



Toward a General Theory of Credit and Money

MOSTAFA MOINI

mmoini@okcu.edu

Department of Economics, Oklahoma City University, 2501, N. Blackwelder, Oklahoma City, OK 73106, USA

“Practically and analytically, a credit theory of money is possibly preferable to a monetary theory of credit.”

Joseph A. Schumpeter

“Whether power to command the industry of others be not real wealth? And whether money be not in truth Tickets or Tokens, for recording and conveying such power? And whether it be of consequence what material the tokens are made of? ... Whether all circulation be not alike circulation of credit, whatsoever medium—metal or paper—is employed: and whether gold be any more than credit for so much power?”

Bishop Berkeley. *Querists*

Abstract. Money is not a thing but a species of credit, and hence a social relation involving rights and obligations. It emerged as the most abstract species in the course of the general process of evolution of credit. Formulation of a theory of credit is, therefore, logically prior to any theory of money. A framework proposed along this line by Macleod, during the second half of the 19th century, has been neglected until now. Combined with Walras’s *numeraire* and *etalon* concepts, this approach provides the foundation for a General Theory of Credit and Money, presented in this paper.

JEL classification: E5, E4, E0.

Introduction

Information Technology and deregulation are changing the meaning of the terms “bank”, “banking” and “money”. As money is increasingly recorded and transmitted in the form of digitally coded information, one is led to believe that perhaps money is not, and has never been a thing at all, as suggested by the medium-of-exchange concept. Rather it is a certain type of social relation about which the relevant information may be recorded and transmitted by a variety of means. This line of thought leads to a fresh investigation into the nature and origin of money.

Section 1 surveys some current developments in the payment system and shows that money and monetary policy are undergoing significant changes, which cannot be understood by means of the traditional concept of money. In Section 2 a distinction is drawn between “money” and “monetary instrument”, a concept that is treated more fully in Sections 10, 11 and 12. Section 3 argues that, coupled with certain questions arising from the dominance of Information Technology within the payment system, the said distinction is sufficiently fundamental to establish the grounds for the formulation of a new theory of money. Section 4 notes that money has a dual character in that it appears as one thing

from the perspective of an individual and another from that of the society. Section 5 observes that the contemporary concepts of money are confined within a paradigm that took shape during a period when metallic money dominated the payment system. It is suggested that the hegemony of this paradigm in economics has acted as the principal factor in preventing progress toward understanding the nature of money. Section 6 shows that although Walras provided a logical proof of the theoretical primacy of *etalon* over the medium-of-exchange function, and although he identified one of the two necessary components of any possible payment system, he did not succeed in breaking loose from the metallic paradigm. Consequently, he failed to draw the inferences that would have led him to the formulation of a General Theory of Credit and Money. In Section 7 it is shown that Wicksell's failure in this regard was also due to his metallic preconceptions. An initial view of the relation between money and credit is introduced in Section 8. This is followed, in Section 9, by the observation that it was not *indirect market exchange*, but rather credit and *indirect valuation*, that served as the basis of development of a unit of account, and that the latter *developed several millennia before the emergence of any media of exchange*. Section 10 shows that unit of account is prior to medium of exchange not only in history but also in logic. In Section 11 it is noted that, whenever and wherever a physical object has served as a medium of exchange, its sole function has been that of an instrument for recording and conveying information about credit relations within the community. But such function could have been, and indeed at times has been, carried out by arrangements which made no use of any physical objects at all. Thus, contrary to Menger's view, *a medium of exchange is a historical, not a logical category*. Section 12 shows that, from the dawn of history to the present, money has never been anything more or less than a person's outstanding rights against the expected stream of assets, goods and services supplied within the economy. Monetary instruments are devices that record and convey information about monetary rights. Section 13 provides a brief account of Macleod's credit view of money and Section 14 shows that this view provides a framework for unification of the theories of utility and money. Section 15 proposes two definitions of money, one from the perspective of an individual, and another from that of the payment system as a whole, showing that the two are subsumable under the notion of unconditionally transferable credit. The result of this analysis is presented as a unified theory of money. Section 16 shows that any payment system has only two essential components, namely, *etalon*, formulated by Walras, and the credit concept, formulated by Macleod. Section 17 notes that, because of hitherto improper concepts of money, property rights in money have not been well understood and are still wanting effective definition within the existing legal frameworks. This is one reason why the credit-forging activities of the state and banks have gone on so freely, in spite of their colossal external costs. In Section 18 the concept of monetary externality is defined and a particular taxonomy of its principal distinct parts is provided.

1. Money and Information Technology

In a few years nearly all banks will be offering direct banking, defined as all the various ways in which a bank customer can be served without the involvement of a person at a

branch (Levin 1999:1). ATM, phone banking, home banking, PC-based banking, smart cards, stored-value cards, E-money, Mondex, Cyber-Cash, the Internet, electronic data interchange, automated clearing house and electronic check presentment; the list continues to grow daily (Campbell 1997:342).¹

Because electronic technology has dramatically reduced the costs associated with recording and transfer of money, and because the costs do not depend on the amounts and distances involved, enormous economies have been realized in the financial sector and, as a result, global mobility of capital has increased significantly. One consequence of this is that domestic commercial banks are finding it increasingly difficult to compete with offshore or foreign banks. The latter can lure depositors away from the former by offering more favorable terms, which they can do by virtue of their lower costs due to the fact that they operate in less (and sometimes un-) regulated environments (Dowd 98:327).

In reaction to these events central banks in several countries, including England (Hall 1981:171), have abolished minimum reserve ratios altogether in order to strengthen the ability of commercial banks to compete in the global marketplace. Additional regulatory changes are almost certain to come. In a recent report to the U.S. Senate the Fed's chairman Greenspan (1999) noted that, in the absence of new regulation, commercial firms might soon be getting involved in banking business! A recent rule of Federal Deposit Insurance Corporation excludes the coverage of the balances carried on certain varieties of stored-value cards (FDIC 1996).

Should the use of smart cards for "micro-payments" become widespread, and should the currency in circulation be presented to the banks (and ultimately to the central bank) in exchange for deposits, then the monetary base and fiat money will come close to being vanished altogether. Coupled with the aforementioned trend toward removal of reserve requirement, this development will deprive the central bank from two of its existing policy instruments, namely, required reserve ratio and open market operations. Furthermore, the effects of the discount window and foreign exchange transactions will be of a different nature than before. As a result the central bank's discretion over the money supply will be seriously weakened, if not entirely dislodged.

The central bank's power of control will be curtailed further by the fact that, as coded information, money can be encrypted before being stored in or transferred between accounts. This renders it undetectable by monetary and other authorities. As a result, the global money supply can expand or contract, and may undergo redistribution within the global economy as it travels into and outside of particular economies, without there being any possibility for the central banks to measure its extent or influence its course. Whether this is desirable or not is a question that will be debated among economists for many years. Such debate is unlikely to be fruitful, however, if it is carried out on the basis of the hitherto accepted concept of money. In contrast, resort to the framework proposed in the present paper appears more promising.

So far the central banks have remained satisfied with keeping an eye on the developments and not pressing for major new regulatory measures. Schreft (1997:59–83) provides a preliminary discussion of the nature of the new means of payment, how rapidly they are likely to grow, and what the regulatory agencies could do in order to assure monetary stability in the economy.

While some economists (Helleiner 1998:387–388) remain satisfied with merely cautioning against overstating the significance of the technology impact as a challenge to the ability of the state to control money, others (Roberds 1997:43) go as far as denying the economic significance of these events altogether. They assert that money is still what it always was, and that, therefore, monetary policy can be expected to proceed along its traditional track.

But this view of the matter is of little help in understanding the evolutionary changes that are rapidly transforming the payment system. Information Technology is creating new muddle in the midst of what was already a hodgepodge of confused terms and concepts about money: inside money, outside money, base money, high-powered money, money substitutes, M1, M2, M3, to name but a few.

For example, Berensten (1998:89) observes that “network money refers to *software* that allows the transfer of value on computer networks, particularly on the Internet”. [Emphasis added. M. M.]. In what possible sense can money be regarded as some sort of software? Again: “A digital money balance on a smart card or computer hard drive is a form of credit because the balance is the liability of its issuer.” (Berensten 1998:89). In what sense is the money that is transferred from one’s deposit account onto a smart card or hard drive credit? The prevailing definition of money (M1) includes demand deposits and currency holdings of a person. If positive balances on smart cards function like currency, why shouldn’t they be called money, instead of credit? Perhaps, in the world of cyber-finance, everything should be called credit, demand deposits included! That is certainly the sense in which Wicksell used the term credit in his “imaginary pure credit system” (Section 7). Clearly some fundamental rethinking of the terms, money and credit, is in order.

2. Money and Monetary Instrument: A Preview

It will be shown in Sections 11 and 12 that a fundamental distinction must be drawn between *money* and *monetary instruments*. In this section the problem is introduced and a preview of its significance is presented.

In every case of a payment made by one person to another, the Right transferred is money but the specific means used for recording or otherwise effectuating the transfer of the Right is a monetary instrument. Thus none of such things as cowries, gold, “paper money”, paper-based or electronic checkable deposit is money. These are rather varieties of monetary instruments. Money has always been and will always be one and the same thing, namely, a certain species of Right. Monetary instruments, on the other hand, have assumed a bewildering variety of forms at different times and in different places, ranging from animal skin and beads to strings of electronic pulses.

In the form of electronic checkable deposit the instrument representing money exists as an information entity only, lacking mass, volume, shape or any other corporeal feature (as far as practical human interest is concerned, the physics of the problem being irrelevant). Such absence of any reference to sensible qualities challenges the habitual image that money must be something physical, and points toward the notion that the essential function of a monetary instrument resides in its ability to serve as a device for recording and conveying information about monetary rights. It remains for theory to demonstrate that what is nakedly clear in

this case is indeed the essence of the phenomenon in question in all its particular manifestations, including where the monetary instrument may consist of some sort of physical device.

In the absence of the said distinction between money and monetary instrument these two radically different meanings remain fused together and are latently present in every application of the term “money”. Such equivocation is sufficiently problematic to render the term unfit for use in scientific work on the subject. It follows that all hitherto produced writings on money stand in need of critical reexamination so that their useful parts may be sifted apart from the useless and misleading parts.

While the said equivocation has acted as the principal retarding factor in the development of monetary theory throughout its history, in the era of Information Technology it proves even more paralyzing. In this sense the technology-driven evolution of the payment system is in itself forcing the economists to investigate the possibility of important substantive relations between money and information.

This line of thought proves to be fruitful. Observe that the increasingly explicit role of information in the payment system is not a particularly new happening, but rather the continuation of an evolutionary process that has been going on already for several centuries.

By its very nature, deposit banking relied, quite explicitly, on information devices in order to record and transfer money in and between accounts. Payments would be made primarily by means of adjusting the bookkeeping entries that represented the accounts of the depositors. These entries were in every sense as abstract as their electronic counterparts in a modern bank.

However, although the accelerating predominance of electronic media has not changed the nature, but only the technical means, of carrying out the information processes within the payment system, nevertheless it has led to the emergence of a vast array of new monetary phenomena and problems. Many of these have far-reaching theoretical and practical implications.

The incredible superiority (in terms of speed and efficiency) with which electronic storage, retrieval, processing, and transfer of information is carried out, compared to the paper-based system, has posed fundamentally new types of problems for monetary authorities. Failure to understand the new events and their implications, individually, and in their totality, is a source of serious threats to the stability and performance of the individual economies, as well as the entire global economy.

Should the use of electronic medium evolve to the point where all other monetary instruments become superfluous, then there will no longer exist any tangible thing to be held, handled and referred to as money. Money will come to assume, exclusively, the form of a pure accounting entity—an abstract category—, which varies as a particular account is credited at the expense of debiting one or more other accounts. Thus money can no longer be viewed as *a thing that stands by itself*, but rather as *a relation that necessarily involves two or more persons*.

This insight exposes the emptiness of the notion of money as “anything that serves as a medium of exchange.” In Section 15 this idea is developed fully and it is shown that the notion must be abandoned in favor of the theoretically promising concept of money as *unconditionally transferable credit*.

Such insight about the true nature of money is in a sense induced by the very process of technological evolution of the monetary-instruments. The instruments that have represented monetary rights have, in the course of history, progressively shed their physical forms and the final result is the stage wherein money has come to exist as an abstract information category.

3. Grounds for a New Theory of Money

It may be noted that the critique of the thing-view of money in this paper is directed not only against the notions of its most zealous proponents, the modern gold standard theorists, whose “commodity money” concept epitomizes the view. It is put forth also against the less obviously fallacious views, but equally so, of those who think of money, not necessarily as a *physical thing*, but nevertheless as a *thing*, that is, *an entity that can stand by itself*, rather than as a relation involving at least two persons. From the perspective of the credit-view of money the proponents of the thing-view belong to the same camp. It matters little whether the thing in question is conceived of in physical terms, as done by many Austrians, or otherwise, as is the case with the mainstream economists.

Lest the mainstream economist deny his/her adherence to the thing view, let it be noted that economists finally agreed to recognize demand deposit as money² only after an unusually long, uninteresting, and barren debate.³ And the issue was never really resolved on *theoretical* grounds. The obviously relational nature of demand deposits did not get noticed by anyone. That polarity (of credit-debit) is as inherent in the notion of money as it is in that of a magnet remained unrecognized by every one of the prominent neoclassical economists. And this state of affairs has continued to the present day.⁴

Not grasping the nature and significance of the said polarity in the notion of money is precisely what is missing in the standard textbook practice that defines money as “anything that serves as a medium of exchange”. The arbitrary extension of the medium-of-exchange concept to include demand deposits is no proof of abandonment of the thing-view by the adherents of the standard definition. Empiricism is no substitute for theoretical concept formation. As noted already, the essential difficulty with the concept is not in its insistence that money should be some sort of physical entity—metal, paper, or otherwise—which can be held and handed over to others. The problem lies rather in not recognizing that *money is a definite form of social relation in the sense that its very conception involves a right-obligation coupling between persons within the payment community*.

Indeed the very course of evolution of monetary instruments—which shows that things in “circulation” have been increasingly supplanted by abstract deposit accounts—itsself constitutes a historical proof of the truth of the credit-view of money. But this is merely an empirical matter, one which can prove useful only if, and to the extent that, it comes to serve as a new point of departure for the formulation of a new theory, one which is more fruitful than the existing one. The task of the theorist is to grasp the fundamental nature of the said empirical phenomenon, to formulate a general theory in order to explain it, and—in the light of the new insight—to subject to critical reexamination the *totality* of the hitherto accepted concepts of money. As well should be examined the ways in which the ramifications of the traditional concept of money in the various fields of economic theory

would have to undergo modification or reformulation in order to be made consistent with the new theory. Completion of this task would require extensive work by a full generation of younger economists.

Progress may be made by focusing on the nature and functions of the payment system rather than on the technicalities that bubble on its surface. Thus the observation that money is now predominantly recorded and transferred as information is in itself a commonplace. Far from trivial is, however, a related idea that points toward an inquiry of enormous theoretical significance: *Can it be the case that from their earliest beginnings at the dawn of history all payment systems have always been information systems and nothing but such systems?*⁵ Investigation of this question is bound to transform monetary thought for good, and down to its core.

Experience with Cyber-Money is showing that it is entirely possible for a payment system to operate without any physical entity such as a bead or a dollar bill. By induction one is led to suspect that perhaps information is the ultimate substance and principle that lies behind any possible kind of payment system, the variety of physical and nonphysical “monies” encountered throughout history notwithstanding. This conjecture turns out to be true. It will be shown in Sections 11 and 12 that the various objects that have served as media of exchange throughout history have done so by virtue of their roles as recorders and transmitters of information. The “money-ness” of gold resided in its capability as an instrument for conveying information about a certain kind of abstract rights.

If payment systems have always consisted essentially of nothing but information systems, then the significance of the digitized payment system cannot be sought in the fact of its being one such systems, but rather in those features that differentiate it from its earlier progenitors. Undoubtedly these reside in the incredible economies with which monetary information is stored, processed and transmitted. Having resulted from the revolution in Information Technology, these economies have all but dwarfed those that were caused by the Industrial Revolution in the fields of transportation, agriculture and manufacturing.

But the influence of Information Technology is likely to reach beyond its impact on the actual course of events in the economy, forcing fundamental rethinking of the very concept of money. For if it is true that payment systems are essentially information systems, then a number of important theoretical questions present themselves immediately: What kind of information is handled by the payment system? What does the system record and convey? How have the various objects and institutions that have functioned as money in the past handled and conveyed the similar information? The quest for answering such questions provides the ground for the formulation of a new theory of money, based on the notion that money is not a thing but a species of credit. This theory has its historical roots in two seemingly unconnected traditions in monetary theory, namely, the works of Walras [(1969, 1926)] and Macleod (1882, 1893). The latter has remained practically unknown until now.

