between a pure metallic and an inconvertible paper currency when he wrote [38, 493], "It is to be remarked that this ratio would be precisely that in which the quantity of money had been increased. If the whole money in circulation was doubled, prices would be doubled. If it was only increased one-fourth, prices would rise one-fourth." But later [38, 524] Mill wrote, "I apprehend that bank notes, bills or cheques, as such, do not act on prices at all. What does act on prices is Credit in whatever shape given, and whether it gives rise to any transferable instruments capable of passing into circulation or not." And Mill went on to compare the effects on prices of a convertible with the effects of an inconvertible currency [38, 544]

Up to this point, the effects of a paper currency are substantially the same, whether it is convertible into specie or not. It is when the metals have been completely superseded and driven from circulation, that the difference between convertible and inconvertible paper begins to be operative. When the gold or silver has all gone from circulation, and an equal quantity of paper has taken its place, suppose that a still further issue is superadded. The same series of phenomena recommences: prices rise, among the rest the price of gold and silver articles, and it becomes an object as before to procure coin in order to convert it into bullion. There is no longer any coin in circulation; but if paper currency is convertible, coin may still be obtained from the issuers, in exchange for notes. All additional notes, therefore, which are attempted to be forced into circulation after the metals have been completely superseded, will return upon the issuers in exchange for coin; and they will not be able to maintain in circulation such a quantity of convertible paper, as to sink its value below the metal which it represents.

18. Smith wrote,

But no commodities regulate themselves more easily or more exactly according to this effectual demand than gold and silver; because, on account of the small bulk and great value of those metals, no commodities can be more easily transported from one place to another, from the places where they are cheap, to those where they fall short of this effectual demand . . . .

It is partly owing to the easy transportation of gold and silver from places where they abound to those where they are

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uniformity of price levels is ensured not just by gold shipments, but also by the arbitrage of all tradable commodities [11, 33-5].

Second, if gold can be produced at constant cost, the value of gold equals the cost of production. However, in the short run at least, costs rise rapidly as the rate of output increases, so the flow supply of gold is small relative to the stock. Since the stock is virtually fixed in the short run, short-run changes in the value of gold must be caused by changes in demand, not changes in supply. Furthermore, only unanticipated changes in supply can have much effect on its value because anticipated changes in supply would have already been discounted.

Third, if the stock of gold were unexpectedly doubled, the value of gold would not, in general, fall by half. For a change in the stock of gold to cause an inversely proportional change in the price, the demand for gold must be unit-elastic in the relevant range. Although this may be presumed to be true of the monetary demand for gold, it need not be true of the non-monetary demand for gold.

Fourth, in any country, changes in the stock of gold do not affect the domestic price level. This follows from the fact that the value of gold is determined in an international market. Thus, if the stock of gold in one country were doubled, gold would be exported until the amount of gold in the country fell to the original level. No change in price levels would be required. Only insofar as the increase in the domestic gold stock changed the world's stock of gold enough to alter the world price level would any domestic price-level change be implied [10, 35].

Only under an inconvertible paper currency does the quantity theory become applicable. Since there are no non-monetary uses for an inconvertible paper currency, the absence of money illusion implies that changes in the money stock lead to proportional change in the price level. If exchange rates fluctuate freely, the effects of a change in the money stock in one country are confined to that country and do not affect prices in other countries. The quantity theory applies within each country and exchange rates vary to ensure purchasing-power parity. With *truly* fixed exchange rates, the price levels in all countries are determined by the world supply and demand for currency. A doubling of the world's stock of currency doubles the price level in each country. And the international distribution of currency reflects the operation of the balance-of-payments mechanism [10, 35].

