1 INTRODUCTION

Money plays an important role in both the Post Keynesian and circuit theory approaches. In the circuit approach, macroeconomic identities and the logic of circular flows are emphasized. In this method, all values are in nominal terms; thus, money is analyzed according to the role it plays in these nominally valued circular flows. In contrast, most Post Keynesians have emphasized money as a stock and have paid particular attention to the impact of rising liquidity preference on circular flows. Some Post Keynesians, however, have also recognized that as all spending must be financed, the money supply must expand endogenously to finance a growing circular flow. In addition, Post Keynesians have tended to pay more attention to individual decision-making than have those who adopt the circuit approach. The most important difference between the two approaches, however, is the treatment of uncertainty. Because Post Keynesians are particularly concerned with *ex ante* decision-making, uncertainty plays a major role in their view. On the other hand, circuitists tend to focus on *ex post* aggregate identities, where uncertainty plays no role. Thus, the different treatments of money in the two approaches can be attributed at least in part to a difference in emphasis over where analysis should begin.

This chapter will address several issues which have not been adequately treated by either approach. First, we will examine the nature of money: what is money, why did money originate, and why is money used? Unfortunately, Post Keynesians have generally taken current financial institutions as given and have failed systematically to examine the nature of money. Next we will compare and contrast credit money, commodity money and fiat money. Both Post Keynesians and circuitists have emphasized that credit money is the most important form of money in capitalist economies, but have not provided an analysis of the reasons for the coexistence of credit money with other forms of money. In our analysis, it will be useful to categorize the development of monetary systems according to five stages. While others have also used a 'stages' approach to analyses of the evolution of the financial system, the approach taken here will be quite different. We will also discuss why all monetary circuits must include interest, and why inclusion of interest necessarily leads to a logic of accumulation. Thus, because money is included in a circular flow, the nominal value of the flow must grow: accumulation must be in money...
form. However, uncertainty provides a role for expectations, which means that accumulation will not be steady; therefore, crises are possible. This analysis will help to synthesize the Post Keynesian and circuit approaches.

2 WHAT IS MONEY?

Money is frequently identified with the physical objects which sometime function as money. Thus, it is sometimes said that ‘gold is money’, or that ‘demand deposits are money’. This then leads to a focus on several of the uses to which these forms of money are put: ‘medium of exchange’; ‘store of value’; and so on. This approach, however, cannot uncover the fundamental characteristics of money and the necessary conditions underlying the development of money, as well as those conditions which induce economic agents to use money. As Schmitt and Greppi (this volume) rightly argue, money plays no important role in orthodox analysis – precisely because orthodoxy has ignored those factors which give rise to the use of money.

Money arises out of a social relation; it exists only in societies which take a specific social form; and it is used only in a world which operates in real, historical time. First, money is debt; it represents one type of contractual liability of one party to another. Money is created as one independent agent delivers something of value today to another independent agent who promises to deliver a well-defined value tomorrow. As such, monetary contracts always exist in historical time and indicate a future obligation in return for something delivered today. Keynes (1982: 252) recognized that money is most importantly a unit of account in which debts are written: ‘Now for most important social and economic purposes what matters is the money of account; for it is the money of account which is the subject of contract’. Later, as will be discussed in a moment, money functions as the means of payment, or means of contractual settlement. As Keynes (1971b, p. 3) argued, ‘Money itself, namely that by delivery of which debt contracts and price contracts are discharged … 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’. This also gives rise to the ‘store of value’ function of money, for money reserves ensure that one has a liquid position, defined as the ability to meet contractual obligations as they come due (Davidson, this volume). Still later, money evolves its ‘medium of exchange’ function as markets are developed.

Such monetary contracts cannot exist unless private property is recognized. As Heinsohn and Steiger (1989: 193) argue, ‘With the establishment of private property, we at once have the elements of a money economy’. In the absence of private property, one may seize objects of value without entering into a contractual obligation to deliver value later. Similarly, independence of agents is essential so that they may enter into such contracts.
Independence of agents also generates existential uncertainty of a form which does not exist in communal societies. Of course, tribal societies and the individual members of these societies face great uncertainty: will nature provide sufficient means of subsistence? Will the neighboring tribe attack this year? Will I be killed by a bear? However, this type of uncertainty is fundamentally different from that faced by the independent agent operating in a private property society. By existential uncertainty, I mean the kind of uncertainty referred to by Keynes:

By ‘uncertain’ knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty; nor is the prospect of a Victory bond being drawn. Or, again, the expectation of life is only slightly uncertain. Even the weather is only moderately uncertain. The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know. (Keynes, 1987: 113–14)

In a communal society, many of the risks are shared, and, in some sense, are calculable. Even the individual risks (will the bear eat me?) are calculable in a probability sense. On the other hand, in a private property economy, the risks are individually borne and are fundamentally uncertain for reasons to be discussed below.