In this paper I formulate a General Theory of Credit and Money on the basis of Macleod’s credit view of money and Walras’s *numeraire* and *etalon* concepts. I show that any payment system has only two fundamental requirements: (1) an *etalon*, and (2) an information system that records—in terms of the *etalon*—the rights and obligations that arise in the course of transactions between the members of a payment community. But initially it is essential to examine the historical roots and the *raison d’etre* of the prevailing concept of money.

4. The Dual Character of Money

Dissatisfaction with the state of monetary theory was widespread toward the end of the neo-classical period. Menger (1892:2) noted that “the enigmatic phenomenon of money is even at this day without an explanation that satisfies; nor is there yet agreement on the most fundamental questions of its nature and functions.” And Wicksell [1962:5 (1898)] complained that “the progress of monetary theory and practice has not done much to secure the desired stability of the standard of value and of prices”. Mirowski’s (1988:153) characterization of the situation is worth quoting: “... Most economists would admit that the introduction of money into the neoclassical economic theory has been an awkward marriage at best and a shotgun marriage at worst.”

Even the question of whether money is wealth or representation of wealth has remained unresolved from the earliest days of monetary theory to the present. Boisguillbert and James Stuart held the latter opinion (Schumpeter 1954:293), and Mises did not succeed in providing a *theoretical* answer to the question. He simply stated that money is private, but not “social capital” (Mises 1953:86–90).*

However, by the precision with which he expressed the distinction between the private and social perspectives, Mises drew attention to an important aspect of money. Money has a dual character: it means one thing from the perspective of the individual, and another thing from that of the payment system as a whole. Henceforth these will be referred to, respectively, as the individual or personal perspective, and the system-theoretic perspective. Ideally, any theory of money should integrate the two perspectives within one and the same theoretical framework.

That the two perspectives are implicitly present in all significant writings on money—though true—cannot be fully substantiated here. Only by way of example it may be noted that Keynes uses the terms “Money-of-Account” and “Money itself” to refer to the two: “Money-of-Account, namely that in which Debts and Prices and General Purchasing Power are expressed, is the primary concept of a Theory of Money.... Money itself, namely that by delivery of which debt-contracts and price-contracts are discharged, and in the shape of which a source of General Purchasing Power is held, derives its character from its relationship to the Money-of-Account, since the debts and prices must first have been expressed in terms of the latter” (Keynes 1930:3).⁶

Each of the two perspectives has led to the development of a distinct set of monetary concepts that have evolved in separate channels. This dichotomy is perhaps one of the chief factors responsible for lack of progress in understanding the nature and origin of money. Reconciliation of the two aspects is a *sine qua non* of further progress in monetary theory. This is attained by the credit-view of money.

*By his epistemological contributions Mises succeeded in eliminating certain formidable methodological barriers that hampered progress in economics. Foremost among these contributions were (1) clarification of the a priori nature of economic reasoning, and (2) formulation of the principle of methodological individualism. Absence of frequent references to his work in this article understates the extent of my debt to him and others in the Austrian tradition. Even though I find the Austrian theory of money as objectionable as that of the mainstream economists, it was Mises’s writings on money that showed me what constituted the fundamental questions in this field. Such is the quality of Mises’s thought that he teaches even through his failures.

Of course the reason for the emergence of the two separate channels of development is to be sought in the dual character of money itself. As a reckoning factor, money is not subject to a person's preference structure. It is rather an externally given fact confronting the person as a nexus of information about prices, which result from the operations of the market system. This aspect of money relates to the economy as a whole, to the general equilibrium of all prices, and to the nature of the payment system in its entirety. Thus from the system-theoretic perspective money is *not a thing but a relation*, or rather a system of social relations.

On the other hand, from the personal perspective, money is a good, a *thing* that supplies the individual with utility, and it is, therefore, subject to the preference structure of the person who holds it. That money is at the same time a useful thing as well as a system of social relations is another way to express its dual character. Apparently serious equivocation is associated with the term money. The standard definition of money as "anything that serves as a medium of exchange" provides no help for the resolution of this problem. Money is yet to be defined!

The dual character of money is reflected in the development of monetary theory in the form of a number of Special Theories. Their partial nature notwithstanding, these theories have helped amass sufficient knowledge concerning the phenomenon of money to make possible the formulation of a theory that would be free from the existing conceptual difficulties.

Among the Special Theories, Walras's monetary theory, and Macleod's theory of credit are of great interest in relation to the line of research pursued in this paper. Synthesis of these hitherto separate theories can lead to the formulation of not only a General Theory of Credit and Money, but also a Unified Theory of Money and Price. This article is concerned with the former of the two only. Before turning to an examination of the two Special Theories it is appropriate to develop an overview of the general milieu of monetary theory within which these theories developed.

5. The Metallic Paradigm

Neoclassical economists adhered to what Schumpeter calls a "strictly metallist conception of money", a view that draws a sharp distinction between money and the legal instruments that embody claim to money (Schumpeter 1961:318).

The primary concepts and language of classical as well as neoclassical theories of money took shape on the basis of experience with metallic money. Observing that, at different times and in different places, quite a variety of physical objects had served as money,⁷ economists coined the generic term "medium of exchange" to refer to any such object. Next they proceeded to show the advantages of precious metals over other substances, and the reason for the emergence of gold as the most-preferred medium of exchange. In this way "money", "species" and "gold" became synonymous terms, and it appeared that the task of any theory of money consisted of showing how the process of evolution of the media of exchange had resulted in the emergence of gold as the most preferred medium.

This was, for example, how Menger understood the problem. He undertook to explain how the most marketable good tends to emerge as a medium of exchange on the basis of the exigencies of indirect exchange (Menger 1892:1). This amounted to no more than

paraphrasing Roscher's oft-quoted statement that "the false definitions of money divide up into two main groups: those that consider it to be something more, and those that consider it to be something less, than the most saleable commodity" (Roscher 1854, Translated and quoted by Schumpeter 1961:1086).

Because Menger's is a theory of evolution of medium of exchange, it should be regarded as a Special, rather than a General Theory of Money. At the time of its writing this theory was already outdated by more than half a century. As far back as 1850, Mill (1850:521) had noted that demand deposits had already become the primary means of payment in England, and that gold was no longer being used as a medium of exchange.

Far from being an isolated case, Menger's concept of money exemplifies the neoclassical view of the matter, and indeed constitutes one of its more lucid formulations. As noted by Schumpeter (1961:1087), in the period prior to 1914 the majority of economists accepted Roscher's definition of money as the most saleable commodity. This view lies at the root of the neoclassical monetary paradigm.

This conception focuses unduly on the personal perspective of money, to the exclusion of its system-theoretic side. To the extent that the latter is noted at all it is present peripherally and implicitly as the "unit of account function", which is listed on equal footing along with the "standard of deferred payment function", etc., concepts, whose very presence demonstrate the absence of theoretical rigor in the discourse.

Not a single text ever written on money and banking has noted the unique theoretical significance of the unit of account concept and the need for discarding the other so called "functions of money" as conceptual blunders and misconstructions. None of them has ever bothered to explain the unit of account concept in its genuine Walrasian sense. As though mere mentioning of the term suffices as a substitute for the rigorous formulation of the concept that undoubtedly constitutes one of the paramount achievements of neoclassical monetary thought. Apparently adherence to a false conception of money has prevented economists from so much as even perceiving what does, and what does not, constitute a significant contribution within the vast arena of monetary literature.

It is shown in the next section that even Walras himself failed to perceive the full array of implications that his formulation of the unit of account concept had for monetary theory. He fell back, quite unconsciously, on the very metallic notion of money, which was undermined by his own formulation. That Wicksell also attempted to straightjacket demand deposits into the confines of the metallic framework shows the extent of the hold of the metallic paradigm on the mind of the economists during this period (Section 7).

It is noteworthy that long before Thomas Kuhn formulated his concept of paradigm and showed its operation in various fields of science, Schumpeter had already noted a parallel between the behavior of physicists and economists in relation to the new theories in their fields. Just as the former were extremely reluctant to abandon the framework of classical physics, even when new experimental findings seriously challenged it, economists insisted on bringing everything they learned about the payment system under a "strictly metallist conception of money" (Schumpeter 1961:318-319, including the footnote).

Once the metal lost its role within the payment system almost completely then emerged the "functions-of-money" approach to the definition of money. But this was no more than

a makeshift operation, a theoretical blunder, and a desperate strategy to offer as theory what was essentially a hodgepodge of useless generalizations. Gold had been put aside but the metaphor that gold had induced, the notion that money must be a thing, lingered on. Monetary theory put on a new skin but its core and content remained the same as before.

What lies at the heart of the conceptual difficulties that have blocked progress in monetary theory is the question of whether money is a thing or a species of credit. To this day this problem has escaped recognition, let alone analysis. But through the varied channels of special theories, such as those formulated by Walras and Macleod, the essential components for resolving the problem have been developed already.

6. Walras and the Credit Theory of Money

Schumpeter (1961:1082) is entirely correct in hailing Walras as the creator of the modern theory of money. Undoubtedly formulation of the concepts of *numeraire* and *etalon* as aspects of his general-equilibrium analysis constitutes a towering achievement in the development of the field.

Walras notes that "... The situation of a market in a state of general equilibrium can be completely defined by relating the values of all the commodities to the value of any particular one of them. That particular commodity is called the *numeraire* [or standard commodity]; and a unit of this commodity is called a standard [*etalon*]" (Walras 1969:185). I shall conform to the Keynesian terminology, using the terms Commodity of Account (rather than Standard Commodity) and Unit of Account as synonyms for *numeraire* and *etalon*, respectively. The prevailing loose practice of using the term *numeraire* to mean a Unit of Account is not permissible. If, say, wheat is the Commodity of Account (*numeraire*), then a bushel of wheat is a Unit of Account (*etalon*). The former is a name, the later a definite quantity of the thing named.

Thus Walras showed that a Unit of Account is implied by the very existence of a system of prices which arise in a situation where m commodities are exchanged.

Having discovered a "true ... measure of value and wealth" in his concepts of *numeraire* and *etalon*, Walras turned to "money", noting that, "in general,... the commodity which serves as *numeraire* serves also as money and acts as a medium of exchange. The standard of measure of value thus becomes the monetary standard. The two functions are, nevertheless, distinct, even when they are found in the same commodity" (Walras 1969:189).

The remark that "The two functions are distinct, even when they are found in the same commodity" is of great interest because it points out the necessity of isolating the concept of *numeraire* (and a unit of it, *etalon*) as an indispensable component of any payment system. Significant is also the statement that "The standard of measure of value thus becomes the monetary standard", for it contains an essential element of what is needed for the formulation of a unified theory of value and money.⁸

But, in so far as monetary theory is concerned, Walras provided no additional contributions beyond those already mentioned. Having obtained such important analytical results, he began at this point to depart from his customary mode of investigation in which he would proceed faithfully in the spirit of pure theory to extract all the significant

implications of what had been established already. Instead (as seen below) he succumbed to empiricism.

Were it not for this unfortunate event, he would have been forced (by the logic of what he had already discovered) to formulate a *theoretical payment system*, one in which no medium of exchange would be required but only an *etalon* and a banking system. The payment system would then operate effectively as banks would credit and debit the accounts of the members of the payment community in line with the rights and obligations that arise as a result of their ongoing transactions.

However, not only did Walras fail to formulate such system but, strange as it may seem, to this day no other economist has turned to the task either. It appears that monetary theorists have failed altogether to so much as even perceiving the need for the formulation of a *theory of payment systems*. The exception is Wicksell, who, however, failed to apprehend the full significance of his brilliant formulation of an “imaginary pure credit economy” (Section 7). Another exception is Schumpeter. But he went only a very short distance in this direction and made no attempt to tackle the subject by way of full-scale analysis. His ideas, suggestive as they were, remained limited to scanty remarks spread out in a disconnected fashion here and there throughout his works.

How could have so many brilliant minds failed to note the significance of formulating a theory of the payment system, unless their accepted paradigm prevented them from proceeding in the proper direction?

Had Walras envisioned such a system, a credit theory of money would have been constructed almost in its entirety, and the subsequent history of the world would have probably taken a different course.⁹ This is so because such theory would have exposed the fallacies of all inflationary policies and practices (and their underlying “theoretical” rationalizations). The analytical constructs of such theory would have generated such clarity of thought and precision of concepts that no room would have been left for any of the ifs and buts that have usually served and continue to serve as the basis for the politicization of monetary affairs.

However, the conception that money must be some sort of thing lies at the foundation of the neoclassical monetary paradigm. Indeed, in the very passage (just quoted above) in which Walras summarizes his analytical contributions lies also the kernel of what prevented him from arriving at where he should have arrived. I am referring to the statement that “in general,... the commodity which serves as *numeraire* serves also as money and acts as a medium of exchange.” Here he leaves no doubt about his adherence to the notion that money must be some sort of thing, the concept of “commodity money.” This was a fatal error, because it prevented him from perceiving the possibility of a purely accounts-based payment system. One cannot come to the idea of an abstract payment system if one is paradigmatically predisposed to be looking for some concrete thing.

Walras’s adherence to the idea of “commodity money” diverted monetary theory away from the unit of account concept and back into the dead end of the thing-concept of money. It aborted the development of what in retrospect appears to have been an analytical breeding ground for the formulation of the distinction between money and monetary instruments. This distinction is latently present in the very paragraph that is the subject of our discussion here (Walras 1969:189).

In sum Walras ended up re-entangling the very things which he had worked so hard to disentangle, namely, the two concepts of unit of account and medium of exchange. This was undoubtedly a backward step in the development of monetary economics. Now more than a century later the said entanglement continues to act as the principal stumbling block in the path of development of monetary theory.

Another aspect of the aforementioned paragraph is of interest to our analysis, namely, the remark that “in general,... the commodity which serves as *numeraire* serves also as money and acts as a medium of exchange” (Walras 1969:189). It should be noted that *this is not an analytical result but a casual observation about the empirical events associated with money*. In the field of monetary theory such casual empiricism is not unique to Walras. It characterizes all the conjectural histories, which claim that money has evolved as a medium of exchange in response to the difficulties of barter. But to the extent that these conjectures may be supported by historical evidence, they relate to the evolution of monetary instruments not money (Sections 2 and 11). Ethnological studies have documented numerous cases in which payment systems have existed and operated quite effectively without the presence of a medium of exchange (Sections 9 and 10).

Although at Walras’s time such ethnographical materials were not available to the extent they are now, there did exist for him the opportunity to observe and analyze an important monetary phenomenon—one which should have impressed his theoretical mind—namely, the increasing role of demand deposits within the payment system. That he was aware of the importance of this development is shown by the title of “Lesson 33” of the *Elements*: “Fiduciary Money and Payments by Offsets”. Here he notes that Book Credit, Commercial Paper, Bank Notes, and Checks make it possible to carry out trade without the intervention of “metallic money”. But such transactions still presuppose the use of *numeraire* and (metallic) money, “for even when precious metals are absent in fact, they are always present in principle” (Walras 1969:362). Although the intervention of *numeraire* and money is “not real, but virtual”, without this intervention it would be impossible to keep debit and credit accounts, or to carry out the required calculations related to lending and borrowing. (Walras 1969:362).

Walras obviously fell on a wrong track here. Speaking of the *numeraire* and (metallic) money as though these were *analytically* inseparable, amounted to letting go of his own paramount achievement in having separated the two before. As noted above already this error followed from his failure to formulate the critical concept of *monetary instrument* as distinct from *money*. Seeing that the payment system of his time worked by the use of some objects as means for making payments he falsely generalized and concluded that all payment systems must rely on some sort of object. He failed to note that the phenomenon was not necessary but empirical and contingent, a *historical* coincidence of events wherein the unchanging substratum of the payment system, i.e. money, assumed one of its many possible forms of representation.

Thus Walras remained within the confines of the medium-of-exchange paradigm, and failed to take the final critical step that would have guided him toward the formulation of a General Theory of Credit and Money. Such theory would have pictured the economy as having a payment system in which all the rights and obligations that arise in the process of exchange may be recorded as credits and debits in some kind of

“social balance sheet”, without any reference whatsoever to a tangible medium of exchange.

Because he had already amassed practically all the required elements for such formulation, his failure to arrive at the final result toward which his work was naturally pointing remains as puzzling as unfortunate. The only possible explanation is that this is yet another testimony to the truth of Kuhn’s observations concerning the enormous power of a paradigm.

The paradigm of metallic money must have had a very strong hold on the minds of the economists as late as the early decades of the 20th century. In so far as no fundamentally new theory has been put forth since that time to help break through the metallic paradigm, contemporary monetary economics continues to carry on within its confines, the illusion of progress induced by the elaborate outer shell of mathematical niceties notwithstanding. Of course (except for a small group of energetic gold standard theorists) the fetish is no longer gold but some *thing* else.