Among the leading figures in classical monetary theory, there was some confusion about these propositions. David Hume, in particular, was in error about all four propositions concerning a pure metallic standard. Hume [25, 62-3] misapplied the quantity theory, which was relevant only to the case of an inconvertible paper currency, to the case of a pure gold money, and also gave an incorrect analysis of the case of a competitive convertible currency [25, 35-61]. Adam Smith [58] avoided Hume's incorrect application of the quantity theory to a metallic currency and presented a substantially correct analysis of a competitive convertible paper currency and the mechanism of international adjustment. David Ricardo [48], however, seems at times to have lapsed into some of Hume's errors in his analysis the international adjustment mechanism under a gold standard and convertibility — perhaps because he was misled by his own quantity-theoretic analysis of the international

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wanted that the price of those metals does not fluctuate continually like that of the greater part sof the other commodities, which are hindered by their bulk from shifting their situation, when the market happens to be either over or under-stocked with them [58, 404-5]

adjustment mechanism under an inconvertible paper currency.[19] Henry Thornton [64] was essentially correct on all key points as was John Stuart Mill [38], who explicitly limited application of the quantity theory to the case of an inconvertible currency [24, 60 footnote]. Nassau Senior [56] was correct on all points except for failing to see that national price levels could not vary independently under a gold standard. And on all these points the Banking School showed an understanding superior to that of the Currency School.

IV. The Role of Competition in Classical Monetary Theory

Because the assumption of competition underlying much of classical monetary theory is overlooked, many classical monetary propositions seem puzzling or wrong. The key point to understand is that classical theorists regarded competition as a constraint on individual banks.[20] It was competition and not merely a legally imposed requirement to maintain convertibility into gold that restrained banks in creating notes or deposits. Indeed, as Thompson [62] has shown, and as many classical writers including Adam Smith understood, since inconvertible money would not be held by the public when they could hold convertible money, competition would force convertibility on banks.[21]

If banks offer distinguishable competing monies, the distinction between the ability of any single bank to expand and that of the entire banking system is invalid. This distinction, which lies at the heart of the modern money-multiplier analysis, was not made by most classical theorists and their failure to do so has elicited criticism ever since.[22]

The distinction first began to be made by members of the Currency School in arguing

19. Some writers have defended Ricardo against the charge of inconsistency on this point. They maintain that Ricardo did distinguish between the quantity theory applicable to an inconvertible currency and a cost-of-production theory applicable to a convertible currency. See Girton and Roper [15, 613] as well as references cited there. That interpretation of Ricardo is consistent with the view of classical theory I have presented in this paper. One authority [21, 59-60] who maintains that Ricardo adhered to only one theory — the quantity theory — acknowledges that this did involve Ricardo in an inconsistency.

20. As Smith put it:

> The late multiplication of banking companies in both parts of the united kingdom . . . instead of diminishing, increases the security of the public. It obliges all of them to be more circumspect in their conduct, and, by not extending their currency beyond its due proportion to their cash, to guard themselves against those malicious runs, which the rivalship of so many competitors is always ready to bring upon them. It restrains the circulation of each particular company within a narrower circle, and *reduces their circulation notes to a smaller number* [my emphasis] [58, 313]

Also see Fullarton [14, 89-92] "But, far from contributing to the eventual enlargement of the aggregate mass of the banknote circulation, the effect of this competition . . . was obviously to keep it down." [14, 90]

21. Smith's words were:

> A positive law may render a shilling legal tender for a guinea; because it may direct the courts of justice to discharge the debtor who has made that tender. But no positive law can oblige a person who sells goods, and who is at liberty to sell or not to sell or not to sell, as he pleases, to accept of a shilling as equivalent to a guinea in the price of them. Notwithstanding any regulation of this kind, it appeared by the course of exchange with Great Britain, that a hundred pounds sterling was occasionally considered as equivalent, in some of the colonies, to a hundred and thirty pounds, and in others to so great a sum as eleven hundred pounds currency; this difference in the value arising from the difference in the quantity of paper emitted in the different colonies, and in the distance and probability of the term of its final discharge and redemption" [58, 311]

22. C. A. Phillips, who perfected the money-multiplier analysis insisted, [T]he accepted statements of banking theory, with scarcely an exception, have made no such distinction, with the result that confusion, obscurity, and error prevail with reference to the most fundamental principles of the subject [47, 32] Also see Hayek [19, 152-3] Viner [67, 239-43] disputed Phillips's assertion and cited several authors who did make the distinction. Also see Schumpeter [55, 730].

for a statutory limitation on the note issue of both the Bank of England and the country banks. I shall discuss the Currency and Banking School positions in a later section. What I want to make note of here is the position of the Currency School that the banking system was inherently disposed toward expansion or was at least subject to such a tendency on occasion. Although convertibility provided an ultimate check on expansion, it only operated after an expansion was well under way. Thus, unless the initial expansion could somehow be stopped early on, a cyclical pattern of boom initiated by the overissue and bust caused by the contraction needed to maintain convertibility would result [67, 239-41].

