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The Evolutionary versus Revolutionary Views

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Endogenous Money:
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by
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Introduction

Economists interested in contemporary monetary theory are largely confronted with two diametrically-opposed views, which, following Schumpeter (1954/1994, p. 277), we may label as real and monetary analysis respectively (see Rogers, 1989, Ch. 1). According to the first view, largely associated with neoclassical or mainstream economists, money is merely a veil behind which the real economy operates, unhampered by monetary factors. For these economists, money plays no role except in determining nominal magnitudes. This means that the real and the monetary sides of the economy are independent of each other, notably in the long run, although in the short run money may play a role, but partisans of real analysis usually consider this role as the result of some market frictions or imperfections.

By contrast, according to proponents of monetary analysis, which include notably post-Keynesians, but also supporters of the monetary circuit approach, as well as a number of Sraffians, institutionalists, and Marxian scholars, the existence of money is paramount in economic analysis. As a matter of fact, it is impossible to study economics, particularly macroeconomics, without first understanding the conception of money, its logical origin and creation, and how money is linked to production and income (see Cencini, 2001). Now, for this second group of economists, the supply of money is endogenous, because it is determined by the agents' demand for a means of payment, in production as well as in exchange.

Among monetary analysts, post-Keynesian economists have made endogenous money the cornerstone of their monetary theory of production. While there is now a large consensus on its meaning (see for instance Lavoie, 1996),[1] there is also a need to go beyond it and to look back, to the distant past in fact, into the origins of endogenous money. We believe that by doing so, we can engage endogenous-money proponents into a much needed and potentially very fruitful debate on not only the origins of endogenous money but also on its essential meaning.

The purpose of this paper is therefore to shed further light on the endogenous *nature* of money. Contrary to the established post-Keynesian perspective – what we call here the evolutionary view – we argue that money has always been endogenous, irrespective of the historical period. This discussion may be important for both theoretical and policy reasons, a point that we address later in the paper. Overall, however, showing that money has always been endogenous is important in particular for post-Keynesians, since it will help to put the role of central banks and other monetary institutions, as well as financial innovations, in their proper theoretical perspective. This implies, in particular, that money is endogenous irrespective of the central bank, the specific stage of development of the banking sector, financial innovations, or other recent institutional changes, a point that has already been made forcefully by Lavoie on numerous occasions (see in particular Lavoie, 1992, p. 186, and Lavoie, 1996). These issues are taken up later in this paper.

The structure of the paper is as follows. The next section briefly overviews the essential elements of endogenous money theory as it now stands. The third section discusses the so-called evolutionary view of endogenous money, as argued by Chick's (1986) theory of the evolution of the banking system. In its stead, we propose in the fourth section what might be called a "revolutionary"[2] definition of endogenous money consistent with many aspects of post-Keynesian economics as well as with the monetary circuit approach, where money is always and everywhere an endogenous phenomenon, irrespective of the historical period, and therefore even under the gold-standard system. This alternative, analytical view rests on the nature of debt, the role of settlement institutions, and the functional link between production, money, and income. Indeed, the historical evolution of the banking system has simply been revealing and making it plain what has always been the case in actual facts, to wit, the endogenous nature of money. The fifth section concludes.

Before we proceed, let us specify that to do justice to the ideas presented in this paper, we would need more space to develop them more comprehensively on historical grounds, and to extensively articulate the arguments behind them. Despite the space constraints imposed herein, however, we believe that we develop these ideas to a sufficient extent, in order to start off a promising discussion among endogenous-money proponents so as to strengthen monetary analysis on theoretical grounds. In fact, the ideas that we challenge here are crucial for endogenous money theory and policy, and

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we believe that in this paper we provide the theoretical foundations for a much needed debate that should clarify, and hopefully enlighten, the heterodox meaning of endogenous money. We hope that other heterodox monetary economists will take up this challenge and provide further evidence on the historical roots of endogenous money in a not too distant future. As a matter of fact, our work is not a historical paper, in the sense that it does not deal with the history of money and monetary facts. Rather, it is a theoretical paper dealing with monetary analysis. In doing so, however, it provides some historical examples to illustrate and to buttress our arguments.

Endogenous money: a quick overview

Endogenous money is at the centre of post-Keynesian macroeconomics.[3] It is a tradition that began in the post-Keynes era with Joan Robinson (1956) and continued with Kaldor (1970) and then Moore (1979a, 1979b, 1983, 1988). Today, it is elaborated and deeply embedded in post-Keynesian economics, and stands as a rallying point of departure from many mainstream approaches.[4] According to post-Keynesian scholars, money appears in the economy along with production when banks agree to honour debt contracts with firms (Davidson, 1972). As the economy grows, banks increase their loans to meet the growing needs of the system, either to pay out wages or to remunerate any factors of production.[5] In this view, as soon as a firm obtains a bank loan, it can remunerate its wage earners: at this very instant money is created by the bank carrying out the payment. The creation of money is thus parallel to, but must not be confused with, the creation of income. As is argued by Joan Robinson (1956) and by post-Keynesians in general, the supply of money expands and contracts with the needs of production, in response to expectations of aggregate demand, through the banking system (see Arestis and Eichner, 1988).[6] Even in a stationary system there is always a need for new bank loans, as firms must reimburse the banks for the loans obtained to finance past production. If so, then at the beginning of each production period a new credit line must be obtained by firms, and banks must agree to grant this new loan or to roll over existing debt (see Parguez and Seccareccia, 2000). Of course, banks may always refuse to grant new lines of credit, in light of bad profit expectations or bad expectations on the future course of the business cycle. Hence, banks are never passive in their lending decisions, and there may always be a "fringe of unsatisfied customers" (as Keynes put it). When banks refuse to grant loans, this can lead to a downturn in the business cycle, which can give rise to higher unemployment rates, although the principal causes of unemployment may be structural rather than behavioural (see Cencini, 1996). As long as firms are deemed creditworthy, however, they will receive the necessary lines of credit. Similarly, as banks are deemed creditworthy, they should face virtually no limit to the amount of loans they can grant as long as they "move in step", as Keynes (1930/1971, p. 23) pointed out.[7]