7. Wicksell’s “Pure Credit” System

Although Wicksell was fully aware of the importance of the concept of credit in relation to the understanding of monetary phenomena, like Walras, he was too engrossed in metallism to be able to formulate a satisfactory credit theory of money. “A promise to pay”, he writes, “—if properly secure and redeemable at will—is just as good a pledge or reserve as is a supply of the [metallic] medium of exchange” (Wicksell 1946:24). Thus in his view money is a primary, and credit a derived fact, a substitute for money.

Nevertheless, implicitly he makes credit primary in his “imaginary system of pure credit”, described as a system in which checks serve as the sole means of payment (Wicksell 1946:87–88, 122). “Theoretically this ... system is of extraordinary interest, in so far as it provides a very important means of appraising the factors influencing the value of money...” (Wicksell 1946:88).

Although he used such a system with great advantage in his analysis, Wicksell failed to notice its relevance to the investigation of the nature and origin of money. He remained entirely confined within the tangible medium-of-exchange paradigm, relying on metallic money and the “velocity of its circulation” as the primary concepts of his monetary theory. “... Credit is a very powerful, indeed the most powerful, means of quickening the circulation of money.” (Wicksell 1946:65). Demand deposits are forms of credit and the “influence of credit on the currency may, *under all circumstances* [Wicksell’s emphasis], be regarded as accelerating the circulation of money” (Wicksell 1946:67).¹⁰

Observing that English, German, and American banks were relying extensively on payment by checks, he was convinced that “developments were in this direction.” But he failed to deduce from this that his “imaginary system of pure credit”, far from being an arbitrary, imaginary construct, constituted the very essence of any payment system (Wicksell 1946:87). Instead he went to ridiculous extremes to force demand deposits into the prevailing conceptual framework of metallism:

“The occasions on which credit actually replaces money [by which he means gold, M. M.] and thereby renders it superfluous may, quite simply be regarded as special cases

of the general acceleration of circulation; for instead of purely physical transfer we have a virtual i.e. a merely imaginary or possible transfer, but of the same effectiveness” (Wicksell 1946:67). And “If ... more of the medium of exchange were required, this would be obtained quite simply by the [single] bank increasing its discounting of bills or its lending in general, by which a corresponding flow of deposits would automatically flow in. *The virtual velocity of circulation would thus tend to increase to infinity* [Emphasis added, M.M.]. A very small quantity of money would suffice for a very large turnover” (Wicksell 1946:85).

Wicksell is thus seen to be fixated on “commodity money” as the only possible money and assigns to anything else that serves as money an auxiliary role, one that facilitates the circulation of the money proper, namely, gold.

How could a person whose model of an “imaginary pure credit economy” was, in a sense, the very first formulation of a theoretical payment system in economics, fall back on primitive metallism? His failure to see the absurdity of assigning to demand deposits an auxiliary status, while in reality these were already serving as the primary means of payment testifies, once again, to the truth of Schumpeter-Kuhn paradigm theory.

The situation is even more puzzling when two facts already noted above are put side by side: On the one hand Wicksell considered his model of “pure credit” analytically very important (Wicksell 1946, Chapters 7–9). And on the other hand he was convinced that the actual payment systems in various countries were evolving in the direction of complete reliance on deposit banking. In other words, developments occurring in economic theory and in the actual payment systems were showing clearly that credit constitutes the permanent substratum of all payment systems. But he failed to infer this result and tried, instead, to force these facts into the conceptual straightjacket of metallism.

To this day economists consider money as a primary and credit as a derived notion. They define credit in terms of money, and consider the practice to be too obviously true to need any justification! But this only manifests the extent of the hegemony of the prevailing paradigm. *The relation between money and credit, far from an obvious triviality, constitutes the very core of the problem of understanding the nature of payment systems.*

8. Credit and Money as Social Relations

Credit is a relationship of trust and confidence between two or more persons. “Credit means that a certain confidence is given, and a certain trust reposed. Is that trust justified? And is that confidence wise? ... Credit is a set of promises to pay; will those promises be kept” (Bagehot 1906:22)? Thus the expectations of at least one other person to the effect that a particular person will honor his/her promises constitutes the essence of credit. For this reason it may be asserted that credit is necessarily a *social relation* as opposed to a *thing*.

What differentiates credit from other social relations is the fact that *it arises from the exchange of goods and services* between two or more (natural or legal) persons. *Should it be possible to establish that money, in whatever form, is a species of credit, then money too will have to be viewed as being a social relation rather than a thing.*

The idea that money is a species of credit may appear to contradict the “obvious” truth that credit instruments consist of claims to money. If credit is a claim to money, then money

must be prior to credit, both in concept, and in daily practice, now and throughout history. Such is indeed the appearance of the matter.

The reality of the matter, however, is otherwise. As shown in Sections 9 and 10 it is actually credit that is prior to money not the other way around.

Were we to assume, for the time being, that money is a species of credit, then money may be viewed as a claim that is always past-due, an unconditional sight draft that is honored by every participant in a payment community. This is to be contrasted with other credit instruments, which are not abstract (that is, completely unconditional) but rather restricted claims; claims that are conditioned by such qualifications, among others, as when, and against whom they may be exercised. “The banknote is, in essence, a draft at sight payable to bearer, which has been substituted for an instrument payable to order at maturity” (Walras 1969:363). When a person discounts, say, a 90-days bill with a commercial bank, and as a result her account is credited for a certain amount, all that is really happening is *an exchange of one type of credit instrument, the bill, for another, the demand deposit*.

It should be noted that, though quite significant for monetary theory, in itself this observation provides only a new point of departure. Much more is required for the formulation of a complete credit theory of money.

Note, for example, that although the statement just quoted above from Walras is quite suggestive in the direction of a credit theory of money, it did not lead him to so much as even suggesting the significance of this line of investigation. He went on thinking in terms of “commodity money” and treated demand deposit as a species of “fiduciary media”, which functioned as substitutes for the former.

This view is diametrically opposed to the notion that money is a species of credit, according to which credit assumes a fundamental, and money a derived position in economic theory. Should the latter view be substantiated, then *theory of Money will have to be treated as a subdivision of the General Theory of Credit*.

These concepts are not entirely lacking precedents in the literature. Schumpeter notes that in the customary analysis of money and credit the latter is regarded as claim to, and a substitute for money. But “logically it is not clear” that this is the most useful approach (Schumpeter 1961:717). It may be more fruitful to start from credit transactions in the first place, “to look upon the capitalist finance as a clearing system that cancels claims and debts and carries forward the differences—so that ‘money’ payments come in only as a special case without any particularly fundamental importance. In other words: *practically and analytically, a credit theory of money is possibly preferable to a monetary theory of credit*” [Emphasis added. MM] (Schumpeter 1961:717).¹¹

If credit is the primary, and money the derived concept, then the basis for the explanation of the nature and origin of money should not be sought within the domain of barter and indirect exchange, as hitherto done by economists, but in the concepts and facts of credit. This observation justifies a close examination of the origin and nature of credit.

9. Credit, Indirect Valuation and Emergence of Unit of Account

Credit is the present right to a future payment (Macleod 1893:88). The form or substance in which the payment is to be made is in every case specified or understood in the course

of the transaction that gives rise to the credit. A postage stamp is a bill, representing credit, payable in postal service. A concert ticket purchased perhaps a month in advance is a bill payable in the attendance to the concert. A loan in wheat issued, say, six months before the time of the harvest, and payable in wheat at that time is a credit—a right to receive on the part of the lender and a duty to pay on the part of the borrower (Macleod 1893:87).

In the course of evolution of market economies many credit instruments have emerged, among which some take the form of contracts that enable borrowers to access sums of money at particular points in time in exchange for their promises to pay back the principal and interest later. This has led to the erroneous view—universally held by economists today—that, theoretically credit is dependent on and derived from the concept of money. Such conclusion lacks theoretical foundation. It is based on an empirical judgment about the appearance of the observed events. In reality the exact opposite is true. Credit stands prior to money, both logically and historically. *Money is a species of credit, and its development can be understood only as an aspect of the general process of evolution of credit.*

Einzig, in his unique and impressive survey of ethnographical studies of money, correctly observes that the conception of Hildebrand according to which there were “three stages of evolution, natural economy, money economy, and credit economy, is entirely wrong.... There are many ethnological instances of credit in kind in communities where no trace of any medium of exchange or even standard of value could be found” (Einzig 1948:372).¹²

Deferred payments developed long before money for a variety of reasons, such as discrepancies in the values of the goods or services bartered, deferred deliveries due to seasonal conditions, borrowing in kind to pay ransom fines, tribute, blood money, bride money, etc., and other factors (Einzig 1948:372).

Loans of nonspecific (fungible) things such as grain, as opposed to identifiable (non-fungible) ones, like animals or tools, may have served as basis for the development of, not only the standardized commodity, but also measurement units of all kinds.¹³ It is evident that such units had to have developed prior to the development of a unit of account (Homer 1963:19). And the latter tends to develop as instances of inconsistency between direct and indirect valuation of goods and services are noticed and gradually narrowed.

Thus the process of development of consistency of exchange ratios between various goods and services did not have to wait until the emergence of well-developed markets, as is widely believed. It started already at the dawn of history, as primitive man attempted to evaluate things that he had to give or receive in the context of the web of mutual rights and obligations that characterized the extended family and tribal modes of existence. In this process indirect valuation would be unavoidable.

Indirect valuation is not the same thing as *indirect exchange*. The former constitutes a presupposition for the latter and, as such, comes prior to it both in logic and in history. Attributing the force of logical necessity to the process of indirect exchange is unwarranted. Menger did so because he failed to appreciate the role of credit in the process of exchange and this omission prevented him, among other things, from drawing what would have otherwise been a natural distinction between indirect valuation and indirect exchange.

Because in primitive societies valuation was applied to everything, indirect valuation must be viewed as being as old as history: Things obtained as gift, or through war, theft and loan would all be subject to valuation, even if in quite crude terms (Homer 1963:18). So would objects of prestige, of use for personal ornament, or of interest for decorative purposes, such as human and animal skulls. Some of these often developed into a kind of currency (Einzig 1948:378). Malinowski and others showed that the same considerations apply to objects of religious or ceremonial significance (Einzig 1948:379).

Either one has to assume that these various objects stood in no relation of relative worth to one another or to conclude that such relations existed, both directly and indirectly. The latter is supported by the observation that without the tacit knowledge of these relations on the part of the members of the community it is difficult to see how the community could carry on relatively free from internal conflict and strife as transactions were made or various obligations honored. *The possibility, or rather the indispensability, of emergence of indirect valuation in primitive societies means that a unit of account could have emerged in these communities quite irrespective of the presence or absence of some sort of medium of exchange.*

In certain cases a unit of account may have originated through regular requirements for specific standardized objects for the purpose of sacrifice to deities, payment of penalties for breaking taboos, and establishing compensations for the performers of religious rites (Einzig 1948:380). For example, Laum notes that how much of what was to be sacrificed by a person—in expectation of or in response to blessings from gods—would depend on the nature and urgency of the blessing in question, or those of the wrath to be warded off Laum (1924:23–24), quoted in Einzig (1948:381). He provides substantial support for his thesis that ox emerged as a unit of account not on the basis of trade, but of religion Laum (1924:13) quoted in Einzig (1948:372).¹⁴ The ox that served as a Unit of Account gradually ceased to be a concrete animal, but one that possessed a certain set of specified characteristics regarding its health, weight, age, etc. In other words, it evolved into an abstract, standard ox, fit to serve as a unit of account.

In ancient Greece, India, and elsewhere the State authority laid down rules determining the precise quality of the animals suitable for sacrifice, thereby providing early examples of State-guaranteed units of account (Laum 1924:29) quoted in Einzig (1948:382). Because sacrifices were made not only in oxen but also in other animals, as well as in a large variety of tools and implements, all of these had to be evaluated in relation to one another. This was attained by means of reckoning everything in terms of the standard ox (Laum 1924:59–69) quoted in Einzig (1948:382).

In sum, a duty to pay arose in the course of loans in kind, and also as a result of a large number of social and religious factors. Ancient communities were held together by means of a rigid set of rights and duties, which were rooted in and enforced by custom. For many millennia the rights and obligations that arose out of voluntary exchange were, at best, minimal and only on the periphery of the daily life experiences of the individual. Menger and other economists have failed to notice the role of customs and coercion (by the state or religious institutions) in the development of units of account. They have failed to note that voluntary exchange is only one among many circumstances that may lead to the emergence of a duty to pay. But even in this case, as was noted above, it was not indirect exchange but

rather indirect valuation that served as the means for overcoming the problem of the double coincidence of wants.

The significance assigned to the concept and process of impersonal market exchange by Manger and others in relation to the emergence of unit of account is unwarranted. These events began to emerge quite late in human history, and only after units of account had already been developed on the basis of credit transactions carried out over the course of several millennia.

A duty to pay is one side of a relationship of which a right to receive constitutes the other. The relationship itself may be referred to as either a credit or a debt relationship. That in primitive communities such relationship arose primarily out of religion and custom, as opposed to formal exchange, should in no way detract from their essential content as forms of credit relations. Thus credit is as old as history, and resides at the very core of the social mode of existence of man.¹⁵

The above findings lead to the following conclusion: *Units of account evolved in ancient communities not in connection with barter and market exchange, but on the basis of credit relations*, which arose in relation to loans in kind, gifts, religious duties, offerings, ransom and many other factors. Consequently, long before trade began to assume notable proportions, a commodity of account (*numeraire*) and a unit of account (*etalon*) had already developed in each community. And this development was in no way related to an object serving as a medium of exchange, and indeed it predated the latter by several millennia.

The evidence in support of the historical priority of unit of account over medium of exchange is overwhelming. The notion that the two functions developed together in the course of market exchange can be rejected definitively. Separate existence and independent evolution of the two is a matter of irrefutable historical record. And the theoretical analysis provided in this paper explains how the historical events could have not been other than those actually recorded.

10. Historical and Logical Priorities of Unit of Account Over Medium of Exchange

Thus the prevailing view that units of accounts developed as byproducts of market exchange, and on the basis of the exigencies of indirect exchange, is without logical and historical foundation. Even in modern times the two aspects have at times stood separately and independently from one another. On numerous occasions in recent history—whenever the medium of exchange in use in a particular community has ceased to have a stable value—the unit-of-account and medium-of-exchange have separated into independent functions.

For example, in the course of the German hyperinflation that followed World War I, businesses often marked up their prices several times a day (Kemmerer 1934:84). Thus the Mark lost its unit-of-account function but continued to be accepted as the medium of exchange. And again, during the inflation that followed the 1979 revolution in Iran, some shopkeepers started the practice of quoting their product prices in terms of the U.S. dollar. In the meantime they continued to accept, in *toumans* (the local currency), the equivalent of the dollar price of their goods, basing their calculation on the day's black-market rate of

exchange between the two currencies.¹⁶ A similar phenomenon has been observed widely in many parts of the world, including Turkey, Russia, Eastern Europe, Latin American countries, and Indonesia.

Numerous private and public loans issued in Germany in 1922–3 were based on the price of various commodities: wheat, coal, lumber and others. In one instance, a loan of 200,000 kilograms of flax was issued, the interest for which was payable in Marks according to the market price of flax at the time when payments were due (Einzig 1948:308).

Only at a later phase of the said inflationary episode in Germany did the mark cease to function as the exclusive medium of exchange. At this stage some sort of fictitious money called “barter unit” came to be adopted in Berlin and other major cities. The price of everything in the market was fixed in such units. Cigarettes, evaluated in terms of their barter units, began to serve as a “residual” medium of exchange: They changed hands for balancing exchanges in the cases where the amounts exchanged were of unequal values (Einzig 1948:309).

Cases of payment systems relying on abstract *etalon* is not as rare as it may appear from the above example. Einzig (1948:17) reports of communities that had “fictitious monetary units which are used for measuring values, even though they have no concrete existence at all.” In a large number of cases “the units serving as a standard of value could not possibly have been used as media of exchange.... It is, to say the least, conceivable that some units of account ... were imaginary from the outset.” (Einzig 1948:367). For example, Yap “stone money”—some as large as 20 feet in diameter—having no utility in themselves—serve as money of account.

Based on the above findings it may be concluded that while the unit-of-account aspect of money is essential and indispensable, the medium-of-exchange aspect is incidental and dispensable. While the former is always a definite quantity that is determined in the context of the system of prices, the latter is no more than a mere instrument that can be chosen from an endless variety of objects, and can even cease to exist altogether. The rapidly evolving “digital money” proves this beyond a shadow of doubt.

Thus, far from being historical curiosities, the “fictitious monetary units” just noted point toward the very essence of money, money stripped from all its historical and contingent aspects.