This line of argument, however, assumes that convertibility is simply an exogenous check imposed on the banking system to prevent overexpansion. In other words, a bank's marginal revenue from creating additional cash is presumed to exceed its marginal cost. Thus, if they were unconstrained, all banks would tend to expand, in which case, no bank would be deterred from doing so by adverse clearings. Believing convertibility to be an inadequate brake on such expansion, the Currency School favored statutory limits on the power of the banking system to expand its note issue.[23]

But convertibility is itself the result of competition among banks. It is the means by which competing banks guarantee that their monies maintain the stipulated purchasing power and without which they could not induce the public to hold their monies. Each bank reaches an equilibrium in which the marginal revenue from producing additional balances equals the marginal cost of doing so and from which there is, consequently, no tendency to expand. Convertibility is not an exogenous constraint imposed to prevent banks from expanding without limit, it is a commitment competition forces on banks because without it, no bank could achieve a profit-maximizing equilibrium.

To be sure, all banks could expand simultaneously more easily than any single bank could because when expanding simultaneously banks would not face adverse clearings. But it is also true that, acting together, all sellers of a particular product could raise its price more easily than any single seller could. All this means is that competition is less of a constraint when banks don't compete than when they do.[24] The assumption usually made by classical economists was that banks, like other firms, would, in the absence of monopoly, compete.

V. Some Classical Monetary Controversies

The interpretation of classical monetary theory I am proposing clarifies a number of classical monetary controversies that have long puzzled economists. I have considered these

23. Given its monopolistic, quasi-central bank position, the Bank of England probably could keep the borrowing rate for the entire banking system temporarily below the natural rate, thereby promoting an investment boom that could continue as long as the Bank of England was prepared to lose reserves. Neo-classical theories of the business cycle, starting with Wicksell, were based on the Currency School's recognition of this possibility, which they incorrectly attributed to competitive forces.

24. In Schumpeter's words:

> First we mention one [argument] that is perfectly true so long as we confine ourselves to considering the individual banking business in a competitive system of many banks. Credit expansion for the individual bank is, in fact, severely limited by the drain on reserves that it will eventually entail. Of course, this is no longer true for all banks taken together; but even for all of them, if the system be really competitive, that penalty on stepping out of line is a more effective brake upon expansion in line than critics of banking practice are usually prepared to recognize [55, 730]

controversies elsewhere [17], so I shall only comment on a few of them here to show how they stemmed from differences between the competitive model and the quantity theory.

Smith, Hume and the Price-Specie-Flow Mechanism

Although Smith did not explicitly reject PSFM, his failure to incorporate it into the *Wealth of Nations*, after having done so in his Glasgow lectures [59, 507], has long been regarded as an unresolved mystery of classical economics [67, 87]. Various explanations have been offered for the omission of PSFM from the *Wealth of Nations* [36; 46; 9]. But the fact that in the *Wealth of Nations* Smith developed a theory of a competitive banking system under convertibility he had not worked out at the time of the Glasgow lectures dissolves the mystery. Because Smith held that a uniform international value of gold determines national price levels [58, 89, 236, 404], the changes in relative price levels crucial in PSFM could have no role in Smith's version of international adjustment. Moreover, competitive forces in the banking system ensured that the supply of money at the internationally determined price level would just equal the domestic demand for money [58, 284–5].

While it has been recognized that PSFM is inconsistent with the international determination of prices under a gold standard [10, 42] and that Smith's own recognition of the inconsistency accounts for his failure to mention PSFM [15, 615–8; 26; 32, 190–1], the role of competition in Smith's analysis has not. Since, under competition, the supply always adjusts to demand, in the event of a domestic excess supply of or demand for money, no balance-of-payments adjustment is required to restore monetary equilibrium. For Smith, PSFM was altogether redundant.