If this view is correct, then what about ancient monies? Can the same logic be applied to them? For instance, was money already endogenous in 750 B.C. when the people in Lydia (Asia Minor) were inventing the first coins,[8] or in 400 B.C. when the Mesopotamians and Egyptians were instituting earlier forms of banking? In other words, was money already endogenous in ancient times, or did it become endogenous over time, as Victoria Chick (1986) and many other post-Keynesians argue, in particular with respect to the creation of central banks?[9]

The evolutionary view: a critical appraisal

In a widely-quoted paper, Chick (1986, p. 113) argues that, in the early stages of banking, money was entirely exogenous. Banks were neoclassical, in the sense that they were "'conduits' between saving and the employment of those savings for investment […] saving determines the volume of investment". At that time, according to Chick, the causality ran from bank deposits to reserves, and finally to loans. The supply of bank loans was therefore pre-determined, and the scarcity principle applied. Banks were mere financial intermediaries. This was the first stage of financial development.[10]

Stage two, in Chick's (1986, p. 114) view, is when the "'bank deposit multiplier' is the relevant theory: the banking system can now lend to a multiple of reserves, subject to a conventional or imposed reserve requirement". It is only when the central bank has "fully accepted responsibility for the stability of the financial system" (Chick, 1986, p. 115), in the fourth stage of banking development, that banks were able to expand lending beyond their reserve capacity. It would then be the accommodative role of the central bank, that is, the removal of reserve constraints, which rendered money endogenous, in the loans-make-deposits causality sense. Endogenous money is thus viewed as the result of institutional changes, defined as the ability of the banking system to expand the supply of loans with no prior expansion of bank reserves. Stage five, the introduction of liability management, is considered a less fundamental version of money's endogeneity, when banks actively seek to pursue financial innovations in order for them to expand the supply of loans. This last stage arose only because the central bank may not fully accommodate the demand for bank reserves. In both these stages, however, the result is essentially the same: banks no longer depend on deposits or reserves to lend.

The main conclusion in this analysis is that money is endogenous or exogenous according to the historical period considered. This argument has been advocated by a number of post-Keynesians. Minsky (1991, p. 208), for instance,

claimed that "there are periods in history and economic conditions where the money supply was mainly endogenous and other periods and conditions where the money supply was largely exogenous" (see also Davidson, 1972; Davidson and Weintraub, 1973; Dow, 1988; Guttmann, 1990, p. 820; Niggle, 1991). Moore (1996, p. 89) notably claims that the exogenous/endogenous debate is somewhat misleading, since "both views are correct, but […] each is applicable to a *different* historical period". Even Eichner (1987, p. 849) seemed to hold such views: "The reason the earlier systems of commodity and fiat money alone were replaced by a credit-based system was the need for a means of payment that would vary with the level of economic activity and thus with the need for additional funds."

It is this very position that we wish to challenge, that is, the notion that money was at one point in our history an exogenous variable controlled by monetary authorities, and that, through time, owing to the development of banking and to financial innovation, somehow money became out of reach for monetary authorities. As recently pointed out by Arestis and Howells (2002, p. 4) in fact, in a paper referring to the "great inflation" in the United Kingdom between 1520 and 1640, endogenous money might have already existed in the distant past: "[t]here appears to have been some scope for [money's] endogeneity, even in the very earliest 'stages of banking'". As a matter of fact, as noticed by the authors (p. 9), at the time money was reified into a precious metal, only a fraction of the metal available, in the sense of having being mined and melted, was used as a circulating medium. According to Innes (1913, p. 389), "[i]ndeed so small was the quantity of coins, that they did not even suffice for the needs of the Royal household and estates which regularly used tokens of various kinds for the purpose of making small payments. So unimportant indeed was the coinage that sometimes Kings did not hesitate to call it all in for re-minting and re-issue and still commerce went on just the same." Courbis et al. (1991, p. 321) add another relevant point in this respect, namely, that trade between distant cities did not occur using gold (coins), that is, a commodity, to represent money, owing to distance, geography, and the intensity of exchanges.[11] This might imply that several transactions were carried out using, say, goldsmiths' debt certificates, that is, fiat money. In addition, because of foreign trade, gold inflows did not arrive like helicopter money within the country: "If a country runs a balance of payment surplus, it must expect (in the sixteenth and seventeenth century) to receive the surplus in specie" (Arestis and Howells, 2002, p. 9). As a consequence, if the endogeneity of money means that the money supply is demand-driven, "even commodity money can provide an example of monetary base endogeneity, increasing in response to trade demands" (p. 9). Money would thus be endogenous independently of its material form.