The significance of the findings presented so far in this paper cannot be overstated: *Whereas Walras established (and Keynes fully grasped) the logical priority of the unit of account over the medium-of-exchange concept, anthropologists and historians showed its historical priority. In other words, both in logic and in history, the concept and fact of unit of account is prior to and independent from those of medium of exchange.*

11. Medium of Exchange, Money, and Monetary Instruments

It was noted above that credit (not exchange) served as the ground for the evolution of units of account, and that the latter developed several millennia prior to the emergence of media of exchange. The fact that, between 2400 and 1200 BC in Greece, while metals were in use as media of exchange, ox served as the unit of account, is of great significance to our investigation. Some historians of money—thinking in terms of the preconception that

identifies money with a medium of exchange—have assumed that oxen must have served as a medium of exchange. But this view is negated by the content of an existing ancient document, which refers to the payment of “bronze and gold to the value of 20 oxen” (Homer 1963:32). *This shows that when metals began to serve as media of exchange they themselves were evaluated in terms of a preexisting unit of account. It was only later that they assumed both functions.*

Use of metals as media of exchange at the same time as ox served as the unit of account carried several advantages of which two are of particular interest to our discussion. First, as noted already, it was not an actual, concrete ox but an abstractly defined one that served as the basis for calculations. This meant that the amount of gold equivalent to, say, a fourth of an ox did not involve conflict and haggling over the kind of ox in question. Second, divisibility of metals would make it possible to carry out all kinds of exchanges involving multiples or fractions of an ox.

When a person sold something worth, say, one fifth of an ox he would receive from the buyer so much gold, which represented command over the goods of the community equivalent to the said amount of the standard (ideal) ox. So long as he did not spend the gold, the said command remained in his possession as credit against the stream of goods and services that is customarily available in the community. This credit amounted to an unconditional, non-terminable option that could be exercised at the person’s will, anywhere, anytime. The only determination that would condition this credit would be its quantity, expressed as so many units of the customary unit of account.

Because the said quantity of gold would serve as a representation and proof of possession of that credit, it functioned as a credit instrument, analogous to the ticket to a play, purchased in advance, and payable in terms of attendance to its performance. The difference between the two instruments—the gold and the ticket—resides only in the basket of the goods against which they may be presented. In one case the basket consists of whatever goods and services are customarily offered for sale within the community, regardless of where, when and by whom. In the other there is a specific service to be received at a specific time in a specific location from a specific obligee. The latter is *concrete*, and the former, *abstract credit*. This observation provides a preview of a definition of money, which will be elaborated in Section 15.

Because characteristic of credit is deferred payment, and because payment in goods constitutes the ultimate mode of payment, so long as a person is not taking possession of the goods, which he is entitled to possess, he is in reality deferring the event of getting paid. Thus in reality he is providing interest-free loans to the community in the form of the goods which he could possess, but prefers not to for the time being.¹⁷

*In sum, a medium of exchange—gold or whatever else—is not money, and money is not a medium of exchange. Money is an abstract right, credit; and any medium of exchange is some specific means (from among many possible ones) for representing that right. It functions merely as a recording instrument, as an evidence that a person has either delivered or has promised to deliver a certain value of goods and services to others. Being a token or representation of money, any medium of exchange—be it shells, beaver skin, gold, paper currency, or demand deposits (electronic or paper-based)—should be viewed as a type of *monetary instrument, not money*, as is usual case. This distinction happens to be of enormous theoretical significance.*

In the absence of the said distinction “money” (implicitly) connotes both the *right that is money*, as well as the *instrument that represents that right*. Such equivocation has proved to be analytically fatal. That, to this day, money continues to be the most written-about, as well as the least understood subject in economics should no longer appear puzzling. Monetary theory has been plagued by a paralyzing deficiency at its very foundation.¹⁸ Distinguishing *money* from *monetary instruments* effectively exposes the root of the error of “thing-mindedness” in monetary economics.

It is true that, aside from the advocates of gold standard, no one insists any longer that money must be a material thing, the notion of “commodity money”. This would be “thing-mindedness” in its purest form. But “thing-mindedness” is present no less when the *thing* called money is currency or demand deposits. As noted already (Section 1) the essence of “thing-mindedness” consists not in its viewing money as a *tangible thing*, but in its inability to conceive of it as an *inherently bipolar category*. *This bipolarity is rooted in the very notion of credit as a relation of right and obligation*; and it manifests itself in every instance of transfer of money whereby at least two accounts are simultaneously debited and credited.

The above clarification should eliminate any suspicion that I have been attacking a straw man of my own making, because presumably no one any longer thinks of money as a (material) thing. But in reality all the writers on money with whose works I am familiar, except for Macleod and Schumpeter, can be shown to have thought of money as a thing (tangible or otherwise). The view that money consists of credit is a radical departure from the accepted concept of money. Mises with his encyclopedic command over the monetary literature of his time brushed aside with scorn any discussion of money along the line of the credit-view, finding in such discussions nothing more than a “claim analogy” (Mises 1953:469–472). And Walras, Wicksell, Keynes, Friedman, Patinkin, and the whole host of the impressive names that contributed to *The Handbook of Monetary Economics* (Friedman and Hahn 1990) invariably viewed money as a thing.

It may be claimed that the modern definition of money cannot be accused of “thing-mindedness” because it asserts that money is a *generally accepted* medium of exchange, and this means that the definition posits money not as a thing, but as a social relation. But could a mere vague allusion to relationality serve as a substitute for a relational view of money? Quibbling over words is futile. At issue is not the question of relationality per se, but relationality in the specific sense noted in the preceding paragraph and throughout this paper. “Relational” in itself is an empty box with no content, a linguistic variable that can assume indefinitely many particular values. The critical question relates not to the term itself but to the meaning assigned to it.

The task of theory construction is not cultivation of equivocations by means of positing abstract terms that allow any number of possible meanings. Rather, for any abstract terms to be of scientific value, its denominations must be determinable. In other words in the duality of connotation and denotation, intension and extension, genus and species, the set and its content (or membership), both aspects of the concept must be coped with. To attend denotation only would lead to empiricism. To provide connotation only would lead to airy flights of imagination above the high clouds of arbitrary abstractions.¹⁹

Returning to the main line of thought in this section, the following may be asserted: Reduced to a mere instrument, the concept of medium-of-exchange is finally dethroned

from the position of supremacy it has usurped in monetary theory. Thus ends a long era of the paradigm of thing-money in all its variants: pre-metallic, metallic, and post-metallic, including its digital version. Money is not a thing, and no thing can be money. In comes the concept that money is a species of credit—and, therefore, a social relation—the information about which can be recorded and transferred by means of a variety of instruments. These may be tangible as with tobacco leaves or gold or intangible like the (paper-based or digital) entries in a bank's ledger.

It is noteworthy that, in the course of their historical development, payment systems have themselves gradually revealed their own essence. Progressively the critical role of information has come to the surface. Money has finally cast off its garment of materiality altogether and has revealed itself as a category of rights. And the payment system has shown itself to be no more than an information system in charge of recording the monetary rights as they get transferred between different account holders due to payments made in connection with exchange of goods and services or meeting of various duties and obligations.

In a sense the theoretical grasp of the nature of money and the payment system by the economist has lagged far behind the historical development of the system itself, and indeed has been driven by it.²⁰

In the light of the foregoing observations, adherence to the medium-of-exchange notion is anachronistic. Were it to be considered unfortunate that formulation of the credit-theory of money has lagged so far behind the actual course of events, it would be even more lamentable if the theory finally put forth were received with less than enthusiasm. But such eventuality is not unlikely. For, as shown by Kuhn and Schumpeter, overcoming the power of an established paradigm is no small task. It may indeed take the coming of a new generation of economists in order to complete the task of ridding the science from the (theoretically) barren notion of medium of exchange, not to mention the prevailing mathematicalism²¹ that has paralyzed the science for more than half a century now.

The foregoing remarks about the critical role of information in the operation of payment systems imply that information processes are inherently and substantially present in any payment system. The next section discusses this idea in detail.

12. From Information to Information

In this section it will be shown that the earliest payment systems in history relied on human memory for keeping track of the rights and obligations (credit relations) that arose, for various reasons, within primitive communities. The varieties of media of exchange that emerged in different communities at different times were instruments that helped record the rights in question, and provide security and proof-of-ownership concerning the rights. From this perspective, any medium of exchange is a monetary instrument. Indeed the terms "medium of exchange" and "monetary instrument" are synonymous.²²

Because money is a species of credit then the nature and origin of monetary instruments can be best understood in the context of the more general process of evolution of credit. It will be seen below that autonomous developments of technologies for recording and transmission of information also have played a significant role in the evolution of the media of exchange.

Primitive communities did not live without money until the emergence of media of exchange. A unit of account and a variety of methods and means of payment—that is, a mechanism for recording, conveying, and transferring monetary rights—already existed from the immemorial past. These varied means constituted the monetary instruments at work in these communities. In so far as these media of exchange related to technical aspects of the payment system, it may be asserted that all the theories that concern themselves with the way in which a medium of exchange can emerge in a particular community are *theories about payment technologies not about money*.

Thus, for example, Menger's "commodity-theory" is, in reality, not a theory of money at all, but rather one that provides a possible explanation of the emergence of some medium of exchange. As such it is a theory of evolution of a *particular payment technology*. Viewed as a theory of money, his analysis is faulty on two fundamental grounds. (1) It confuses the economic category of money with the technical category of payment technology. This is the basis for the false conception already noted in earlier sections, that identifies money with a particular monetary instrument. (2) It fails to formulate the concepts of payment system and payment technology and, therefore, fails to develop a comprehensive view of the evolution of monetary systems.

The technological character of the evolution of payment systems stands out quite transparently in the historical sequence of the events in this area. The monetary instrument initially at work in primitive communities consisted of standing balances of "accounts" recorded and maintained by reliance on human memory. The memory functions went on both at the (intra-cerebral) level of individuals, and at the (inter-cerebral) level of the community with its (historically-accumulated) stock of cultural mores and mechanisms against lapses of memory or fraud.

This was followed by a phase in which people began to use some sort of physical devices for assisting and enhancing human memory functions. At first such various objects as marked sticks, human skull, wampum, animal parts, cowries, and staple goods were used. Later precious metals, goldsmith's warehouse receipts, bills of exchange, notes issued by banks and states, bank deposit accounts recorded on paper, and finally, deposit accounts recorded and maintained by electronic media became the dominant instruments, each supplanting its predecessor(s) in due course.

All this happened in the course of an impressively orderly process of evolution. What is common between these radically different forms of monetary instruments is that they all serve the same two principal ends. (a) As *evidence of possession* of the right to have access to a definite value of the community's stream of goods; and (b) as an *instrument for transferring* such right to another person. It is immaterial what particular instrument is used for giving a gift, paying for a product bought, or meeting an obligation due, be it a tax, a ransom, a rent, or a matured loan. The only thing that matters is that, whatever the mechanism, in every case a definite right is transferred from one person to another.

To recapture the main point: As communities grew and became more complex, their traditional information systems for keeping track of credit transactions—primarily human memory, enhanced by social witnessing and taboos against default—proved increasingly inadequate. People began to rely on certain objects that served, among other things, as aids

to memory in the process of recording and transmitting the required information. *These objects are what economists came to call media of exchange.*

In due time, following a long process of evolution, all the functions that had been performed in earlier times directly and exclusively by human memory, began to get carried out by means of using one or another of the aforementioned objects. These functions included *proof of ownership, security of possession, and means of transfer* of (monetary) rights.

Thus, in line with the results of the preceding sections, pre-metallic and metallic media of exchange were *not money but monetary instruments*. These instruments were in reality particular technologies for recording and transmitting of the information that related to the operation of the payment system. One set of instruments would take the place of another if it performed the requisite functions relatively more efficiently.

Nor could it be said that when human memory kept the required records it constituted money. Money itself is a right, the instrument that represents that right is a monetary instrument. Whether the technicalities of that representation involves brain cells, electronic chips, beaver skin, or whatever else is immaterial to the nature of the problem.

In the case of electronic payment systems the autonomous nature of the impact of technological development on payment systems is quite transparent. The digital payment systems did not arise endogenously on the basis of the internal logic of the payment systems themselves, but rather as a particular application to these systems of the technologies that became available autonomously in the course of the general evolution of Information Technology.

If the nature of the particular media of exchange in use within a given payment community depends on exogenous technological factors, then the concept of medium of exchange cannot be critically significant within the framework of monetary theory. What would be of critical interest to the development of the theory is identification of the invariant substratum that underlies the multiplicity of means and methods of payment and the endless variety of monetary instruments and payment technologies that have emerged at different times and in different places throughout history.

Paying undue attention to the empirical peculiarities of this or that particular medium of exchange cannot lead to significant insights about the nature of money. To the extent that fixation on such technicalities constitutes the very essence of the medium-of-exchange concept of money, this concept is purely empirical.

An empirical concept cannot take the place of a theoretical one. Witness the long-standing impasse in monetary theory? No wonder that the anthropologists engaged in the study of money in primitive societies eventually lost interest in the concept altogether and cast it away as useless, and indeed misleading.

Having adopted the neoclassical concept of money, these investigators looked for and expected to find some sort of medium of exchange wherever they encountered the presence of extensive exchange. It was at first quite puzzling for them, therefore, when they encountered primitive communities in which exchange went on extensively but no medium of exchange could be identified.

Ultimately they discovered that these societies were held together by means of a complex web of reciprocities and a vast array of varied rights and obligations. The different rights and duties were definitely compared to one another, evaluated, and settled through payments. All this went on recurrently and routinely, however, without resort to any thing that could

be identified as a medium of exchange. This led them to suspect that the concept of money adopted from economic theory was perhaps problematic.

But they were not prepared to reject the concept yet and continued to work on its basis for some time. Their eventual rejection of the view that money is an object in favor of the idea that it is an aspect of the web of rights and obligations within a given society became practically unavoidable as their field observations continued to point in this direction. Thus only after their repeated attempts at interpreting their findings on the basis of the medium-of-exchange concept consistently failed to bear convincing results, were they finally ready to abandon the concept altogether.

Although these investigators did not formulate a more workable concept—that was neither their intention nor within their competence—, they did expose the poverty of the definition that identified money with a medium of exchange. Had they been equipped with the concept of money as a species of credit, their field investigations would have undoubtedly confirmed this view even to a greater extent, and in sharper terms than those indicated in Section 9.

Viewing money as a type of social relation, a bipolar entity that involves both rights and obligations, brings to light an essential connection between money and information. Money appeared at the dawn of history as a social relation of rights and obligations, the requisite information about which was recorded and maintained by human memory, language and custom. Next came a long period during which tangible objects of one sort or another were used to operate the information system associated with the payment system. This was followed by a period during which demand deposits became increasingly the dominant form of monetary instrument within the payment stem. Finally at present the world is rapidly moving toward a purely digital payment system which records and transmits the relevant information electronically.

Thanks to the transparency brought about by the dominance of Information Technology within the payment system, money has come out into the open as a species of rights, and nothing but that. The digital payment system and the primitive one that relied on human memory have this in common that they both rely on an information system explicitly, in contrast with the variety of payment systems that came between the two, which do so implicitly. Thus money seems to have completed a full round of the evolutionary spiral. If the story of man is “from dust to dust”, that of money is “from information to information.”

Whereas for a long time the reality of money had hidden itself behind such objects as gold coins and banknotes, with CyberMoney the veil is completely removed and money has come to be seen as it really is. Nor is the significance of information in relation to money limited to what has been said so far: *The concept of unit of account is itself an information concept*. It implies ability on the part of the individual to remember many prices in order to carry out economic calculations.

A cautionary note is in order: Technologists, managers, writers and others involved in the various aspects of the Cyberspace are creating a Cyber-community that is rapidly developing its own language. Terms such as CyberMoney and dozens of others are being coined and popularized by this community daily. The likelihood of false suggestions induced unconsciously by these terms should not be taken lightly. To think of money as electronic pulses (or as information) is no less panphysicalistic²³ than thinking of it as gold or cowries.

It is not the particular objects or mechanisms in use, but the rights represented by them that constitute money.

For the economist there is a happy side to the dominance of Information Technology in the economy. The payment system can now be grasped with relative ease as it can be imagined essentially as a gigantic digital balance sheet, which records and maintains the accounts of the households, firms and other entities. The obligations that arise in connection with the billions of transactions that occur daily in the economy are discharged by means of adjusting the entries on this balance sheet, crediting and debiting the relevant accounts as required. No trace of any material instrument is to be found anywhere within this payment system, not even paper currency or checks. These were the forerunners of electronic means in that in contrast with “commodity money” their material was irrelevant to their value. Only their symbolic content, that is, the information they conveyed, mattered.

In the context of the electronic model of the payment system noted there is no room for misunderstanding the nature of money, because there is no *thing* to be held and handed over to someone else as a means of payment. There are only accounts inside the (imagined) digital social balance sheet. Any change in one account must have its exact balancing changes in one or more other accounts. *All that occurs is transfer of rights.* The reality of money as a species of rights practically forces itself into the mind of the economist. All the mysteries that have surrounded money throughout its long history disappear for good.

The new conception is bound to lead to a new beginning in economic theory, one that is likely to influence the pace and the direction of its development significantly. Among other fields, capital theory may undergo essential reformulation.²⁴ As a result two phenomena, namely, money and capital, which have put up formidable resistance against repeated theoretical attacks in the past will be forced to surrender to analysis.