The Bullionist Controversies

In 1797 the Bank of England suspended the convertibility of its notes. Subsequently sterling depreciated against gold in the foreign exchanges. A long controversy ensued over where responsibility for the depreciation lay.

One school of thought, the Bullionists, maintained that the depreciation was the consequence of an overissue by the Bank. Others, the anti-Bullionists, either attributed the depreciation to miscellaneous factors such as poor harvests and foreign remittances owing to the war against Napoleon, or were not averse to the depreciation whatever its cause.

The importance of this controversy for our purposes lies in the subsequent misinterpretation of the orthodox classical position espoused by the Bullionists. That the Bullionists attributed the depreciation of sterling to an overissue has helped foster the impression that the quantity theory represented the classical orthodoxy. But the Bullionist controversy shows only that they accepted the quantity theory for an inconvertible currency. This is confirmed by the fact that the Bullionists held only the Bank of England responsible for the depreciation of sterling. The country banks, which maintained convertibility into Bank of England notes, could not escape the rigors of competition and were absolved by the Bullionists from any share in the blame for depreciation.[25]

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25. Typical is the following statement by Lord King [30], a prominent Bullionist.

An excessive issue of notes by any particular bank is soon detected, if not by the public, at least by the interested vigilance of his rivals; an alarm is excited; and he is immediately called upon to exchange a very large portion of his notes in circulation for that currency in which they are payable. Quoted by Viner [67, 239]

The Banking and Currency Schools

Misunderstanding of the role of convertibility and the distinction between a competitive and non-competitive banking system has muddled accounts of the next great monetary controversy of the classical period — the debate between the Banking and Currency Schools. While affinities between the Bullionists and the Banking School have been noted [39, 100; 42, 153], the Banking School has come to be identified primarily with the real bills doctrine also associated with many of the anti-Bullionists [5, 202; 42, 158]. Although members of the Banking School did, as Adam Smith had, espouse the real bills doctrine, unlike the anti-Bullionists, they believed it would prevent the overissue only of a convertible currency [14, 67].

The debate between the Banking and Currency Schools grew out of recurrent crises following the resumption of convertibility by the Bank of England in 1823. The Currency School attributed the crises to the failure, in case of an efflux of gold, of a fractional reserve currency to contract, exactly as a purely metallic currency would have. This failure prevented PSFM from operating as it was supposed to in the purely metallic case. Without the required adjustment in the money stock, the price-level disequilibrium causing the efflux would continue until the Bank of England, to maintain convertibility, was forced to contract the money stock.

This explanation of the crises led to enactment of the Bank Charter Act of 1844 which, among other things, imposed a 100 percent marginal reserve requirement on the note issue of the Bank of England to make it fluctuate *parri passu* with the movement of gold into and out of Great Britain. In addition, it imposed an absolute limit on the note issue of all other banks in the United Kingdom with a view toward their ultimate withdrawal from circulation.

The Bank Charter Act and the analysis of the Currency School on which it was founded were opposed by the Banking School. Rejecting PSFM, they followed Smith and the Bullionists in assuming that convertibility alone sufficed to ensure a uniform price level in all countries maintaining the same standard.

The Currency School maintained that if the note issue of the banking system were not subject to quantitative limit, the banks would eventually expand the domestic stock of currency beyond the public's demand to hold it. Without a limit on the amount of notes or a means of forcing a contraction in the stock of notes as gold was exported, an inevitable overissue would lead to an unchecked export of specie. The rejoinder of the Banking School was that an excess supply of money could not be issued by the banking system because of the law of reflux.