To explain money's endogeneity, in fact, we can reduce our analysis of the economy to essentially three crucial relationships: (i) the relation between banks, firms and workers, (ii) the relation between banks and the central bank, and (iii) the relation between banks and households. Notice that banks appear in all three relations. The first relation explains the endogenous nature of bank money as firms ask for and receive bank loans; the second emphasises the endogenous nature of interbank settlement balances as the central bank supplies reserves or acts as a clearing institution finalising all debts within the banking system; while the third describes the endogenous nature of bank deposits as households – via their portfolio decisions – demand money balances. While these three relationships are crucial to explain the creation, circulation, and destruction of money, only the relation between banks, firms and wage earners is needed to explain the creation of money. It can be argued, therefore, that the relation between banks, firms and wage earners, on the one hand, and the relationship between banks and the central bank, on the other hand, address two different aspects of the theory of money and interest – they are flip sides of the same coin, as it were.[12] The first aspect concerns the endogeneity of money, while the second addresses the setting of interest rates (an issue that we do not address here).

A possible explanation of the post-Keynesian adherence to the evolutionary view may rest in the fact that most post-Keynesian authors have traditionally emphasised the second relationship, namely, that between banks and the central bank, with less emphasis placed on the other two relationships. Indeed, many post-Keynesians identify the endogenous nature of money with central banking, as is depicted for instance by Chick (1986). For example, Rousseas (1989, p. 478) summarises this position clearly: "The degree to which the supply of money is positively sloped depends on the discretionary policies of the Federal Reserve." This is, in our view, a sad misconception of the endogenous nature of money.[13]

Now, for some post-Keynesians credit and money can never be constrained (see Lavoie, 1992) – except perhaps by the demand for them. This point was indeed well recognised by Joan Robinson (1956). As her views on endogenous money are becoming increasingly considered (see Graziani, 1989, Lavoie, 1999, Rochon, 2001, Gnos and Rochon, 2003), we now find evidence that she also was of the opinion that money was endogenous even under the gold-standard system. As a matter of fact, if there were some physical limits imposed by gold mining, banks simply would step in and create the necessary amount of money in order to meet the needs of the economy: hence, even under the gold standard, the money supply adapted to its demand.[14] As Robinson (1956, p. 32) put it, "[g]eology being limited, the stock above ground did not grow nearly as fast as the demand for liquid balances, and banks came into existence to supplement the supply."[15]

The above statement by Joan Robinson leads us to two immediate conclusions. On the one hand, as stated above, money is endogenous irrespective of the historical period, and hence even during the gold-standard era (see below). In other words, the endogeneity of money is not linked to any specific institution, and pre-dates the creation of banks or

their development.[16] On the other hand, there would have been no "stages of development" of the banking system *essentially*. Banks would have been created for the sole purpose of providing book-entry money to meet the growing demand for it.

In fact, the first, decisive step in the institution of banking was the introduction of double-entry bookkeeping. Made possible by the discovery of negative numbers (attributed to the Indian mathematician Brahmagupta in the seventh century), double-entry bookkeeping was developed only much later – in the thirteenth century – by Italian traders, who took advantage both of Arabic numerals and of the Indian conception of zero. It is indeed to Indian mathematicians that we owe the knowledge that zero has a definite numerical value of its own, that it is an even number (the integer that precedes one), and that it separates positive from negative numbers. Italian merchants were the first to realise that positive and negative numbers could be used to represent commercial transactions as well as to allow for the activity of newly-born institutions that became the ancestors of today's banks (Cencini, 2005, p. 299).

As Courbis et al. (1991, p. 332) point out, in fact, the account balance written on paper or merely recorded in the books of the "banks" continued to be managed by merchants and was the result of lending activities. Hence, loans created deposits, which is tantamount to saying that the supply of money expanded with the demand for it. Further, Courbis et al. (1991, pp. 323–5) provide strong arguments according to which paper was discovered very early in history but only became a money form much later on: paper had been for a long time the material used by human beings in order to keep accounting books in what were called at that time "*banche di scritta*" (that is, accounting banks) in fourteenth-century Venice.

> In Venice everyone "of consequence in business had an account so that he could make and receive payments through the banks. They were called *banche di scritta* or *del giro* because their main function was to write transfers and thus to rotate (*girare*) credits from one account to another." It is clear that these deposits on current accounts were a form of bank deposit money. (Copeland, 1981, p. 252; citation from Lane, 1973, p. 147)

This book-entry payment system was developed during the fourteenth century, probably in Genoa and Florence (Copeland, 1981, p. 254, fn. 6). As Rostovtzeff (1941, pp. 404–6) claims, however, this system might have been used already in ancient Egypt about 300 or 200 B.C.: a second-century papyrus record (Teb 891.36) contains fragments of the daily payments recorded by a small branch bank in the Heracleopolitan province. "In many instances […] the payments were effected by transfer from one account to another without money passing." The same system was also in use in Greece at least by the fourth century B.C. (Copeland, 1981, p. 249): when a debtor settled his/her debt obligation, his/her deposit account in the bank was debited and the creditor's account was credited. According to Courbis et al., however, the double-entry bookkeeping system of banking reached its historical apex at the beginning of the seventeenth century with the Bank of Amsterdam. As they observe, "at that period, money is not made of paper; it is rather already book-entry money" (Courbis et al., 1991, p. 325, our translation; see also Ingham, 2004, for a detailed historical account). If this view is correct, then this interpretation may strengthen the post-Keynesian theory of endogenous money by providing a firmer, and more heterodox, ground on which to build a general theory of a monetary economy of production. Let us elaborate on this point.