At the foundation of the new concept of money lies a 900-years old invention: Double entry bookkeeping, which was hailed at the time of its discovery as one of the greatest achievements in human history, is once again going to play a significant role in economics. This time it will serve as the total-system supermodel of the payment system, a model that will make it possible for the mind to grasp the enormous complexity of the economy’s myriad of daily transactions coherently within a unitive frame of reference. Such system-theoretic conception provides a fruitful direction for research and shows that it *is* possible to think meaningfully about money without dragging in all kinds of arbitrary “behavioral equations” and other positivist idiosyncrasies and faddish constructs. Indeed, understanding the nature of money requires parting company with the specious mathematicalism that has been responsible, more than any other factor, for sending monetary theory astray during the 20th century.

The iron necessity of the laws of double-entry accounting will force the economist to recognize that her concept of money and credit must be meaningful not only from the perspective of individual holders of money but from that of the whole economy, even the entire global economy, as well! Every monetary credit extended to a (natural or legal) person necessarily obligates some other person or group of persons to relinquish their immediate rights to goods and services in the community. No amount of sophistry can overcome the logic of double-entry bookkeeping as it is applied to the payment system in its entirety. Such system-theoretic perspective leaves no room for arbitrary manipulations of the monetary

rights of the people by the banks, the state, and the international agencies. The commercial banks, the central banks, IMF, and the World Bank will have to defend themselves against the suspicion that their engagements in arbitrary forging of credit around the world may be acting as the primary causes of instability in the world economy. At the time of this writing²⁵ the events in Russia, Indonesia and Brazil provide only the most visible cases of credit-induced economic disasters around the world. In the absence of theoretical insight into the nature of credit and money periodic occurrences of such events cannot be avoided.

13. Macleod's Credit Theory of Money

H. D. Macleod was the first economist who proposed a Credit Theory of Money. *The Theory of Credit* (Macleod 1893, volumes I and II) constitutes, to date, the only comprehensive and authoritative treatise on the nature of credit and its relation to money. This work provided the detailed exposition of the ideas that had been outlined in his earlier writings, among which *Lectures on Credit and Banking* (1882) is the most noteworthy.

It is unfortunate that to date economists have almost completely ignored these writings.²⁶ Only his *Theory and Practice of Banking* (1892, 1893), which went through many editions, is occasionally referenced in the literature. *The Theory of Credit* is hardly ever mentioned, although it contains by far the most comprehensive and mature expressions of Macleod's ideas.

But Schumpeter, who hardly ever misses anything of importance, in this case too notes the significance of Macleod's contributions. Providing references to the most important of his works, he speaks of him as "an economist of many merits who somehow failed to achieve recognition, or even to be taken seriously, owing to his inability to put his many good ideas in a professionally acceptable form" (Schumpeter 1961:1115).

"Money is only the highest and most general form of credit," writes Macleod (1891:21). This statement contains everything that is required in a definition of money and nothing more. That—due to his amateurish knowledge of economics—Macleod was not able to embed his theory of money within the main body of economic theory should not detract from the epoch making significance of his contributions. He will be remembered as a pioneer and a major figure in the history of monetary thought once this history is rewritten, as it is bound to be, in the light of the credit theory of money.

After a detailed survey of the writings of Henry Thornton, Edmund Burke, John Stuart Mill, Fredrick Bastiat, and several other writers Macleod (1893:75–80) concludes that "money is simply a right, or title, to demand some product or service from some one else. [A person] agrees to accept it [money] in exchange for services he has rendered, because he believes, or he has confidence that he can purchase some satisfaction, which he does require, at any time he pleases. *Money is therefore what is termed credit*" (Macleod 1893, Vol. I, p. 75).²⁷ [Emphasis added. M. M.]

Quoting a "London Merchant, F. Cradocke, in the time of the Commonwealth", Macleod continues: "...*Money itself is nothing but a kind of security* which men receive upon parting with their commodities as a ground of hope or assurance that they shall be repaid in some other commodity. Since no man would either sell or part with any for the best money, but in the hope thereby to procure some other commodity or necessary" (Macleod 1893:75). [Emphasis added. M. M.]

He traces *the concept of money as a security or pledge* back to Aristotle (Macleod 1893:75), and quotes (Macleod 1893:76–77) some remarkable passages from Bishop Berkeley's *Querist*: "Whether the true idea of money as such, be not altogether that of a Ticket or Counter? ... Whether the terms crowns, livre, pound sterling, are not to be considered as exponents or denominations; and whether gold, silver, and paper, are not Tickets and Counters, for reckoning, reconciling, and transferring such denominations? ... Whether power to command the industry of others be not real wealth? And whether money be not in truth Tickets or Tokens, for recording and conveying such power? And whether it be of consequence what material the tokens are made of? ... *Whether all circulation be not alike circulation of credit, whatsoever medium—metal or paper—is employed: and whether gold be any more than credit for so much power?*" [Emphasis added. M. M.]

Macleod (1893:77) quotes Baudeau: "This coined money in circulation ... is a kind of bill of exchange, or order, payable at the will of the bearer."

Thus we may conclude that credit is the *summum genus* of which money is a species. The *differentia* that distinguishes the latter from other forms of credit resides in its being *the most abstract form of credit*, one that is absolutely unconditional and free from all qualifications and restrictions.

While Macleod's works are of utmost significance in relation to the development of a credit theory of money, his economics is a mixed bag. His (value) subjectivism was rigorous and consistent, but he was not at all aware of the concept of marginal utility. It appears that his consistent subjectivism was perhaps rooted in Senior's writings and in no way connected to the works of Menger, Jevons, and Walras.

Nor were his shortcomings limited to these alone. A general evaluation of his economics is not relevant to our present discussion. It is sufficient to note that he was almost completely unaware of the major events that were happening in economic theory during the latter part of the 19th century. This may have served as an even more important factor than the one noted by Schumpeter, mentioned above, as to why his works were not taken seriously by his contemporaries or the later economists.

Notwithstanding certain serious pitfalls in his credit theory of money, and his unfamiliarity with the marginal utility theory,²⁸ Macleod's contributions play a critical role in the development of a unified treatment of the theories of utility and money presented in this paper (Sections 14–15). The theoretical significance of such unification, which had remained unresolved to this day in spite of extensive efforts on the part of many prominent economists, cannot be overestimated. In the next two sections the nature of the problem and its background in economic theory are briefly examined, and some preliminary observations concerning future research in this area are provided. Full treatment of the matter cannot be managed within the scope of this article.

14. Unification of Theories of Utility and Money

Following the marginal-utility breakthrough numerous attempts were made to embed monetary theory within the framework of the utility theory [Mises 1953:97–122 (1912)]. However, to date hardly any progress has been made in the area.²⁹

Referring to the period 1870–1914, Schmpeter (1961:1088) observes that on the whole, “... monetary theory remained in one separate compartment and ‘the theory of value and distribution’ in another... The model of the economic process was essentially a barter model...” (Schmpeter 1961:1088). And Wicksell (1962:18) notes that “in most writings on the theory of value the question of the nature and origin of money prices is almost entirely neglected.” Nor have the modern attempts toward integration of the two fields, such as Patinkin’s, succeeded in producing convincing results (Section 15).

Such lack of progress appears to be rooted in two factors: (1) reliance on a faulty concept of money; and (2) reduction of the subjective theory of value to a mere aspect of itself, namely, the marginal-utility concept. It will be seen below that the two factors are interrelated in a fundamental way. As the first has been analyzed above already, I turn directly to an examination of the second factor.

It appears in retrospect that economists were so highly impressed by the fruitfulness of the concept of marginal utility for explaining product prices that they focused wholly on it and, as a result, lost sight of certain other analytical possibilities that were latent within the notion of subjective value. The critical question is this: does the concept of marginal utility exhaust all the potencies of the subjective theory of value, or are there other significant elements within that theory, which can throw light on certain areas of economic theory? Undoubtedly the latter is the case.

Reduction of subjectivism to marginal utility has proved costly for economic theory. Not only has it aborted some possible advances in capital theory and theory of money but, in addition, it has blocked progress toward unification of these two fields with one another, on the one hand, and with the theories of value and distribution on the other hand. In the present article I am concerned only with the theory of money because, aside from considerations of scope, progress in this area is a *sine qua non* of analytical advances in the other areas mentioned.

To see the nature of the problem we have to go back to the fundamentals: Being a subjective affair, *utility is not an abstract category*, but one that is *person-specific*, and *event-specific*. Thus one can only speak of the utility of a particular thing or event for a particular person at a specific time and place. All things and events that are of consequence to a person are viewed as a source of utility or disutility. An act or event will appear beneficial to a person if it is expected to lead to increase of utility or decrease of disutility; and it will appear costly if it is expected to lead to decrease of utility or increase of disutility. A person chooses her actions by comparing the expected marginal benefits and costs associated with each specific action.

Because a person lives in time and space and directs her diverse interests toward a differentiated world, utility is not a simple, but a multidimensional variable.³⁰ The dimensions relate, among other things, to such concerns as how much of what, where, when, and how certain? These may be referred to as amount-utility, kind-utility, location utility, time-utility, and assurance-utility, respectively. Alternatively expressed, for any given person, utility of a good or service depends on its quality, quantity, location, timing, and the degree of assurance associated with it. I shall refer to these as the Fundamental Dimensions of Utility (FDU).³¹

To appreciate the significance of the concept of *dimensionality of utility* observe that the profitability of any entrepreneur in selling a good or a service to her customers depends

on how well she succeeds in outperforming her competitors in relation to one or more of the FDU. Convenient stores compete with supermarkets along the dimensions of time and location. Big retailer's "unconditional return policy" provides assurance utility, and so on.

It should be noted that whereas FDU applies only to consumers, similar considerations are true of producers. Where a firm sells its output to other firms its profitability depends on how well it outperforms its competitors in serving the customers. Here again the dimensions of quality, quantity, location, timing, and assurance constitute the principal factors with respect to which a firm can act in order to satisfy its customers' expectations. In this case we may speak of the dimensions of (customer) *value* rather than *utility*.

It is therefore necessary to coin a more general term than FDU, namely, the Fundamental Dimensions of Value (FDV). This is not a substitute for but a more general category than the former, in that value would mean utility in case the evaluating person is a consumer, and profitability, in case the evaluator is an entrepreneur. This generalization is critical in relation to the theory of money proposed in this paper.

Economic theory has progressed far in analysis, proceeding separately along each of the FDV. Analysis along the quality and quantity dimensions has made it possible to determine the prices and quantities that emerge in product markets. In such endeavors analytical difficulties have forced the adoption of the strategy of abstracting from time, location and assurance dimensions. These dimensions have been coped with in separate analysis: in capital theory, location theory, and theories of risk and insurance. However, as fruitful and unavoidable as the adoption of this strategy may have been, it should be recognized that it has led to a fragmentation of economic theory. Essential as analysis with respect to each of the dimensions is, a fuller understanding of the actual economic phenomena requires a synthesis of the separate results.

However, quantitative analysis is unlikely to succeed in this respect, because the multidimensional analysis required for the purpose would be too complex, given the present state of the science.³² Qualitative analysis based on the proposed concept of FDV may prove to be the only alternative for the purpose, as it supplies a comprehensive framework within which the category of value may be grasped in its entirety.³³

The resulting comprehensive view of the problem can serve two primary purposes: (1) It can help in bridging the gap between economic theory and the actual working of the economy; and (2) it can open new avenues of research into the nature of the relation between money and prices. I shall pursue only the second of these observations here.

The connection between the theory of value (as stated above) and money is straightforward. Among other things, money relieves a person (or a firm) from the burdens and costs of having to carry large inventories of consumer or producer goods, as the case may be. If money is an abstract right of access to all that is customarily available in an economy, then a person can choose to hold limited, convenient amounts of various goods, relying for the rest on the inventories of specialized traders from which she may replenish her stocks periodically as desired.³⁴

In the absence of money a firm or a consumer would have to carry much greater inventories of the varieties of goods that are expected to be required in the future.³⁵ From the perspective of an individual (consumer or entrepreneur), the costs associated with the latter are considerable. To name a few: a person does not usually know, and often may

even prefer to not have to know, exactly what she may need in, say, a week from now. Enjoying the convenience of remaining unconcerned about the matter is a source of value (i.e. utility or profitability) for her. In the case of services she lacks the very choice of storing them in advance. Also costs of transporting, handling, and storing of goods would be prohibitively high due to lack of specialized skills and facilities, and inefficiencies of small-scale operations. It is important to note that these considerations apply equally to a consumer and an entrepreneur, although for the latter they are of relatively greater significance.

Enormous economies are realized by relying on the market, instead of carrying the required inventories individually. Because, directly or indirectly, all production is production of utility along one or more of the FDV, the laws of large-scale production are applicable as much to production in the service sectors, retailing or otherwise, as to farming, mining, or manufacturing. *The difference lies only in the fact that each line of production enhances utility (or profitability) along a different mix of the FDV.*

That economies of scale enhance efficiencies in the use of plant and equipment, physical handling and storage of inventories, organizational, and human capital, is established knowledge. It does not seem to have been noticed, however, that significant economies are realized also with respect to “circulating capital”. This happens because the stocks of various goods in the economy that are *waiting to be consumed or used up in the production process* would be drastically lower with, compared to without, reliance on the market. But such reliance is possible only due to the presence of money in the economy.

Thus aside from the consideration noted in Section 4, here is another sense in which the distinction between the individual and social perspectives of money becomes significant. Among other considerations, money enables the individual (consumer or entrepreneur) avoid the necessity of carrying large stocks of goods for future consumption or use. This individually motivated factor then serves as the basis for the realization of the kind of money-driven scale economies discussed above. Because treatment of matters related to inventories belong to capital theory proper, this aspect of the discussion cannot be pursued further here. But the analysis already points toward a common ground where theories of utility (and more generally, value), money, and capital may be brought together under one roof.

Returning to the personal perspective, the freedom to postpone having to make decisions about how to use one’s income and wealth until such time as the wants actually arise and become sufficiently known, is itself a source of value (i.e. utility or profitability). This relates to the service of availability recognized by earlier writers in other connections than monetary theory.³⁶ Because among other things, money provides its holder with this service, it must be treated as a good, one that supplies its holder with *choice-value*.³⁷ Being a good, money necessarily falls under the domain of utility theory in general and the law of diminishing marginal utility in particular.³⁸

This result is of enormous analytical interest as it amounts to a *unification of the hitherto separate and unconnected theories of money utility*. Two critical theoretical constructs have made this integration possible. (1) The theory of abstract rights and its connection to money, due to Macleod; and (2) the concept of Fundamental Dimensions of Value, which has existed hitherto *implicitly* in the works of all economists, but has been given a formal and explicit treatment in this paper.

The notion of abstract right is of interest from the perspective of value theory because it relates to the concept of choice-value, that is, freedom from all specificity with respect to one or more particular dimensions of value. An abstract claim in the possession of an individual is the antithesis of one that is specific with respect to *every* possible consideration of interest to her. Restrictions related to *any* of the fundamental dimensions of value (except for the amount) would prevent a claim from being completely abstract and would, therefore, disqualify it from being monetary claim.

An interesting by-product of the foregoing analysis is worth noting. It is now possible to provide the important notion of liquidity with an economic content and to embed it securely within the framework of utility theory: *Liquidity of an asset resides in the choice-value supplied by it to its holder*. Because a monetary claim is free from all conditionality, it supplies its holder with the highest degree of liquidity. Indeed it represents the very embodiment of liquidity, so that all other assets become more or less liquid, depending on the ease with which they may be converted into money.

In this way liquidity assumes the status of a well-defined theoretical concept within the framework of the General Theory of Credit and Money. Having initially emerged in various applied fields on the basis of practical considerations, the concept is now purified from its varied equivocations and can validly enter the domain of exact analysis.

15. Money Defined: A Unified Theory of Money

Rephrasing the foregoing result, money may be defined, from the perspective of an individual, *as a right that provides its holder with choice-value*. This right is recorded by means of some sort of monetary instrument. The latter consists of an unconditionally transferable claim, regardless of the particular form it may assume within a given payment community. Beaver skin, gold, banknote, demand deposit, and the endless variety of other monetary instruments that have been in use at various times and in various places all have one thing in common, namely, their unconditional transferability within the payment community.

In this observation lies the key for the resolution of the paradox that gives money a dual character, making it appear as one thing from the personal perspective and another from the system-theoretic perspective.

In primitive societies, where informal borrowing between the members of a tribe were routine and ubiquitous, credit supplied each individual with choice-value in the same manner as money does in contemporary economies. In this sense money existed from the earliest periods of human history. Given a unit of account, informal credit standing between the members of a community would enable them to engage in exchange without having any difficulties due to the problem of double coincidence of wants. X may get what she wants from Y, paying for it fully or in part, by one of two means. (1) By offering of what she has at the time, which may happen to be of interest to Y. (2) By giving a promise to deliver to Y goods of a definite value in the future.