Given a domestic mechanism for equilibrating the supply of with the demand for money, the external mechanism — the balance of payments — was redundant for the Banking School as it had been for Smith. It followed that any balance-of-payments disturbance had a non-monetary cause, a poor harvest for example, that was self-limiting, or self-reversing.[26] To contract the currency in response to an efflux of gold would only ex-

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26. Fullarton made this point as follows:

If then, these bugbears of over-issue and depreciation have no real existence — if it has been demonstrated ... that the banker's power of issue is strictly limited by the public demand for notes — that the individuals composing the public, who have an equivalent in stock or credit to offer in return, can have no imaginable motive for desiring to possess themselves of a larger proportion of those notes than they absolutely require for use — that a currency not forced into circulation by authority, but limited by the demand for use, can never operate upon prices by any excess of quantity — and that it never,

acerbate the situation and perhaps lead to an internal drain once the public and the banking system sought to liquidate their assets in order to add to their cash balances.

The Banking-School position was thus a continuation of the dominant tradition in classical monetary thought. The tradition begins with Adam Smith and was continued in the work of Thornton, Ricardo, and their contemporaries.[27] The Banking-School position was, moreover, endorsed by J. S. Mill who, more explicitly than Ricardo, distinguished between the validity of the quantity theory for an inconvertible currency and its validity for a competitive convertible currency. Mill's judgment was probably shared by a majority of classical economists [55, 729].

Nevertheless, perhaps because of their success in helping to win passage of the Bank Charter Act of 1844, their association with the orthodox quantity theory, and their contribution to the development of neo-classical business-cycle theories, the Currency School has been widely represented as the dominant classical monetary position. Explicitly attacking the quantity theory (though not for an inconvertible currency), the Banking School has been widely misunderstood and incorrectly viewed as holding a heterodox position outside the dominant classical tradition.

VI. Modern Versions of Classical Monetary Theory

Modern versions of classical monetary theory have erroneously identified it with the quantity theory of money, taking for granted that the nominal money stock rather than the price level must be treated as the exogenous variable in the model. This error misled many writers, such as Viner [67] Robbins [50] Blaug [5] and O'Brien [42], who have recounted the views of the classical monetary theorists and the controversies in which they took part.[28] Even Schumpeter, who, in some respects, had a more accurate understanding than other commentators, did not fully comprehend the issues that separated the Currency and Banking Schools. He described [55, 728] their differences as "minor disagreements as

therefore, can become depreciated or suffer a diminution of its purchasing power, as compared with the currencies of neighbouring countries — and that, without such depreciation, there will be no equilibrium of value disturbed, nor any necessity for exporting the metallic portion of the circulation for the purpose of restoring it. If all this be so, it is clear, that the entire scheme of the currency party for correcting the eccentric movements of the bullion by the regulation of the issues is at an end. The ground is cut from under it [14, 130]

27. The following statement by Ricardo [49, 126-7] would have been unexceptionable to the Banking School.

The perfection of banking is to enable a country by means of paper currency (always retaining its standard value) to carry on its circulation with the least possible quantity of coin or bullion ... The amount of the circulation would be adjusted to the wants of commerce with the greatest precision, and if the Bank were for a moment so indiscreet as to overcharge the circulation, the check which the public would possess would speedily admonish them of their error. As for the country Banks, they must, as now, pay their notes when demanded in Bank of England notes. This would be sufficient security against the possibility of their being too much to augment the paper circulation

28. O'Brien [42, 158] provides an example of such misunderstanding

The Banking School position was completed by arguing not only that the balance of payments did not depend upon the price level, but also that the price level did not depend on the money supply. In this connection they reversed the normal quantity theory causality. Their argument was that the supply of money depended upon the total of money incomes to which the Banking system responded passively. But of course the total of money incomes is the total of factor service prices. All that they were doing was to explain prices by prices

What O'Brien overlooks is that the Banking School held that convertibility determines the price level, so that they were not guilty of the circularity of which he accuses them. Also see Blaug [5, 202-3] who correctly characterizes the theory of the Banking School as a "contraquantity theory."

regards analysis." The extent of the difference had, however, been clear to Wicksell, who recognized [69, 169–75] that the two schools were arguing about the validity of the quantity theory as an explanation of prices.

Aside from accounts of the practical issues with which classical monetary theory dealt, there is also an imposing literature on the pure analytics of classical theory addressing such topics as the dichotomization of the real and monetary sectors, the validity of Say's Law (Identity), the existence of a real balance effect, and the neutrality of money. Patinkin has argued [43, 162–95] that classical monetary theory invalidly dichotomized the real and monetary sectors of the economy, incorrectly assumed the validity of Say's Law (Identity) for a monetary economy, and left out real balance effects from its explanation of price-level adjustments.