The revolutionary view: some first principles

Money and debt

As the theory of the monetary circuit shows, although this is also a conclusion reached by post-Keynesians, money is a necessary result of a debt relationship between a borrower and a lender (see Graziani, 2003, but also Hicks, 1967, p. 11). In this sense, money is a social relation (see Ingham, 1996). To place a value on the debt, a value system needs to be developed by society. In this respect, money is a social, numerical counter supplied by the banking system just as it is required, as was stated by Hicks (quoted by Laidler and Parkin, 1975, p. 742). This then means that any transaction, and a fortiori any payment, necessitates a bookkeeping system to record debt obligations and their final settlement. In bookkeeping terms, the creation of money is the means by which the banking system provides the economy with a number of money units that are debited and credited to the payer, respectively to the payee, who use them to exchange objects between them.[17] This number of money units is necessarily created by banks, or by their predecessors (say, goldsmiths). This creation may of course take different physical forms depending on the technological and institutional framework, but is always an endogenous phenomenon, because it stems from the agents' demand for a (final) means of payment – be it in the form of gold coins, paper money, or purely book-entry money. As Ingham (1996, p. 510) argues, "all forms of money *are* social relations", "including its archaic 'commodity' forms" (p. 525).[18]

To be sure, it is beyond dispute that important changes have occurred in the material form taken on by money or in the way debt obligations are physically settled. However, unless we make the error of identifying money with what has been historically used to represent it, the changes in the material form of money cannot be taken as a proof of the

evolution of its nature. Even if we accept the view that our economic systems are part of a "process of interdependent evolutionary change, a process which itself evolves" (Chick and Dow, 2001, p. 712), this does not imply that in an open, evolving, and complex system as the actual economy, money itself is evolving in *nature* (that is to say, conceptually), as Chick and Dow (2001, p. 710) maintain. In this context, the evolutionary argument made by Chick and Dow (2001) would not stand for a change in the meaning of concepts, but for an increasing degree of conformity between the working of the economic system and the endogenous nature of money. More precisely, a positive evolution can occur only if the practical structure of the (monetary) economic system is made to comply with the set of macroeconomic laws implicit in the bookkeeping nature of money and its relation with production and exchange (Cencini, 2005, pp. 280–1).

This conclusion can further be substantiated on historical grounds. Recall that in Middle Ages, particularly at the beginning of the fourteenth century, great periodical fairs were being held in all Europe, the most famous of them in Champagne, France, to which came traders and bankers from everywhere. In order to settle transactions, "[e]xchange booths were established and debts and credits were cleared to enormous amounts without the use of a single coin" (Innes, 1913, p. 396). This is so much so that "[a]t some fairs no other business was done except the settlement of debts and credits" (p. 397). Such an institution, as a matter of fact, enabled merchants and traders to rely on a unit of account whose definition is stable, because of its being wholly independent of coin debasement – a practice that was not infrequent at that time. Clearly, these primitive forms of clearing houses defined a monetary space (Ingham, 2002), whose borders were set by the limits within which debts and credits were an endogenous phenomenon with respect to a given medieval fair.[19]

In fact, according to many historians, anthropologists, and sociologists (see Polanyi, 1944, Grierson, 1977, and Ingham, 2000, among several others), money originated in primitive societies as a unit of account and means of payment. As a matter of fact, even in ancient, stateless societies, human relations implied a unit of account to measure and regulate the reciprocity of debt obligations as well as the redistribution of commodities. These human or social relations also implied a means of payment in order for individuals to settle their social debts, such as those arising from status, kinship, convention, or religion (see for instance Malinowski, 1921, Einzig, 1949/1966, and Polanyi, 1977). In primitive societies, therefore, money did not appear as a market-induced result of a discovery process that cost minimising agents went through in order for them to avoid the drawbacks of the double coincidence of wants. Money was (and indeed is) based "on the antiquity of the law of debt" (Innes, 1913, p. 391). Indeed, what Innes (1913, p. 393) called "the primitive law of commerce" is the basic principle of double-entry bookkeeping, which is to record debts and credits for further reference and settlement. From a technological point of view, this is tantamount to saying that "money is equivalent to a primitive form of memory" (Kocherlakota, 1998, p. 232). In other words, exchange as well as production require a numerical system by which the value of these actions or transactions can be accounted. As Ingham (1996, p. 519) puts it, "money as a measure of value is a 'collective representation' for which the analogue is the structure of society."[20]

Now, debt–credit relationships, and records, have neither logically nor historically to do with a particular material support, say gold. In other words, money's value has no link with the stuff that carries out money's function in both ancient and modern societies. This is a "first principle" valid in any historical period, even the gold-standard era. To be sure, gold coins were just one possible *form* of money. They were largely used as a means of payment owing to the fact that the State had often a monopoly on the mints, and that with its *imprimatur* the State provided a universal guarantee against counterfeiting. However, the value of a coin under the gold standard was not driven by its metal content, weight, or backing. As Innes (1913, p. 382) pointed out more than ninety years ago, under the gold standard "the monetary standard was a thing entirely apart from the weight of the coins or the material of which they were composed. These varied constantly, while the money unit remained the same for centuries." In fact, the value of a gold coin, as the value of any other form of money, stems from the association of money with production activities, an association in which the monetary theory of production is firmly grounded (see Schmitt, 1960, 1972, 1975, 1984, Cencini, 1988, 1995, 2001, Graziani, 2003, Ch. 3, Rochon and Vernengo, 2003, and Rossi, 2003).