Thus arise standing "claims" against the existing stocks, and the forthcoming streams of goods and services within the payment community. These claims exist not merely because of past unsettled exchanges. They are not only "debt claims", or claims created *ex post*. They include "credit claims" as well, *i.e.* *ex ante*, potential obligations that a person expects

to be able to issue in favor of others, as occasion arises, in order to get immediate access to the goods belonging to them. This credit is sanctioned by the belief on the part of the person who extends it that the obligee will honor her obligations by some sort of reciprocity in the future. The less specific is such credit with respect to the fundamental dimensions of value the more effectively it functions as money. Thus, when the claim is in terms of so many units of account, payable at anytime in anything that the obligee has (or has claim to), then it is perfectly liquid and can be used for purchasing any good or service within the community.

Note that an obligee can redeem his obligation not only directly but also indirectly by means of transferring a claim he has against a third party in favor of the one to whom he is obligated. In a small community the outstanding rights and obligations may be transferred easily across different persons by verbal instructions, thus making indirect exchange possible. Such indirect transactions enable a particular person to gain access to the whole community's stream of goods and services, even if what he has to offer is of interest to merely a few persons within the community. *In this way transferability of credit could have served as the principal mechanism for overcoming the problem of double coincidence of wants.* This results weakens, to say the least, Menger's thesis to the effect that reliance on an actual commodity is the only way in which the difficulties associated with indirect exchange could have been overcome.

Because exchange implies payment, in each community a payment system must have evolved along with the system of exchange of goods and services. A possible (and perhaps the most natural) payment system would be one that operates on the basis of transferability of credit.

The importance of transferable credit justifies a closer examination of the subject. Observe that a concert ticket purchased a month in advance, a postage stamp in a person's drawer, and a food stamp are all varieties of credit instruments. In the hands of their holders they all constitute rights to receive satisfaction from certain agencies that are obligated or willing to deliver it.

How are the rights associated with these various credit instruments different from money? In certain cases they are not. For a person who intends to mail a letter the stamp is as good as money. And similar considerations apply to the other two cases mentioned. But, in general, people prefer money to such specific claims. For example food stamps sell at a deep discount in the underground market. The reason is obvious. *Money is a general claim* against the stream of customary goods and services of a community, whatever the goods and whoever the person in possession of the goods. In other words money is a type of right that provides its holder with unconditional choice, and therefore, with the highest degree of choic-value. It provides its holder with complete freedom of allocation of the resource across the different FDV's. Every credit instrument that is conditioned and restricted along one or more of these dimensions is, for that reason, not a monetary instrument. Thus, transferability of any credit suffices for transforming it into a general (monetary) claim.

Transferability of rights was not only present in smaller communities of early history and medieval times. It was practiced widely during the late medieval period and well into the modern era within the community of merchants who dealt with one another recurrently. This extended even across national boundaries as trust and mutual dependence developed

between individual merchants from different nations. In this way negotiable instruments emerged on the basis of the customs and practices of merchants long before the legal concepts associated with them were formulated and appropriate laws that regulated their circulation were instituted.

Whether transferability of rights is implemented by the instrumentality of human memory or involves some tangible device such as cowries, gold, a widely accepted bill of exchange before it matures, banknotes, or central bank notes is quite incidental and unrelated to the essence of the problem. *Because anything that is potentially available for sale necessarily belongs to someone somewhere within the payment community, unconditional transferability of credit constitutes the necessary and sufficient conditions for the emergence of abstract credit.* By definition a transferable credit is a right which may be exercised at any time, anywhere, against anything or anyone who offers things for sale. Transferable credit is socialized credit.

This line of reasoning leads to a surprisingly concise definition of money: *Money is unconditionally transferable credit.*³⁹

Unconditionally transferable credit has a dual function. On the one hand it transforms any specific credit into abstract credit, and by this reason it becomes an inherent aspect of the personal view of money. But because it is also the principal factor that transforms credit from a bilateral to a social category it supplies the key to the understanding of the system-theoretic side of money. It follows that the personal and the system-theoretic perspectives of money are not disconnected but rather constitute the separate moments of the same theoretical notion. In this sense the theory presented may be referred to as a Unified Theory of Money.

It appears, therefore, that we have been led to formulate two distinct and competing definitions of money: (1) Money is a good that supplies its holder with unconditional choice-value; and (2) money is unconditionally transferable credit.

A closer examination reveals, however, that the latter contains and implies the former! An unconditionally transferable claim necessarily supplies its holder with unconditional choice-value. Thus only one of the two definitions stated is fundamental, and the other one is derived from it.

It may be noted, therefore, that defining money as unconditionally transferable credit resolves the long-standing apparent paradox that pictures money as having a dual character (Section 4), related to the perspectives of the individual and that of the payment community as a whole.

A few additional remarks may help clarify the relation of the idea of transferable credit with the theory of value. *Money is the most abstract form of credit that exists at any given time within a payment community.* It is a socially sanctioned right to the goods and services within the community, one that is unconditional as to where, when, against what or whom it may be exercised. It is thus an undated (non-terminable) option right, which may be exercised against the community's stream of goods and services at the pleasure of its holder. This is the meaning of the aforementioned remarks by Walras and others that money is a bill-of-exchange drawn on the community's goods and services. Whether money is represented by wampum, banknote, demand deposit, or gold coin in no way affects its meaning as a standing, as yet unexercised right, a claim

waiting to be exercised unconditionally, at the option of its holder, against the community's resources.

No other species of credit can constitute money because presumably the criterion of its being a different species consists of the presence of one or more restriction as to the ways in which the right may be exercised. Such restrictions amount to the imposition of one or more conditions on the absolute freedom of the individual to use her right to obtain goods and services as she pleases. In sum, by virtue of its unconditional transferability, money provides its holder with maximum degree of choice-value.

It may be noted in passing that the definition of money as transferable credit casts doubt on the validity of the notion of money substitute. Money is the very apex of the process of evolution of credit. All but the most unconditioned form of credit is to be classified as non-money, not as "money substitute". The notions of "money substitute", "near money", "fiduciary media", M1, M2, etc. are all spurious. They are interesting only because they illustrate, quite graphically, the long-standing and still-ongoing confusion about the nature of money.⁴⁰

To proceed with the analysis it is now necessary to ask, what are the principal components of a payment system implied in the foregoing discussion?

16. The Two Components of any Payment System

Any payment system has only two principal components, namely, (1) a unit of account, and (2) an information system that would record and convey the rights and obligations that arise in connection with voluntary exchange, gift, or coercion (legal or illegal).

What the nature of the information system is, how the promises are made and believed, how trusts are extended and sanctioned, how the rights and obligations are recorded and made effective, these are not economic issues, but cultural, technical and legal matters of great interest to the economist. The laws and customs that create, modify, and regulate the monetary institutions, and the variety of means and methods that serve as media of exchange influence, and are in turn influenced by economic laws. But these cultural, legal and technical factors follow the logic of development of anthropology, jurisprudence, and physical and engineering sciences, respectively and, strictly speaking, fall outside the domain of economic analysis proper. A few remarks may be made, however, in order to highlight those aspects of these issues that relate to the focus of interest in this paper.

The Information System at work in the primitive payment system discussed in the preceding sections ran on the basis of human memory and speech, enhanced by the cultural device of social witnessing. Custom and tradition as well as the prevailing concepts and rules of justice and equity in the community would tend to reduce the incidents of fraud and default.

It is not difficult to design a physical analogue for this memory-based payment system. Suppose that abacus-like devices, are kept in a community's temple—one for each family—and priests use these to record the credits and debits that arise as a result of transactions between different parties to any transaction. Beads would be moved from one account to another for payments, and dated debits and credits (related to lending and borrowing) would be represented by different colors than those used for representing current

rights and obligations. Transferability of rights and obligations would enable a person in possession of something of interest to others to purchase goods and services from virtually any other person in the community. Everything that was possible within the memory-based payment system can be done now by this system of colored beads as well. They are both information systems. They differ in the technicalities of recording the relevant information.

The beads provide certain extra-cerebral, symbolic means as “external devices” to assist the intra-cerebral memory functions. By itself this is not a unique phenomenon, as it provides merely an instance of the general tendency of man to rely on tools. Just as levers are used to amplify muscular function, memory devices of one sort or another may be used to enhance the brain functions.

If the priests invent more abstract symbols, such as markings on wooden sticks or clay tablets, in order to keep track of debits and credits, the nature of the process would not change in any fundamental way. Only the medium of recording the information would, bringing the system into closer resemblance to the bookkeeping system of a modern bank.

As another example, suppose that in a frontier area the owner of a general store, Smith, prices his goods in terms of what he calls the Smithy, which consists of a specially stamped leather token he produces himself. Assume that he proceeds to buy goods from the settlers by paying Smithies and stands ready to accept these when selling goods to them.

If a person sells some goods to Smith, the value of which in Smithies exceeds the value of what he cares to purchase from the store at the time, he receives the difference in Smithies, which he can use for his own future purchases from Smith.

A Smithy in the possession of a person (other than Smith himself) is evidence of credit to her, a right to receive, and of an obligation against Smith. What renders this credit instrument a monetary instrument is the absolute freedom and arbitrariness with which the person can use it to acquire different goods. It can be presented for exchange against any combination of the items in the store’s existing or expected inventory, in any quantitative pattern and at any time during the operating hours. In time Smithies may begin to circulate more widely to serve as means for settling the residual claims that may arise between any two persons in the community who engage in exchange with one another. To the extent that the Smithy may be accepted by more and more people it becomes ever more abstract, ever less burdened with qualifications, conditions and contingencies. Hence it comes to function as a more and more perfect monetary instrument.

What makes, say, a dollar bill different from a Smithy is only this: a person in possession of a dollar bill would have the opportunity to purchase goods from a much larger number of suppliers. In other words the difference is not in the nature and quality of the phenomenon in question but merely in the scope and extent of it. Thus a dollar bill would represent credit even more completely than a Smithy. These observations support the validity of Bishop Berkeley’s concept that all circulation is circulation of credit, whatsoever the medium employed.

Note that, to its holder, a Smithy is not *credit* but an evidence of possession of credit, a *credit instrument*. As noted already, this distinction is of utmost theoretical significance. Similarly, a *dollar bill is not money but a monetary instrument*. The same may be said of gold (under gold standard), of paper currency issued by banks or the state or, indeed, of any “medium of exchange”, whatever its form, demand deposits included. Each of these is a

particular representation of money, which assumes its monetary function from the specific nexus of historical and institutional factors that gives it the meaning of money. In contrast *money itself is that meaning, i.e. the power to command goods and services in the possession of others*. This right is initially obtained through exchange, borrowing, coercion or gift.

It may be objected that Smithies are obligations of a particular person, Smith, but in contrast a dollar bill, though accepted by everyone, is not any specific person's obligation. This is a valid point. But it creates no serious difficulties. A monetary instrument is not just any credit instrument, but the most abstract species of such instruments. Contrary to, say, a bill of lading, which is a good-specific, obligee-specific claim, a dollar bill is an absolutely unconditional, abstract, and arbitrary claim. It is fungible par excellence. By being freed from the condition of who the obligee is—by shedding the restriction of specificity of the obligee—a given abstract claim (right) would acquire the highest degree of abstractness, one without which it would not be a perfect monetary instrument.

The question may be viewed from a different angle: The obligation side of the right represented by a dollar bill is not a legal but an economic category. Perhaps the word obligation does not do justice to the meaning that emerges from the foregoing analysis. But the problem cannot be resolved within the scope of the present discussion.

The question relates to a more general problem that falls on the borderline between law and economics. Often certain types of property rights remain undefined or ill-defined because the situation in question is beclouded by the complexities of economic phenomena. A case in point is the concept of property rights in money. Because this relates to the kind of concerns that has occupied the interests of many economists, specially those in the Austrian tradition, the next section provides a preliminary outline of this subject.

17. Property Rights in Money and the Concept of Monetary Externalities

The fact that the right called money (represented by a monetary instrument) is not against any specific person but against the entire community has prevented the development of proper concepts of property rights in this area. Consequently the concept of *property right in money* in the system-theoretic sense is not well understood and, therefore, is not recognized in any of the existing systems of jurisprudence. It is due to such conceptual and legal indeterminacy that banks and various states have found it possible to engage in unchallenged credit-forging activities, without they themselves or anyone else even suspecting that this may be causing arbitrary expropriation of certain groups in the society in favor others. There is perhaps no more significant an instance of the necessity of joint effort on the part of legal theorists and economists than this area.

Having identified money as a species of Rights, a significant question arises as to how these Rights may be influenced by factors rooted within the payment system. Thus, for example, to the extent that fractional-reserve banking may be shown to infringe, under certain circumstances, upon the monetary rights of individuals, the activities of the banks may be said to generate external costs within the economy. Because of its pervasive system-wide nature and its potentially large magnitude this type of market failure may require a close scrutiny by economists.

External costs usually exist because the damages inflicted on third parties cannot be traced, inextricably, to their source, or because the property rights in question are not identified or defined with sufficient clarity. Both of these factors are strongly at work in connection with fractional reserve banking.

Although, as with other types of externalities, reference to legal concepts is unavoidable in this area, it should be noted that the problem at hand is fundamentally an economic one, and can be properly understood, therefore, only by means of economic analysis.

Appearance of the concept of Rights in a discourse of monetary economics does not mean that the borderline between economics and jurisprudence becomes blurry here. As “the Science of Rights”, Jurisprudence concerns itself with Rights as such, with their definition, ascertainment, adjudication, interpretation, modes and conditions of transfer, and manners of protection (MacLeod 1893:50). Economics, on the other hand, working (as it does) within an existing legal framework, is *not* concerned with Rights as such, but with *motives for and consequences of transactions in rights*, which arise in connection with exchange or other circumstances that result in a duty to pay.

Ignoring gift, force or fraud, a person’s right to command a definite value of goods—her purchasing power—can originate only from (1) having delivered, or (2) being expected to deliver, goods and services to others. The latter is the basis for a person’s credit. By borrowing, a person obtains the right to draw more from the flow of goods than the amount she contributes concurrently. Should another person, a lender, voluntarily give up her rights of the same value for the term of the loan obtained by the said borrower, both persons would be better off, and the monetary process at work is economically efficient.

Thus lending-borrowing is an act of exchange, not of goods, but of the rights to goods. Such inter-temporal transfer of rights to goods constitutes the essence of any credit transaction. Being a voluntary transaction between two persons, such exchange is not only *economically efficient but also legally proper*. Any deviation from this *principle of voluntarism* would amount to a violation of some fundamental principle of Law, Economics, or both. The theoretical significance of this observation is that it provides a *definitive criterion for evaluation of payment systems*. Such criterion has been absent in monetary economics until now.

Evolution of economic institutions, payment systems included, is driven by economic calculations of individuals. Because, generally speaking, the abilities and preferences of individual lenders and borrowers with respect to the magnitude and term-structure of loans do not match, specialized institutions, namely, financial intermediaries, have evolved, which pool the stream of savings and re-apportion them to qualified borrowers in desired packages. In this way the problem of double coincidence of wants related to lending and borrowing is overcome. Consequently, capital is mobilized, and is allocated efficiently, to an incomparably greater extent than would have been possible, had individual lenders and borrowers relied on direct transactions with one another.

However, the meaning of the term financial intermediary has been extended arbitrarily (in the literature of money and banking) to include another institution as well, namely, a commercial bank. This is misleading because, whereas it is true that a bank functions as a financial intermediary in its savings department, in its demand deposit department it

engages in a very different kind of activity, namely, fractional-reserve banking. Blurring the distinction between these two essentially different activities has far-reaching detrimental consequences for monetary theory.

Whereas the total value of the liabilities (to non-owners) issued by financial intermediaries exactly equals the total value of the savings of the depositors, the value of those issued by banks (engaged in fractional-reserve practices) exceed that of the amounts provided by the depositors. This means that, whereas the former provide their borrowing customers with currently-exercisable Rights to Goods only to the extent that such Rights have been voluntarily relinquished by others, the latter violate this equation, and issue Rights in excess of those given up by others.

But the immutable laws of double-entry accounting make it inevitable that by the exact amount in which certain Rights are generated by the actions of banks other Rights existing within the payment system be relinquished, if not voluntarily then by the force of the operations of the price system. Economists have known for quite some time that, in the absence of counteracting factors, such excess of the value of the Rights issued over the Rights relinquished necessarily manifests itself in price increases, which in turn cause “forced saving”.

The term “forced saving”, appears appropriate from the perspective of fiscal activism. Here the planner is interested only in the realization of a certain amount of “saving” at the macro-level and is not concerned with the questions of equity or economic efficiency. That such “saving” is forced, and therefore involuntary, neither should, nor usually does bother the social-engineer type of mind.

However, from the viewpoint of praxeology, in so far as the word saving implies a conscious, voluntary act, “forced saving” constitutes a contradiction in terms, because the notions of voluntary action and forced action mutually exclude one another. Monetary expropriation is a better term.