Patinkin has been criticized for attributing to classical theorists positions with respect to dichotomization, Say's Law, and the real balance effect that they did not hold. Hickman [22], Baumol and Becker [4], Archibald and Lipsey [1], and Niehans [41, 9–10] contend that the dichotomy, Say's Law (Equality) and the absence of real balance effects must be understood as applying only to equilibrium states of economy and not, as Patinkin held, to disequilibrium states as well.

Such disputes can probably never be resolved because the views of classical theorists on such questions were sufficiently vague to admit of numerous interpretations. Sowell [60] has shown, for example, that a variety of propositions were subsumed by the classical theorists under the general heading of Say's Law. None of them seems to correspond precisely to Say's Law (Identity) in the sense of Lange [34] and Patinkin [43]. But many classical theorists, including Smith and Ricardo, did separate their analysis of relative-price determination from their analysis of price-level determination. They certainly believed that the factors accounting for the determination of relative prices were fundamentally different from those accounting for determination of the price level. It is the notion that a separation between the two sets of factors can be made that gives rise to the idea of a dichotomy and that suggests Say's Law. There can be no doubt that this notion was in the minds of classical writers. The Lange-Patinkin version of Say's Law is, thus, not without foundation in the classical literature and has antecedents in earlier discussions of Say's Law.[29]

What I wish to take issue with in both the Lange-Patinkin formulation of the classical model and those of their critics is the introduction of an inconvertible money into the models and their discussion of the validity of the dichotomy and Say's Law within the

29. Hayek [19, 101-2], however, seems to have had something like the Lange-Patinkin interpretation of Say's Law in mind when he wrote:

The automatic adjustment of supply and demand can only be disturbed when money is introduced into the economic system. This adjustment must be considered, according to the reasoning which is most clearly expressed in Say's *Theorie des Débouchés*, as being always present in a state of natural economy. Every explanation of the Trade Cycle which uses the methods of economic theory . . . must, therefore, start by considering the influences which emanate from the use of money.

He also seems to have had it in mind in the following [19, 107-8]:

In complete contrast to those economic changes conditioned by 'real' forces, influencing simultaneously total supply and total demand, changes in the volume of money have, so to speak, a one-sided influence which elicits no reciprocal adjustment in the economic activity of different individuals. By deflecting a single factor, without simultaneously eliciting corresponding changes in other part of the system, it dissolves its 'closedness', makes a breach in the rigid reaction mechanism of the system (which rests on the ultimate identity of supply and demand) and opens a way for tendencies leading away from the equilibrium position. As a theory of these one-sided influences, the theory of monetary economy should, therefore, be able to explain the occurrence of phenomena which would be inconceivable in the barter economy.

context of such models. Although, when addressing practical problems to which it was relevant, classical theorists did work with a model of an inconvertible currency, they regarded such a currency as exceptional from a positive standpoint and opposed it from a normative one.

Two factors account for the misrepresentation of classical monetary theory in the modern literature. One is the interest of modern writers in the dichotomy and their desire to compare the classical model with the Keynesian model in which an exogenously determined supply of inconvertible money was an explicit, and perhaps, necessary assumption.[30] For the dichotomy to be free from patent violation, one must assume that money is created costlessly; otherwise, the determination of equilibrium in the monetary sector could not fail to have repercussions in the real sector. Thus, to raise the dichotomy issue at all, one had to assume that money could be costlessly created and yet retain a positive value. No real commodity could serve as money. The other is the presumption that the classical theory of the relationship between the price level and nominal balances corresponded to some form of the quantity theory.

Since the assumption of competition in the supply of a costlessly producible asset seemed to make a positive value for that asset (or, at any rate, a determinate price level) impossible, it appeared, in the absence of a theory of a competitive money supply, necessary to compare the classical model with the Keynesian model in which an exogenously determined supply of inconvertible money was an explicit, and perhaps, assumption.[30] For the dichotomy to be free from patent violation, one must assume that money is created costlessly; otherwise, the determination of equilibrium in the monetary sector could not fail to have repercussions in the real sector. Thus, to raise the dichotomy issue at all, one had to assume that money could be costlessly created and yet retain a positive value. No real commodity could serve as money. The other is the presumption that the classical theory of the relationship between the price level and nominal balances corresponded to some form of the quantity theory.