Money and production

In a monetary economy of production, "[m]oney is introduced into the economy through the productive activities of the firms, as these activities generate income. There can be no money without production" (Lavoie, 1984b, p. 774). Let us focus therefore on the factor market and particularly on the payment of factor costs for produced output. This is indeed one of the fundamental building blocks of any monetary theory of production.

Consider a simple, stylised economy, in which a single bank operates. This, incidentally, may have some historical relevance with respect to ancient societies and moreover shows that the central bank (or its accommodative role) is not necessary in order for money to be endogenous. Let us refer to a numerical example, in which one primitive bank (say, a goldsmith) intervenes to "monetise" the economy's output. In any transaction where this bank intervenes, in fact, the

latter issues the monetary form of the payment between two agents, a payer, A, and a payee, B, say in the form of (goldsmith's) debt certificates. If so, then the goldsmith's ledger will record the transaction as depicted in Table 1.

Table 1. The result of a payment in the goldsmith's ledger

Goldsmith (a primitive bank)			
Assets			Liabilities
Agent A (payer)	+ x $	Agent B (payee)	+ x $

As clearly shown by circuit theory any transaction involves three parties, namely a payer, a payee, and a record keeper, that is, a "banker" (as argued also by Hicks, 1967, p. 11, and Parguez and Seccareccia, 2000, p. 101). To be sure, if the payment were a "dyadic" exchange, that is, a bipolar operation between the contracting parties, in which the payer handed over to the payee an acknowledgement of debt that the payer himself fabricates (say, a wooden tally), then the payment would not be final but merely promised. In fact, as argued by Graziani (2003, p. 60), "[i]f a simple promise of payment could perform the role of final payment, buyers would be endowed with a seigniorage privilege, namely with a right of withdrawing goods from the market without giving anything in exchange". As everybody knows by personal experience, nobody can finally pay by surrendering a promise to pay.

On the factor market, the payment of the "productive services" involves thus three poles, that is, a firm (agent A), a worker (agent B), and a bank. The same holds for the product market, since any transaction on produced goods and services requires a seller (usually a firm), a purchaser (a household), and a bank as a "record keeper" and go-between. In this regard, let us point out that gold or paper money, even in its earlier form of a goldsmith's certificate, is just the material representation of a bank deposit, and that the transmission of bank notes or goldsmiths' certificates between agents means, in fact, a transfer of the corresponding drawing right (that is, a financial claim) over produced output, as recorded by a bank. Every bank note corresponds as a matter of fact to a double-entry in the books of the issuing bank, a record of which the note is the material representation circulating outside the bank issuing it. As Innes (1913, p. 407) cogently pointed out in this respect, "[a] bank note differs in no essential way from an entry in the deposit register of a bank. Just like such an entry, it is an acknowledgment of the banker's indebtedness […]. The only difference between a deposit entry and a bank note is that the one is written in a book and the other is on a loose leaf; the one is an acknowledgment standing in the name of the depositor, the other in the name of 'the bearer.'" This is a point that Courbis et al. (1991, p. 329) very clearly illustrate referring to British monetary history, particularly at the time of the first goldsmiths in London, around 1660–65. The authors (pp. 324–5) are also clear in noting that book-entry payments existed long before bank notes or their ancestors, say a goldsmith's certificates, appeared on earth.[21] Indeed, "[t]here is little doubt that money had existed for at least 3000 years before coins were struck, taking a wide variety of forms" (Wray, 2004, p. 235). All these forms have a social underpinning, in the sense that they require a (social) relation between a debtor and a creditor.

Now, in order to explain the purchasing power of a goldsmith's certificates, or of a gold coin, we have to consider production and not merely exchange of already produced goods and services. So, in the stylised example of Table 1, we notice that agent B, namely, the worker, is credited with a sum (of x units) of money, as written on the goldsmith's ledger and represented by the latter certificates, for the labour services this agent provides for what in modern parlance we dub a firm, that is, agent A. As a result, the nature of any form of commodity money, here in the form of paper (the goldsmith's certificates), is that of a means of payment, which of course can be stamped onto gold or printed onto paper, but which is neither gold nor paper, nor *anything* else. As such, commodity money (that is, the *means* of payment) has to be distinguished from the *object* of this payment, which is in fact the result of labour, that is, the worker's effort that gives rise to a net output for the economy as a whole. Indeed, the number of money units resulting from the payment of production costs, namely, the remuneration of the worker's effort, is the monetary form of a social product that is net for the whole economy and that defines money's purchasing power (see Schmitt, 1960). In a sense, the goldsmith's certificates are worth x money units since they have been issued in the payment of factor costs for that very amount.

However, this is not the end of the story. In fact, if we push the analysis further, we can notice that, like bank money, even commodity money is not a commodity. In the contrary case, we would have to add the value of commodity money (say in the form of gold coins that the above goldsmith would have handed out to any agent claiming to obtain them in exchange for the goldsmith's certificates) to the value of produced output, thus measuring the value of this economy's income twice – a mistake that Smith urged us not to do.[22] As a further elaboration, the rejection of the idea that commodity money is a commodity can be useful to explain the life-long, and well-known, Ricardo problem of finding a physical invariable standard of value among the set of commodities (gold, for instance).[23] In short, as the

social form of value, money, and even commodity money, must never be confused with a commodity, such as gold, paper, or any other physical item. Otherwise, we would be led to search for an invariable standard of value among the commodity set, a problem that indeed has no solution, as Ricardo's enduring attempt shows us forcefully.