But even “monetary expropriation” fails to reflect the reality of the phenomenon. This is so because whereas, being open and direct, other forms of expropriation can at least be seen for what they are, “forced saving” operates as a *hidden* and *arbitrary* cause of transfer of income and wealth against certain groups in the society in favor of others. Victims of monetary expropriation cannot understand the nature, extent, time profile, or source of their plights. It is doubtful, however, that many economists would find the term “monetary expropriation” appropriate for analytical purposes. It seems advisable that the term “forced saving” be abandoned instead in favor of “monetary externality”. The latter is free from emotional overtones, and is also more convenient as a means for establishing the required analytical link between externality theory and theory of money.

18. Monetary Externalities Defined

In addition to equity considerations associated with the process of “forced saving”, a matter related to the personal aspect of money, fractional reserve banking leads to several difficulties from the system-theoretic viewpoint, of which only two will be discussed briefly. (1) It leads to misallocation of resources; and (2) it causes instability in the level of employment and output, at times bringing the economy to the brink of total paralysis. For future reference

these three types of external costs may be called, respectively, distributive, allocative, and system-stability inefficiencies. Collectively they will be referred to as *monetary externalities*. These constitute external costs in the sense that they do not impinge directly on the agencies that cause them—the banking system in conjunction with the state—but on others in the society.

Because the scope and magnitude of monetary externalities can be (and on many occasions have been) quite enormous, to the extent that they may be linked, conclusively, to the actions of the banks and the state, in principle these agencies may be held liable for damages. Considerations related to the conditions for translating this principle into action is a matter of interest to law and politics. The economist's job is completed once the nature of the phenomenon has been laid bare.

Due to the intricacies of price phenomena, clarification of the nature of property rights in money may require some groundbreaking work in legal theory.⁴¹ The likelihood of such development will be higher, the better the monetary economists succeed in supplying a clear analysis of the nature of the problem and of its principal ramifications.

As long as money is viewed as a thing, as in the medium-of-exchange paradigm, the problematic nature of fractional reserve banking and “money creation” by the banks and the state cannot be envisioned with sufficient clarity. In contrast, because money viewed as credit is a Right, and a right cannot be transferred without having existed in the first place, a question arises as to the origin of the (monetary) rights issued by the banks. This view of the matter exposes the problematic nature of the concept and practice of “money creation” with great clarity.

Such conceptual clarity is a precondition of any meaningful search for solutions to the problem. It would be premature at this stage, however, to focus on remedies. The proposed framework is only a beginning, merely a new point of departure. Only after it passes through the sieve of criticism, and after its many ramifications are worked out would it be possible to move toward policy questions with confidence.

Within the limits of theoretical discourse, however, this much may be said without reservation: Given the fundamental differences noted in the nature of the operations of financial intermediaries and fractional-reserve banks, it would be misleading to call them both by the same name. In so far as banks and certain related government agencies issue monetary instruments which provide the recipients with monetary rights, without concurrent occurrence of voluntary relinquishment of such rights elsewhere within the payment system, it would be misleading to call these organizations financial intermediaries. “Money-forging” or “credit-forging” institutions would be more appropriate names.

It may appear that the foregoing analysis adds little of substance to what has been provided already by the gold-standard theorists in the older literature or in the more contemporary works such as those of Rothbard (1991), Salerno (1982) and Hoppe (1994). But in fact the analysis provides these writers with everything that they require but have hitherto lacked, in order to develop a sound *economic* argument for supporting their policy goals.

Because gold standard theories epitomize the thing-money paradigm, its adherents remain oblivious to the true nature of money and monetary phenomena. They find themselves helpless in the face of the complexities brought about by the rapidly evolving payment

technology. Their focus on a particular monetary instrument, which appears to have served efficiently during a certain period of economic history, has definitely served a useful purpose in exposing the most obvious of the harms of inflationary policies and practices. But with the availability of the credit-theory of money their continued adherence to Gold Standard would be anachronistic.

These theorists should welcome any analytical framework, such as the one presented in this paper, which would help them disentangle the theoretical and practical parts of their work.⁴² Chances are that some economists, the writer excluded, who, along with Schumpeter, reject “theoretical metallism” as untenable, may be sympathetic toward some sort of “practical metallism” (Schumpeter 1961:289–290).

Though a detailed discussion of this topic has to wait for a different occasion, two remarks may be made in cursory terms: Strictly speaking, an economist cannot enter into a discourse on the nature of justice and equity. She can only expose the kind of inequities that may result from a certain economic phenomena. A legal analyst is able to analyze the rights and wrongs in question and to work toward remedies. And again, an economist can expose how monetary externalities emerge as a result of the operation of political forces within the society. But she cannot enter into an analysis of the nature of the political actions of interest groups that may be aiming, say, at the manipulation of the payment system in their own favor. To do otherwise would require resort to non-economic concepts and methods.

These are the factors that paralyze the gold-standard theorists in their tracks. They fail to distinguish properly between the practical and theoretical aspects of their work. The legal, political, and economic factors that are at work within the payment system remain for them an entangled, and, therefore, pre-analytical, complex of elements.

Furthermore, these writers are at fault because their position implies that there may be exceptions to the operation of the fundamental economic laws that drive the evolution of technology. As shown in Sections 9–11, any “commodity money” such as gold is essentially a means for recording the monetary rights and obligations that arise within a payment community. Gold was superseded by “deposit banking”⁴³ because the latter could provide payment services at enormously lower *apparent cost*.⁴⁴ And the same holds true with respect to the impact of Information Technology on the payment system. No amount of lamentation over the passage of a supposed golden age can reverse this historical event. Gold standard advocates would do well to abandon their nostalgic attachments to the latter and turn to the study of the digitized global payment system. They will discover that the ends they value most are attainable more effectively by following this course as their analysis becomes more consistent, general and robust.

19. Summary and Conclusions

The accelerating transformation of the payment system due to the impact of Information Technology (IT) has brought about monetary phenomena and policy issues that cannot be properly analyzed by means of the traditional concepts of monetary economics. The emerging digitized payment system is of theoretical interest to the economist because it reveals the nature of the relations between credit and money more transparently than was

ever the case with the earlier systems. This provides an opportunity for a fresh start in the investigation of the nature and origin of money.

Fortunately, foundational works by Walras and a virtually unknown 19th century economist, Macleod, have already provided the critical elements of interest for this line of investigation. Building on the Walrasian *numeraire* and *etalon* concepts and Macleod's credit view of money, this paper proposes that money is a species of credit. This implies that money is not a thing, as suggested by the traditional view, but a social relation. What the traditional view calls money, is in reality not money but a monetary instrument. This distinction is critical in relation to the objective of understanding the nature of money.

Monetary instruments reflect the technical side of a payment system, and by themselves cannot reveal anything about the nature of money. Whether a particular system is based on gold, inconvertible banknote, "fiat money", fractional-reserve banking or whatever else, is of little significance in relation to the said objective. Of interest in this regard is only those aspects of payment systems which are present regardless of the particularities associated with any set of monetary instruments that may be in use at a given time and place.

All payment systems are essentially information systems that carry out the following two functions more or less efficiently, depending on the nature of the rules that define them and the mechanisms involved in their operations:

- (1) Recording of the (monetary) rights of the paying and receiving parties within the payment community.
- (2) Providing mechanisms for transferring these rights between the parties to a transaction in accordance with their understanding or contracts.

That these are the *necessary and sufficient elements for the existence and operation of any payment system* can be seen rather easily in the case of a system in which all payments are made by (paper or electronic) checks. But it is shown in this paper that *all payment systems are in essence information systems* with the above two functions. This fact, not grasped so easily when the monetary instruments in use consist of tangible objects, may be seen quite clearly in the case of an exclusively electronic payment system.

Because the theory proposed in this paper applies to any and all actual or conceivable payment systems, it is called a general Theory of Credit and Money.

From the standpoint of this theory, a medium of exchange, whatever its form, is (not money but) merely a monetary instrument. Consequently, the definition that money is "anything that serves as a medium of exchange" is found to be devoid of analytical content. Menger's explanation of emergence of money is not a theory of money at all but a theory of evolution of a particular type of monetary instrument, namely, "commodity money."

This paper shows that units of account developed on the basis of credit transactions several millennia prior to the emergence of media of exchange. Payment systems operating without the latter have been documented extensively by ethnological studies. This provides a second reason why Menger's theory is of little significance in relation to the explanation of the nature of money. If money existed prior to the appearance of "commodity money," then an explanation of how the latter emerged is irrelevant to the explanation of how money

evolved. Money is not any one of the diverse things that have served as media of exchange (or monetary instruments), but rather the permanent substratum of all of them, namely, the right represented, recorded and transferred by them.

Individuals—consumers or entrepreneurs—treat a monetary instrument as though it were a good. They are oblivious to the nature of the payment system. The latter is a matter of concern for economic theory and policy. But economic theory is interested also in the individual perspective of money.

Thus for the economist money assumes a dual character, being one thing from the perspective of an individual who holds it, and another from that of the economy as a whole. From the former perspective money is a source of value (utility or profitability) to its holder. It is demanded for the same reason that any other thing is demanded, namely, consideration of utility or profitability. The difference between money and any other thing of value to a person lies only in the kind of value that is supplied by each of the two.

Holding money provides a person (whether a consumer or an entrepreneur) with what may be called *choice-value*. This is a kind of *service of availability*, which supplies one with freedom of action, including the *freedom to postpone making decisions in advance* as to on what, where, when, and to what extent one would prefer to exercise one's right to the stream of goods within the economy. This *freedom to remain undecided, this prerogative to wait and decide later is a form of value (utility or profitability) uniquely associated with holding money*.

In this paper the term value is used to convey a more general notion than the traditional one, in that it means *not only utility but also profitability*. Just as a thing is of interest to a consumer because it is expected to supply her with a stream of satisfactions in the future, a thing or activity becomes a resource for an entrepreneur because it is expected to contribute to the profitability of her business. Thus “profitability” is used as a technical term, analogous to the way in which the term utility is used.

This notion of value is of critical significance in relation to the concept of money proposed in the paper. Money is used not only by consumers in order to attain their objectives of utility maximization but also by entrepreneurs to carry out their profitability calculations and activities. The so-called “income velocity of money,” which ignores the transactions in intermediary goods and services, has no significance within the proposed framework. Such is the case as well with many other concepts of the traditional view. No attempt is made, however, to provide a critical examination of these concerns, as such a task cannot be managed within the limits of this paper.

A central feature of the aforesaid concept of value is the notion of Fundamental Dimensions of Value (FDV). These relate to the quality, quantity, timing, location and degree of assurance associated with a good or service (of interest to a consumer or an entrepreneur). The significance of FDV for the proposed theory of money is the fact that money differs from other species of credit by virtue of its being *abstract credit*. Some rights, such as that represented by, say, a ticket to a concert, are specific. Money, in contrast, consists of an abstract right, one that is free from any limitation as to against what, where, when, so on, it may be presented as a means of acquiring goods and services. This very consideration, which causes money to be a source of value for the individual, provides also a key to the understanding of money from the perspective of the economy as a whole.

From the system-theoretic perspective money is unconditionally transferable credit. Such unconditionality constitutes a necessary and sufficient condition for transforming any credit into money.

It may seem that two competing definitions of money are put forth in the paper, namely, money as unconditionally transferable credit, and money as an abstract right. In reality the two are related and consistent with one another. Indeed, the former implies the latter. This clarifies the nature of the relation between the individual and the system-theoretic perspectives of money.

This is a happy result because it resolves what has been a puzzling and bothersome problem in economics, namely, the question of the dual character of money. Because the theory presented brings the two sides into a single analytical framework, it may be referred to as a Unified Theory of Money.

On the other hand the idea that holding of money is a source of value (i.e. utility or profitability as the case may be) for an individual puts an end to a long-standing controversy in monetary economics. This relates to the question of whether money itself possesses value, or it is merely a means for obtaining things of value. The definitive answer is that money is valuable because it supplies a unique sort of value, namely, choice value.

This too is a happy result because it amounts to bringing money under the domain of the theory of value. Unification of the theories of money and value has been a major objective in economic theory ever since the 1870's, following the formulation of the Subjective Theory of Value.

Finally, the fact that certain monetary institutions and practices may be less effective than others in assuring that the (monetary) rights held by or transferred between individuals will not be diluted or corrupted over time is a matter of great theoretical and policy interest. This relates to the system-theoretic perspective of money, which focuses on the nature and consequences of the operations of the payment system. Issues related to property rights in money belong to this area.

The notion of monetary externalities is formulated in this connection and three types of monetary external costs are identified, namely, distributive, allocative, and system-stability costs (or inefficiencies). In this way the system-theoretic side of money is subsumed under externality theory. This paves the way for a systematic analysis of a large number of issues, related to money, that have been of interest to economists from the early days of the science to the present.

Because both the personal and the system-theoretic sides of money are assimilated fully within the framework of existing economic theory, money need no longer be considered an outlaw. This paves the way for the subjugation of another outlaw, namely, capital theory. Although the author has not had a chance to investigate this matter systematically, preliminary explorations in this area appear promising.

Clear understanding of the nature and functions of payment systems enables one to identify the sources of the difficulties that have been associated with the existing or past systems. Analysis of the relation between money and credit, on the one hand, and instability of price, output, and employment, on the other hand, is greatly facilitated by the framework presented in this paper. The scope of the paper has not, however, allowed the possibility of making even passing remarks about such matters.

Acknowledgments

I would like to express my appreciation to Professor Leland Yeager whose valuable comments after reviewing an early draft of this paper made a critical difference in its development.

Notes

1. These are not technical niceties but payment means and mechanisms on which major firms are investing significant resources in the expectation of profit. Payments in electronic form were estimated at \$417 trillion in 1991, as compared with only \$70 trillion for paper and check payments, and a mere \$1.7 trillion for payments in currency and coin. (Helleiner 1998:387) More than 90 percent of the volume of payments in the US in 1996 was made by electronic payment methods. And technologies that would bring much of the remaining 10 percent under such methods are either at various stages of market testing, or are already being launched. (Fox 1996:50) Money is now stored (recorded) in and transferred between accounts predominantly as digitally coded information.
2. Strictly speaking, demand deposit is a “monetary instrument” *not* “money.” But it is convenient to yield to the customary usage for now, and to switch to the new terminology in subsequent sections of the paper, following the demonstration of its essential significance. The concept cannot be forced without the risk of causing confusion. By its very nature emergence of linguistic consensus among economists on such foundational grounds as the meaning of the term “money” is expected to be slow and circuitous, rather than rapid and straight. Only in the course of protracted scientific discourse can the new meaning be established and the linguistic habit be modified accordingly.
3. Barren, because economists finally came to agree on the issue, not on the basis of compelling theoretical results, but due to the unmistakable empirical evidence that deposits were carrying out by far the greater share of the payment functions in the economy. The required theoretical reasoning is lacking to this day. And not recognizing such lack compounds the problem because, not knowing what needs to be known is detrimental to the progress of knowledge, just as knowing what needs to be known is conducive to its advance.
4. This is an extremely curious event in the development of the science, because the economists who missed this relatively simple matter proved themselves capable of breaking through seemingly more formidable theoretical barriers in other fields of economic theory.
5. This does not imply that “money is information.” Vulgar phrases similar to this appear quite frequently in the writings of Information-Technology literature related to money. They are all false, amounting to the electronic counterpart of the gold fetishism of gold standard theorists. Money is not a thing; neither gold, nor abstract symbols, be they in written or digital form.
6. It is interesting to note that here Keynes is in essence drawing a distinction between money and monetary instrument, doing so, however, only implicitly and without precision.
7. In line with the discussion in Section 2, and the observation in note 2, a physical object functioning as medium of exchange is not money, but rather a monetary instrument. But because here I describe the view of the matter as seen by the writers noted, use of the term “money” in the old sense is justified.
8. While a provisional outline of this line of development is provided in Section 14, the full treatment of the subject belongs to a separate study.
9. Like Wicksell, Walras provided an accurate description of the method of payment by checks, and noted the dominance of this form of payment over the use of metals. (Walras:364–365). Nevertheless he remained a confirmed metallist: “Gold and silver, by reason of their exceptional qualities, are real, liquid wealth....” (Walras:364–365). Numerous other passages could be quoted in which he expresses his commitment to metallism not by means of analysis but by mere pronouncement of opinion. Only in several aspects of his monetary theory have I noticed such arbitrary departures from the otherwise flawless mode of analysis that characterizes Walras’s writings. This provides yet another testimony to the power of the paradigm of thing-money.