Since the assumption of competition in the supply of a costlessly producible asset seemed to make a positive value for that asset (or at any rate a determinate price level) impossible, it appeared, in the absence of a theory of a competitive money supply, necessary to assume that the nominal stock of the asset be exogenously, rather than endogenously, determined.[31] Neither, it must have appeared, would convertibility into some real asset at an exogenously determined conversion rate have solved the problem. Convertibility would have, *ipso facto*, destroyed the dichotomy by introducing monetary effects into the real sector because of the necessity of holding reserves of the asset into which money would be convertible.[32] And since the price level was presumed to be determined by the quantity theory under a convertible as well as an inconvertible currency, the assumption of convertibility would not have altered fundamentally the model used to represent classical theory.

But, as we have seen, an endogenously determined supply of costlessly produced money can be reconciled with a finite price level under convertibility. Costless production under competitive conditions does not imply an infinite price level because competition

30. See Rueff [52]. Also see Shackle [57, 212–3], who draws attention to the fact that in the *Treatise* [28] Keynes had assumed that the money stock was endogenous while in the *General Theory* [29] he assumed that it was exogenously determined, and Hicks [24, 75–7], who contrasts the exogeneity of the money stock in the Keynesian model with endogeneity of the money stock in the classical and Wicksellian models.

31. See footnotes 2–5 above.

32. See Niehans [41, 9] who argues that convertibility is inconsistent with neutrality as well as a dichotomy.

itself compels the banks to maintain convertibility as well as to pay real interest on the cash balances they produce. Nor would convertibility undermine the dichotomy between the real and the monetary sectors because, if banks can produce cash balances costlessly, they would incur no costs of holding reserves. If they incur no costs of holding reserves, then either 1) they are not holding any reserves because the confidence in the money produced by the banks is such that the commitment they make to convert suffices to maintain the value of the money they produce and eliminates any demand for the real asset as a medium of exchange, or 2) the banks forego no interest on the reserves they hold because the reserve asset is, itself, appreciating at a rate equal to the rate of interest. An asset appreciating at a rate equal to the rate of interest cannot be providing any current real services. If it provides no current real services, then the holding of it by banks as a reserve does not withdraw it from any current use. Its value in the present is unaffected by its use in the monetary sector, so the dichotomy is not breached.

An exogenously determined stock of a costlessly produced inconvertible paper money is, thus, not essential to a model in which the classical assertions about Say's Identity and a dichotomy between the real and monetary sectors could be derived.[33] Indeed, the assertion of the Banking School that a convertible currency could never be redundant, the law of reflux, is precisely what is asserted by Say's Identity. The Banking School also recognized that this redundancy was possible in the case of a metallic or inconvertible currency.[34] Unlike inconvertible or metallic money, convertible bank money is not a "hot potato" that has to be held by someone. The public does not have to hold a larger amount of convertible bank money than it chooses to.[35] As required by Say's Identity, an excess supply of bank money has no impact on real markets, but instead leads to an exchange of assets between the public and the banks that eliminates the excess supply.[36]

33. Although Patinkin [43, 295–310] does consider the properties of a pure inside money and a "laissez-faire banking system" and even finds that a valid dichotomy for such a system is possible, as Modigliani [40, 183–4] had shown earlier, he never considers the possibility that classical monetary theory had anything to do with such a system despite a passing reference [43, 309] to the real bills doctrine.