At the time of commodity money, therefore, money was already endogenous on account of the intrinsic need for the economic system, although primitive, to express output in a social form, that is, in a form allowing for its (homogeneous) measure and exchange. To wit, commodity money is not a commodity, but a homogeneous unit of account since it is a dimensionless standard, an incorporeal means of payment that in itself has no value and as such has not to be measured. As Innes (1914, p. 159) noted, "the dollar is a measure of the value of all commodities, but is not itself a commodity, nor can it be embodied in any commodity. It is intangible, immaterial, abstract." Referring to the above example as depicted in Table 1, we notice that the bank's double entry (in the goldsmith's ledger) is precisely the numerical measure of the transaction between non-bank agents A and B, because the number of (x) money units issued by the bank, or the goldsmith, measures the value of the object exchanged between A and B.

> There is thus a constant circulation of debts and credits through the medium of the banker who brings them together and clears them as the debts fall due. This is the whole science of banking as it was three thousands years before Christ, and as it is to-day. It is a common error among economic writers to suppose that a bank was originally a place of safe deposit for gold and silver, which the owner could take out as he required it. The idea is wholly erroneous and can be shown to be so from the study of the ancient banks. (Innes, 1913, p. 403)[24]

Needless to say, if the payment between A and B were carried out with a number of gold coins, instead of via the payment services provided by a bank or a goldsmith, the analysis would not change as far as the endogenous nature of money is concerned. To be sure, as noted already, the emission of gold coins had been recorded by its point of origin, namely a bank or a goldsmith, in the form of a double-entry in the issuer's books. So, when these coins are returned to their issuer, as a deposit or in repayment of a loan, their last owner is entered on the liabilities side of the T-account kept by the issuer. Again, the law of reflux shows that there can be no excess supply of commodity money, since even this primitive form of money is credit-driven and demand-determined.

To sum up, money is and has always been an endogenous phenomenon owing to its being essentially tied to the nature of debt and the need for a final means of payment that has to be provided by a third party on the agents' demand. Money and payments are indeed two sides of the same coin, as it were. Since any payment is elicited by the "needs of trade", it follows that money is always and everywhere endogenous – even if a central bank is non-existent or non-accommodating with respect to the banks' demand for reserves.[25]

Conclusion

This paper has shown that money is endogenous irrespective of its material or immaterial form. The historical evolution of the banking system has been revealing and making it plain what has always been the case in actual facts: the supply of money is demand-driven and is integrated in the real world through production, as this activity needs to be financed (as Keynes's "finance motive" pointed out) before produced output can be sold on the goods market. The evolution of banking systems provides the basis for a better understanding of Keynes's monetary theory of production. Yet, it is by understanding also the endogenous nature of commodity money that we might be able to provide some further advances in post-Keynesian monetary economics. In our view, it is indeed through a general theory of endogenous money that it will be possible to put to the fore a monetary macroeconomic analysis encompassing that of Keynes, both of the *Treatise* and the *General Theory*. The arguments made in this paper strengthen post-Keynesian monetary economics, in order to make it historically consistent, and to put it in a better position to represent a convincing alternative to traditional monetary analyses.

The position argued here is that there can never be an excess supply of money (Kaldor, 1982).[26] Even in the early stages of banking (Chick, 1986), money had been endogenous: neither the absence of a central bank, nor its unwillingness to accommodate the banks' demand for central bank money (settlement balances) can be considered as evidence of money's (partial) exogeneity. In fact, a central bank's accommodation is instrumental in avoiding interest rate hikes that a non-accommodating behaviour would lead to in the interbank market. Behaviour, however, cannot affect an ontological principle: the nature of money is a social relationship that results from "the law of debt" (Innes, 1913), the material scaffold of the book-entry record being of no fundamental relevance at all for a conceptual analysis.

The conclusions that we reach here are therefore that, contrary to the argument provided by Chick (1986), money did not become endogenous over time. In fact, money has been always endogenous because of the necessarily triangular relationship involving a payer, a payee, and the record keeper, even in those ancient times when money's functions were carried out using a precious metal or, more generally, a given commodity, and this with or without the existence of

"banks" as such. In modern times, the banking system cannot but always respond to the needs of the economy to produce and exchange real goods and services – within as well as across borders. This is so even under a gold-standard system, as Joan Robinson (1956) noticed cogently.

If the analysis provided in this paper is correct, then the resulting conclusions will have far reaching implications both in theory and in policy. In a theoretical sense, if we can show that money has always been endogenous, then it could be argued that the post-Keynesian theory of money is consistent from a historical perspective. In fact, we could argue that while money's endogeneity pre-dates the existence and development of the banking system, the visibility of this endogeneity has become more apparent in modern times. By this we mean that there is another way of interpreting Chick's stages of banking development: the secular evolution of the banking system has made the endogenous nature of money appear more and more evident as time went by. At the time of commodity money, say in the form of gold coins, the endogenous nature of money was more difficult to notice, because money was reified into a precious metal. Hence, it would be incorrect to infer from empirical evidence, or "surface" phenomena (Ingham, 1996, p. 527), that money, during the gold-standard period, was exogenous because it consisted of gold bullion and/or coins, and because gold was an exogenous quantity depending on mine discoveries, wars, trade, and so on. In fact, in macroeconomics empirical evidence cannot be directly derived from factual observation: the phenomenon rarely coincides with its factual appearance. Phenomena must be interpreted and their results evaluated, which can be done only via a conceptual detour. A theoretical framework is thus always required to understand the empirical givens, such as the apparently exogenous nature of commodity or central-bank monies.[27]