10. Let this paragraph serve as a cautionary note against any impression that I am making too much of the misconception dubbed “thing-money.”
11. That Mises’s sharp intellect failed to see the rich analytical possibilities that are implicit in this suggestion is a curious event in the history of economic thought. Indeed he took the opposite view and asserted that Schumpeter’s remarks amount to the suggestion of a mere analogy whose construction “does not take us even half-way to any sort of monetary theory that can be expressed in intelligible arguments” (Mises 1953:469–470).
12. This work by Einzig is a very valuable source for ethnographic materials. Davies (1994:14) is quiet right in pointing out the uniqueness and importance of Einzig’s work for economists interested in monetary questions.
13. Historians of science and mathematics have noted that practical interest in land surveys in ancient Egypt, arising out of the periodic floods in the Nile valley, may have acted as an important stimulus for the extensive development of geometry there. But they do not seem to have noticed the possible role of credit transactions in relation to the development of counting and of the idea of non-geometric measurement units, such as weight. For example Bell (1945) in his impressive opus, *The Development of Mathematics*, makes no reference to such matters.
14. Of course there is nothing to prevent one from asserting that in the final analysis all giving and receiving, actual or expected, are forms of trade. But such arbitrary extension in the meaning of the term should be avoided. Otherwise the term will cease to have its usual meaning as conscious, voluntary exchange of products and services between human beings.
15. Anthropologists, sociologists and sociology-minded economists may perhaps perceive an opportunity here for an important line of inquiry suggested by this statement.
16. I have not been able to determine whether the practice was stopped by the actions of the authorities or by the negative response on the part of the customers, many of whom were quite loyal to the revolutionary government.
17. This voluntary holding of money on the part of potential buyers is matched by the voluntary holdings of stocks of goods and the facilities for delivering services on the part of the suppliers of these things. I can only mention in passing here that this line of reasoning opens new avenues for integrating the theories of money and capital.
18. Analysis of the terms of a discourse into their principal distinct components is a precondition of meaningful progress in the subsequent stages of analysis within that discourse. Among all the barriers that block the path of progress of science none are more formidable than those erected by the improper use of language. Because language is the sole and ultimate instrument for thinking, its corruption corrupts, and its purification clarifies thought. The following passage from the preface to the book that founded modern chemistry (Lavoisier 1789, 1952:1) has valuable lessons for economists:

“When I began the following work my only object was to extend and explain more fully the memoir which I read ... on the necessity of reforming and completing the nomenclature of chemistry. While engaged in this employment, I perceived, better than I had ever done before, the justice of the following maxims of Condillac in his *Logic ...* ‘We think only through the medium of words.... The art of reasoning is nothing more than language well arranged.’”

“Thus while I thought myself employed only in forming a nomenclature, and while I proposed to myself nothing more than to improve the chemical language, my work transformed itself by degrees ... into a treatise upon the elements of chemistry”

“The impossibility of separating the nomenclature of a science from the science itself is owing to this, that every branch of physical science must consist of three things: the series of facts which are the objects of the science, the ideas which represents these facts, and the words by which these ideas are expressed.... And, as ideas are preserved and communicated by means of words, it necessarily follows that we cannot improve the language of any science without at the same time improving the science itself; neither can we, on the other hand, improve a science without improving the language or nomenclature which belongs to it....”
19. It is precisely the violation of this methodological tenet that renders much of the fashionable “mathematical” exercises that pose as economic analysis these days useless, not to say harmful.
20. For example, my own long-standing interest in the credit view of money was intensified by the emergence of the issues related to the digitalization of the payment system. And many theoretical questions were clarified for me as I began to think exclusively in terms of a purely digital payment system.

21. I propose the term mathematicalism in line with Mises's highly suggestive terms, physicalism and panphysicalism. By mathematicalism I mean that tendency within the post-1940's economic literature which assumes, usually tacitly, that "if it cannot be said with mathematics, then it cannot be economics." This is yet another of the manifestations of the preposterous methodology of positivism, adoption of which has done such great damage to the theoretical development of economics. My rejection of the silly manifestations of "physics envy" and the deplorable methodological infantilism which I call mathematicalism should not be interpreted to mean opposition on my part to the use of mathematics in economics, where such use may be indispensable or decidedly advantageous. For example who can deny that Walrasian general equilibrium analysis, and its important fruit for monetary theory, namely, the concepts of Unit of Account and Standard Commodity, are lasting and determining contributions to the development of the science? Nonmathematical formulations of such concepts could have not possibly provided the same wealth of connotations, and the same degree of exactitude and determinacy as that provided by the mathematical one.
22. Such isomorphism (which allows a distinction up to the power of renaming the same phenomenon) is not present between the terms "money" and "medium of exchange." Indeed, the essence of the long-standing error concerning the nature and origin of money consists of the false assertion that such isomorphism indeed exists.
23. As stated already in note 22, credit for coining the term "panphysicalism" belongs to Mises.
24. I have a strong intuitive conviction about this, and have made a few passing remarks about it in several places in the paper.
25. 1999–2000.
26. My enthusiasm about Macleod's works should not be misinterpreted. There is much in Macleod's economics that is useless and even plainly wrong. But I am concerned here only with the useful parts, which have been ignored in the literature.
27. In the next few paragraphs I provide a very small sample of these exceedingly interesting materials. The reader is encouraged to refer to the sources cited.
28. The scope of the present article does not permit me to discuss these matters here.
29. The latest serious effort launched in this direction by Patinkin failed to provide substantive results, his claim to the contrary (Patinkin 1965:xxiv) notwithstanding.
30. That is, utility is not a scalar but a vector.
31. No novelty is being presented here. Practically all economists refer to these dimensions informally in their writings as needed. In formal theoretical works, however, as explained below, emphasis on quantification seems to have led to a compartmentalization of each dimension into a separate branch of analysis.
32. Tensors, entities that have vectors as their "indexes," may some day prove useful in this respect. But it would take another Walras with that rare dual competence in mathematics and economics, to explore this matter. Otherwise such effort would tend to degenerate into empty mathematical exercises that pose as economic analysis.
33. The concept as presented here is not fully developed, however, but expanded only to the extent deemed useful for my present purpose. It may be developed advantageously in several directions by analyzing each of the dimensions into sub-dimensions.
34. Note the significant relation implicit in this observation between money and capital. While buyers hold money for the purpose of buying the goods in the possession of the suppliers, the latter hold goods for the purpose of selling them to the buyers against the money in their possession. Is there a determinable relation between the stocks of money and of goods both "waiting" for being thus exchanged? Exploration of this question is likely to prove fruitful for capital theory. This much can be said here: In a Wicksellian pure credit economy such relation is determinate. In a fractional system the relation tends to be systematically distorted, although the general tendency of the economy is in the direction of restoring the said determinate relation.
35. As a child I lived in a small town in Iran, where the ways of life had not changed much from what they had been for centuries. Much of the bread we consumed was baked at home. We had storage facilities for one-year's consumption of flour, cooking oil, rice, pickles, dried fruit, and a great variety of other things. Such life style was looked upon with nostalgic amusement by our relatives who lived in Tehran, on occasions when they came for visits. In the monetized economy of the larger cities life had already become much more market-dependent than what we were experiencing in the rural areas.

36. The notion of “service of availability” holds an important place in Walrasian analysis (1969:214, 315, 319). Unfortunately with the exception of Armen Alchian and Hutt (1939, 1997) this concept has attracted little interest among the modern writers. But neither they, nor any other economist that I am aware of, have applied the concept in the sense used here.
37. The term choice-utility would be more familiar to the reader. But for analytical reasons I need a term that would include the advantages obtainable by a consumer as well as an entrepreneur, related to the kind of choice under discussion. “Choice-value” is used in order to convey this concept. The generality sought here is substantive, because, contrary to the prevailing practice in monetary economics wherein money is treated as though it were used in the firm-to-consumer dealings only, I need to refer to its actual domain of operation so that the firm-to-firm transactions would be included as well.
38. If scope considerations allowed, at this point one could proceed directly toward formulating a theory of demand for money on the basis of the new concepts.
39. Note that, among other things, this implies the existence of a payment community together with its web of customs, laws, written, and unwritten expectations. Perhaps in no other area of economics can the institutional economist present as strong a case as here about the necessity of incorporating customs and institutions explicitly into the analysis.
40. Critique of these concepts requires a separate article, prior to which certain aspects of the materials in the present work must be expanded and clarified further.
41. The traditional methods of *legal* and *equitable* remedies—i.e. *compensatory damages* and *injunctions*, respectively—are of little help in this connection, even though some features of each may suggest useful points of departure. Monetary externality has conceptual affinity with injunction because it can best be viewed as a forward-looking, preventive concern, rather than compensatory. However, injunctions typically relate to situations of “private externalities,” where the scope of the externalities present is quite limited. From the perspective of the scope and extent, monetary externalities have more in common with “public externalities.” Yet it is obvious that the *ex post* nature of the remedies associated with the latter is of little interest in relation to monetary externalities. The legal concepts used in this note can be found in any elementary textbook on law and economics. See, for example, Cooter and Ulen (1997:38–40, 139–142).
42. “I am taking it for granted that theoretical metallism is untenable, i.e. that it is not true that, as a matter of pure logic, money essentially consists in, or must be backed by, a commodity or several commodities whose exchange value as commodities are the logical basis of their value as money.” (Schumpeter 1961:289, footnote). Further on he observes that a person may be quite aware of the pitfalls of theoretical metallism “and yet be a practical metallist.” (Schumpeter 1961:290, Footnote).
43. I put the term “deposit banking” in quotation marks because, as with many other terms in economics, it hides and misguides more than it reveals. The term was justified only when the old giro banks were practicing full-reserve banking.
44. “Apparent” rather than ‘true’ because few, if any, among the public had then (or even have today) any understanding of the nature and scope of the problems associated with fractional reserve banking, which have been identified in this article as monetary externalities. The advocates of gold standard could argue that their system provided payment services at a lower *true* cost compared to fractional reserve banking, and that, therefore, it had the economic justification for surviving as an alternative to its rivals. But praxeology teaches that it is not the true but the perceived costs that enter economic calculation. Because people could not grasp the nature of money, they were not able to understand or appraise the true costs that may have been imposed on them from the side of money.

References

- Bagehot, W. [1906 (1873)] *Lombard Street: A Description of the Money Market*. New York: Charles Scribner's Sons.
- Bell, E. T. (1945) *The Development of Mathematics*. New York: McGraw-Hill.
- Berensten, A. (1998) “Monetary Policy Implications of Digital Money.” *Kyklos*, 51(1) (download from the Internet, August 27, 1999), <http://www.epnet.com/cgi-bin/epwbi...s=10/reccount=102/startrec=21/ft=1>.
- Blaug, M. (1962, 1963) *Economic Theory in Retrospect*. Homewood, Illinois: Richard D. Irwin.

- Campbell, J. (1963) "Who Will Own the Customer? Finding Solutions." *Vital Speeches of the Day*, 63(11) (download from the Internet, June 18, 1999), <http://www.epnet.com/cgi-bin/epwbi...s=10/reccount=102/startrec=31/ft=1>.
- Cooter, R., and Ulen, T. (1997) *Law and Economics*. New York: Addison Wesley.
- Dowd, K. (1998) "Monetary Policy in the 21st Century: An Impossible Task?" *The CATO Journal*, 17(3) (download from the Internet), <http://www.epnet.com/cgi-bin/epwbi...s=10/reccount=102/startrec=21/ft=1>.
- Einzig, P. [1951 (1948)] *Primitive Money*. London: Eyre & Spottiswoode.
- Federal Deposit Insurance Corporation (1996) "Notice of FDIC General Counsel's Opinion." No. 8, FR Doc. 96-19697, filed August 1, 1996 (download from the Internet, January 27, 1999), <http://www.fdic.gov/regulations/lawa/federal/index.html>.
- Fox, J. (1996) "What's New About Digital Cash?" *Fortune* 134(6) (download from the Internet, November 22, 1999), <http://www.epnet.com/cgi-bin/epwbi...s=10/reccount=102/startrec=51/ft=1>.
- Friedman, M. (1956) "The Quantity Theory of Money: A Restatement." In: Friedman, M. (ed.) *Studies in the Quantity Theory of Money*. Chicago: Chicago University Press.
- Friedman, B. M., and Hahn, F. H. (1990) *Handbook of Monetary Economics: Vol. I*. New York: North-Holland.
- Greenspan, A. (1999) Fed's Chair Report to the Senate on Feb 24, 1999. (Live television broadcast.)
- Hall, M. J. B. (1983) *Monetary Policy Since 1971: Conduct and Performance*. London: Macmillan.
- Hayek, F. A. (1952) *The Counter-Revolution of Science: Studies in the Abuse of Reason*. Glencoe, Illinois: The Free Press.
- Helleiner, E. (1998) "Electronic Money: A Challenge to the Sovereign State." *Journal of International Affairs*. Spring 98, 51(2) (download from the Internet, September 12, 1999), <http://www.epnet.com/cgi-bin/epwno...s=10/reccount=140/startrec=21/ft=1>.
- Homer, S. (1963) *A History of Interest Rates*. New Brunswick, NJ: Rutgers University Press.
- Hoppe, H.-H. (1994) "How is Fiat Money Possible? – or, The Devolution of Money and Credit." *Review of Austrian Economics*, 7(2): 49–74.
- Hutt, W. H. [1997 (1939)] *The Theory of Idle Resources*. Indianapolis: Liberty Press.
- Jevons, W. S. (1879) *Money and the Mechanism of Exchange*. New York: D. Appleton.
- Jevons, W. S. (1914) *Elementary Lessons in Logic: Deductive and Inductive*. New York: Macmillan.
- Keynes, John M. [1958 (1934)] *A Treatise on Money*. London: Macmillan.
- Kiotaki, N. (1993) "A Search-Theoretic Approach to Monetary Economics." *American Economic Review*, 83(1): 63–78 (download from the Internet), <http://www.epnet.com/cgi-bin/epwbi...s=10/reccount=102/startrec=101/ft=1>.
- Laum, B. H. (1924) *Geld*. Tübingen. Quoted in Einzig (1948:381).
- Lavisier, A. L. (1789) *Elements of Chemistry*. Reprinted in Hutchins, Robert M. (ed.). (1962) *Great Books of the Western World*. Chicago: Encyclopedia Britannica, Inc.
- Levin, L. (1998) "The Future of Online Banking." (downloaded from the Internet, July 2, 1999), <http://www.microsoft.com/ofc/whatsnew/future.htm>.
- Macleod, H. D. (1882) *Lectures on Credit and Banking*. London: Longmans, Green, and Dyer.
- Macleod, H. D. (1891) *The Elements of Banking*. London: Longmans, Green, and Co.
- Macleod, H. D. (1892, 1893) *Theory and Practice of Banking*. Two vols. fifth ed. London: Longmans, Green, and Co.
- Macleod, H. D. (1893) *The Theory of Credit: Vols. I and II*. London: Longmans, Green, Reader, and Dyer.
- Menger, C. (1892) "The Origin of Money." *The Economic Journal*, vol. 2, pp. 239–55. Translated by C. A. Foley. (downloaded from the Internet on February 17, 1999.) <http://www.ecn.bris.ac.uk/het/menger/money.txt>.
- Mill, J. S. [1987 (1848)] *Principles of Political Economy*. Fairfield, NJ: Augustus M. Kelley.
- Mirowski, P. (1988) *Against Mechanism*. Lanham, Maryland: Rowman and Littlefield.
- Mises, L. von. [1953 (1912)] *The Theory of Money and Credit*. Translated by Batson, H. E. New Haven: Yale University Press.
- Mises, L. von. (1962) *The Ultimate Foundations of Economic Science*. New York: D. Van Nostrand Co., Inc.
- Patinkin, D. (1965) *Money, Interest, and Prices*. New York: Harper and Row.
- Roberds, W. (1997) "What's Really New about the New Forms of Retail Payment?" *Economic Review*. Federal Reserve Bank of Atlanta. 82(1) (download from the Internet), <http://www.epnet.com/fulltext.asp?...20%22digital%20money%22&fuzzyTerm=>.

- Robertson, D. H. (1959) *Money*. Chicago: The University of Chicago Press.
- Rothbard, M. N. (1991) *The Case for a 100 Percent Gold Dollar*. Auburn, AL: Mises Institute.
- Salerno, J. T. (1982) "The Gold Standard: An Analysis of Some Recent Proposals." *Policy Analysis*, 16, CATO Institute.
- Schreft, S. L. (1997) "Looking Forward: The Role for Government in Regulating Electronic Cash." *Economic Review*. Federal Reserve Bank of Kansas City, 4th Quarter, 82(4). Download from the Internet, <http://www.epnet.com/fulltext.asp?...20%22digital%20money%22&fuzzyTerm=>.
- Schumpeter, J. A. (1954) *A History of Economic Analysis*. New York: Oxford University Press.
- Walras, L. [1969 (1926)] *Elements of Pure Economics*. Translated from the 1926 French edition by Jaffe, W. Homewood, Illinois: Richard D. Irwin.
- Wicksell, K. [1946 (1935)] *Lectures on Political Economy. Vol. II: Money*. London: G. Routledge & Sons.
- Wicksell, K. [1962 (1898)] *Interest and Prices*. Originally published in Jena in 1898. New York: Augustus M. Kelly.