34. Fullarton's words were:

That soon after the discovery of the South American mines in the sixteenth century, a decline in the value of the precious metals was manifested all over the world by an universal rise of the money prices of commodities, is a fact which no one presumes to question. It is equally undenied and undeniable, that the inconvertible paper money issued by sovereign states may be, and in many instances has been, degraded by excess of quantity, until its value in exchange has been nearly extinguished altogether [14, 57–8]

35. Again consider what Fullarton wrote:

Still more decidedly have the conventional issues of governments all the characteristics of a forced currency.... [E]ven after the notes have become depreciated, the law compels the private creditor to accept them in satisfaction of his claim; and the government having no better money to offer, the only alternative left to its creditors and dependents is to take this or none. Bank-notes, on the other hand, are never issued but on the demand of the recipient parties. New gold coin and new conventional notes are introduced into the market by being made the medium of payments. Bank-notes, on the contrary are never issued but on loan, and an equal amount of notes must be returned whenever the loan becomes due. Bank-notes never, therefore, can clog the market by their redundance, nor afford a motive to anyone to pay them away at a reduced value in order to get rid of them [14, 64]

Compare Fullarton's statement to the following quote from Tobin [65, 229]:

Once created printing press money cannot be extinguished ... The community cannot get rid of this currency supply; the economy must adjust until it is willingly absorbed. The 'hot potato' analogy truly applies. For bank-created money, however, there is an economic mechanism of extinction as well as creation, contraction as well as expansion. If bank deposits are excessive relative to public preferences, they will tend to decline ... The burden of adaptation is not placed entirely on the rest of the economy.

36. This point, too, was clearly expressed by Fullarton:

However prone individuals may be to abuse at times the facility of borrowing, no merchant can ever desire to keep by him a larger sum in bank-notes than is indispensably necessary for his payments; and if any one were disposed to indulge in so

VII. Conclusion

I have been arguing that the modern approach to monetary analysis which aggregates the liabilities created by the banking system with currency created by the government into a single measure of the money stock supposedly under the control of the domestic monetary authority has distorted our view of classical monetary theory. The aggregation of bank liabilities with the gold stock to determine the total money stock and then the application of the quantity theory to this aggregate is a misleading version of the classical model. The classical money model viewed bank liabilities as the output of a competitive industry that operated under the same sorts of constraints and was influenced by the same kinds of incentives as other industries. The supply of bank liabilities was, like the output of any other industry, determined by the cost and demand conditions relevant to the industry.

It was in this sense, I believe, that classical economists who spoke about the impossibility of overissue of banknotes were correct. At any time there will be some profit-maximizing output for a competitive industry. If the output deviates, in either direction, from the industry's equilibrium output, economic forces automatically tend to bring back the output of the industry to its equilibrium level. Because of the distinction between nominal and real values for monetary units, a distinction not relevant for other industries, convertibility was necessary to provide an anchor that would prevent changes in nominal units from changing the price level.

Nor have the effects of the modern money-supply paradigm been limited to causing a misunderstanding of classical monetary theory. Instead of seeking to apply more consistently the basic framework of economic analysis to a theory of the output of the banking industry, economists have been content to adopt a special theory of the money supply that, at best, was only indirectly influenced by the profit-maximization paradigm of standard neo-classical marginal analysis.[**] Thus, nearly 50 years after Hicks's classic article [23] calling for the consistent application of the marginal utility theory to the demand for money, economists have only just begun to apply the marginalist theory of the firm and the industry to the supply of money. Though hardly marginalists, the classical theorists at least tried to apply the same theory of supply in monetary analysis that they used for other purposes. In this respect, I would argue, the classical theorists showed greater insight than those who have come after them.

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unprofitable a fancy, it would be a matter of not the slightest importance to any other than himself, for in as far as the public are concerned, notes which are not in use are the same as if they are not in existence. Those notes cannot be obtained from a banker, but by paying interest for the use of them, nor can they be obtained at all but for very short periods, at the expiration of which they must be replaced. Their circulation must always be strictly limited by the wants of those who have value or security to offer for them. And so limited, there can be no redundance, no holder of them can ever be placed in the same predicament with the importers of a double supply of bullion, or the recipients of a forced issue of government-paper, who have no means of turning their acquisitions to use by submitting to part with them at a reduced value [14, 64-5]

37. I have argued elsewhere [16] that the standard money-multiplier model involves a confusion of demand and supply concepts that makes it inconsistent with conventional supply-demand analysis as well.

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The Bullionist Controversy Revisited

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

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

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