From a policy perspective, two points are worth emphasising. First, the fact that money has always been endogenous may well explain the practical difficulties and shortcomings of any monetary targeting strategies in policy making. In fact, as repeatedly pointed out by Goodhart (1994, p. 1425), "[i]f the central bank tried to run a system of monetary base control, it would fail." This sheds some light on the recently generalised preference for central bankers to adopt a monetary policy strategy based on a target for inflation rather than for a growth rate of a monetary aggregate such as M0, M2, or M3. This change in strategy, however, is not enough to curb inflation as long as the central banks' inflation targeting strategies stem from a quantity-theory-of-money approach (see Rossi, 2001). In fact, such an approach is openly in contrast with money's endogeneity, so much so that it is still grounded in the homogeneity postulate on which the neoclassical dichotomy is based, as advocated at the time of commodity money.

Secondly, the arguments developed in this paper might suggest that rather than seeing institutional changes (for instance, the creation of a central bank and financial innovations, or even the evolution of the banking system itself) as a *source* of money's endogeneity, institutional changes are the *result* of it. Money is endogenous irrespective of financial innovations, the existence of a central bank, or the stages of banking development. Money is endogenous in a revolutionary sense, not in an evolutionary sense. This conclusion is a truly fundamental argument for post-Keynesian and heterodox monetary analyses.

In short, as monetary and financial markets develop and evolve, the endogeneity of money implies that institutions have to comply with it as well as with the double-entry bookkeeping nature of money. The framework proposed in this paper might then help us, in policy as well as in theory, to analyse the role of these institutional changes properly.

Notes

1. Post-Keynesians agree that the supply of money is demand-determined in order to finance the needs of the economic system to reproduce itself and grow, through the use of bank loans. There is an agreement that banks are special, in this way, and that their role is of primary importance in economic activity. Moreover, there is also some agreement on the role of central banks in preventing financial crises by supplying banks with the liquidity they need.

2. The "revolutionary" essence of the definition of endogenous money proposed in this paper is tied to the spirit of Keynes's "revolution", namely, his attempt to break away from orthodox thought completely. It is a paradigm change with respect to neoclassicism, and in particular neoclassical monetary economics. Most horizontalists, especially those of the monetary circuit approach, do not agree with Chick's stages approach. This group includes, among possible others, Graziani, Lavoie, Rochon, and Seccareccia. Among structuralists, Wray would probably also side with the revolutionists.

3. See, for instance, Moore (1988), Wray (1990), Arestis (1992), Lavoie (1992), and Rochon (1999), among a great many others. Recently, a number of scholars have set out to verify empirically endogenous money theory. Among them, Shanmugam et al. (2003) look at Malaysia, Palacio-Vera (2001) studies the case of Spain, and Howells and Hussein (1998) consider G7-countries. See also Arestis and Sawyer (2003) in this respect.

4. Recently, a number of mainstream economists of the New-Keynesian perspective have acknowledged the endogenous nature of money, noticing that the rate of interest is exogenous and that the banking system creates money at the request of borrowers. Under the auspices of the so-called New Consensus model, which includes a Taylor-rule-based policy reaction function for the central bank, the similarities with the post-Keynesian approach are nevertheless limited. Indeed, while adherents to the New Consensus recognise the endogenous nature of money, they still believe in the long-run neutrality of money. Moreover, rather than seeing endogenous money as a natural occurrence in capitalist economies of production, they advocate the endogeneity of money on the grounds that the latter is the result of preferred policy, owing to the instability of the demand-for-money function. In other words, while New Consensus proponents have recognised the endogenous nature of money, they do not have a *theory* of endogenous money. In fact, as Arestis and Sawyer (2004, p. 442, fn. 2) clearly put it, the New Consensus approach considers "money as a residual with no further role for it [while the post-] Keynesian notion of endogenous money entails a fully articulated theory with clear policy implications where money and credit have important roles to play in their interaction with real variables" (see also Setterfield, 2004).

5. We leave undiscussed the issue of the financing of investment, as this is an issue of some disagreement in post-Keynesian thinking (see Seccareccia, 2003, Messori and Zazzaro, 2005, and Rochon, 2005).

6. Owing to space constraints, we do not address the roles of households and the State in this story. See, for instance, Wray (1998) and Rochon (1999) for elaboration on these roles.

7. Lavoie (1992, p. 201) argued that as long as banks "move forward in step" with the lending activities of other banks, they can lend as much as they want. Reference is made here to Keynes's *Treatise on Money*, in which he argued this point precisely. See Graziani (2003, p. 63) for a restatement of the same argument in justifying a central bank's role. Note incidentally that this argument was already made by Le Bourva (1962), whose English translation was published 30 years later (Le Bourva, 1992).

8. "According to Xenophanes, our earliest authority, coinage was invented by the Lydians. Herodotus, our next authority, seems to concur. The earliest coins have been found in western Asia Minor, particularly in Ionia and Lydia" (Cook, 1958, p. 261).

9. We do not discuss here the chartalist approach to money (see Wray, 1998), which explains the creation of money and its purchasing power by referring to the existence of taxes. See, however, Rossi (1999), Gnos and Rochon (2002), and Rochon and Vernengo (2003) for a critical discussion of the chartalist view.

10. The success of this argument within post-Keynesian circles remains a true mystery. Indeed, Chick (1992, p. 193) explains that the evolution scheme she used in her 1986 article was "invented during a graduate student's supervision". This might suggest that her stages hypothesis was put to the fore *ex nihilo*, without any preliminary historical investigation.

11. Courbis et al. (1991, pp. 321–2) also point out that in maritime trade, which was the dominant form of trade between cities in Europe and elsewhere, gold bullion and coins were not used, as a general rule, to settle debts, because of weight and space problems in shipping cargos that were much more useful for transporting real goods. To this evidence, Cook (1958, p. 260) adds that "the Phoenicians and other people of the East who had commercial interests managed satisfactorily without coined money." Further, "[i]n the Greek world of the seventh and sixth centuries [B.C.] it is hardly likely that merchants would have had more trust in coins, especially if (as must often have happened) the coins offered were those of another state and of another standard. So it seems reasonable to suppose that coinage cannot have been invented to ease the larger commercial transactions" (p. 260).

12. According to Lavoie (1984a), these are the two poles of money's endogeneity.

13. This point is unfortunately beyond the immediate scope of this paper, but has been dealt with extensively in a longer, unpublished version of it.

14. Lavoie (2003) explains that under the gold standard the money supply was not endogenously driven by supply-side considerations, such as balance of payment surpluses, as in the orthodox approach. He namely points out that any increases in the money supply caused by a trade surplus, for instance, are absorbed via the so-called "compensation effect" when debts are reimbursed, thereby neutralising such increases. These debts exist because either the banking system is in debt towards the central bank, such as in overdraft systems, or because bank borrowers reimburse their existing debt towards the banks, as in the traditional post-Keynesian endogenous money view. In an asset-based system, banks would use these added reserves to purchase bills (rather than reimburse debts with the central bank). Note that these excess reserves cannot be used by the banks to increase lending, since loans can only be made at the request of borrowers, and banks would have already extended their loans to creditworthy borrowers. Under the gold standard, thus, the money supply was still determined by the demand for loans.

15. By way of contrast, as another example of the evolutionary view, many post-Keynesians see money as being exogenous under the gold standard. For instance, according to Moore (2001, p. 20), "[w]hen money was a commodity, such as gold, with an inelastic supply, the total quantity of money in existence could realistically be viewed as exogenous."

16. If money is endogenous irrespective of the existence of a "bank" as such, it nevertheless requires the intervention of a third pole in any payment. In the contemporary framework, this role is assumed by banks, but one can conceive of it being assumed by other agents, as we discuss below.

17. Wray (1990) provides an insightful analysis of this approach. Unfortunately, this investigation has not been widely accepted or paid due attention by post-Keynesian scholars.

18. As Ingham (1996, p. 526) emphasises, "it is not being suggested that distinctions between different forms of money should not be made; for example, commodity money, fiat money, promissory notes, checks, credit cards, local exchange trading scheme (L.E.T.S.) tokens etc. Each has its own particular conditions of existence; but *all* such conditions are essentially social".

19. "All money is created and maintained by the social relation of credit–debt […]. These relations create the monetary *space* – that is, a *social* sphere in which *impersonal* exchange takes place" (Ingham, 2002, pp. 127–8).

20. See also Courbis et al. (1991, p. 319).

21. In a very interesting section of their paper, Courbis et al. (1991, pp. 329–31) note that even paper money, like bank money, is a form of credit-money. As a matter of fact, the economic foundation of any form of money is credit, not paper. In other words, paper money and bank money pertain to the same category, but of course paper money, notably in the form of bank notes, significantly increased and extended monetary circulation beyond those agents having a bank account. This, in fact, increased the size of wage-economies.

22. "In computing either the gross or the net revenue of any society, we must always, from their whole annual circulation of money and goods, deduct the whole value of the money, of which not a single farthing can ever make any part of either" (Smith, 1776/1978, p. 385).

23. See D. Ricardo (1816), *Proposals for an Economical and Secure Currency*, London: John Murray. Reprinted in *The Works and Correspondence of David Ricardo*, edited by P. Sraffa, Vol. IV, *Pamphlets and Papers 1815–1823*, Cambridge: Cambridge University Press, 1951, pp. 51–141.

24. See Copeland (1981) for a study of ancient banks.

25. This issue goes beyond the scope of the present paper. See Rochon and Rossi (2006).

26. As some post-Keynesians argue, even during periods of hyperinflation price increases are not caused by excess money growth. In this respect, Camara and Vernengo (2001) argue for instance that hyperinflation is not a monetary phenomenon, but finds its origins in foreign crises. In Germany, for instance, hyperinflation during 1920–23 was caused by the imposition of reparations and devaluation. According to Burdekin and Burkett (1992), an important feature of the German case was the way in which accelerating monetisation of both government and private debt by the Reichsbank fuelled the inflation process. In fact, credit demand by the private sector arising from more rapid adjustment of money wages over that period increased fiscal influences on nominal money growth at that time. Wage claims provided the main conduit through which higher inflationary expectations were accommodated by faster rates of monetary expansion.

27. See Rossi (2005) for elaboration on the endogenous nature of central bank money.

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