For this reason, monetary contracts, which exist only in private property economies, always involve existential uncertainty.6 The agent who enters into a forward contract that delivers something of value today and accepts a promise of another party to deliver something of value tomorrow cannot know whether the obligation will be met. Neither can he know the hardships he will face by surrendering use of the object during the period of the contract – even if the contractual obligation is met.7 Similarly, the agent who promises to deliver something of value ‘tomorrow’ is uncertain about the hardship he will face in attempting to meet this obligation. Because such contracts entail uncertainty, they always stipulate ‘value today for more value later’. That is, interest is always built into forward contracts. The interest rate will depend on the perception of uncertainty faced by the agent accepting the IOU (Heinsohn and Steiger, 1989).

It may be useful to break the history of the evolution of financial systems into five ‘stages’. This is, of course, merely meant to ease exposition and is not meant to suggest that divisions between actual, historical stages are clear-cut.8 In the first stage, forward contracts include interest, but no universal standard of measure has arisen. In the second stage, a universal equivalent or debt numéraire has been developed, with money emerging as a unit of account. Thus, loans of physical objects may be repaid with other objects valued in money terms. In the third stage, loans may be made directly in the universal equivalent. At this stage, money begins to operate directly as a means of payment and as a medium of exchange. Through the third stage, money is exclusively credit money, created through private, usually institutionalized, credit institutions such as banks. The modern financial system, with its use of financial instruments and derivatives, is the result of such developments. Credit money has replaced commodity money as the universal equivalent used to settle all transactions.
through private forward contracts. In the fourth stage, commodity money is finally developed, while fiat money is developed during the fifth stage. Thus, our modern financial system in which private credit money is made convertible into commodity money or government fiat money, and in which government guarantees and reserves of commodity money or government fiat money back up private credit money, is the result of a long period of evolution.

At first, forward contracts took the form of ‘two bushels of wheat today, for three bushels of wheat at harvest’, or of ‘one cow today, for a calf at the end of each calving season and return of the cow in three years’. In such cases, the value delivered ‘today’ took the form of a physical object and ‘interest’ was often generated by the natural, physical productivity of the object loaned. The owner alienated his property and expected to receive interest to compensate for the uncertainty he now faced regarding loss of use and probability of its return. At this first stage, a money of account had not been developed. Furthermore, forward contracts essentially consisted of a two party, inalienable IOU.

Greater flexibility and lower uncertainty were allowed when contracts came to be written in terms of a universal equivalent during stage two. For example, the first universal equivalent used in monetary contracts appears to have been wheat, and later barley, grain. The reasons for this development are obvious: grain is divisible into convenient units; it is reasonably storable; and it is of fairly uniform quality and size (barley supplanted wheat because its grains were more uniform). Thus, the loan of a cow could be repaid in its wheat equivalent. At this stage, money has developed as a social relation between ‘borrower’ and ‘lender’ measured in terms of a universally recognized measure of social value. Of course, neither cows nor wheat are money – rather, money is the contractual obligation, or IOU, of the borrower who promises to deliver so many units of the universal social measure of value. The physical form of payment may be cows or wheat – but these clearly are not money, for the quantity of these to be delivered will depend upon their monetary value.

Stage three, repayment of debt occurs directly in the form of money functioning as a means of payment. At this stage, monetary IOUs become alienable: they may now circulate among third parties, acting as stores of value and means of payment for individuals unconnected to the forward contract in which the money was created. Finally, as we shall see, loans may be made directly in the form of money – in which one alienates an IOU through a loan to a third party such that the ‘borrower’ accepts an IOU and creates his own IOU.

The functions of money, it is the unit of account function – or the terms in which debts are measured – which was initially of primary importance. This, of course, runs counter to the orthodox story in which money was first used to replace barter. That is, orthodoxy imagines a market economy based on barter into which money was introduced to facilitate exchange (Levine, 1983). Actually, money existed before the development of markets, and barter economies have never existed (except as emergency or temporary behaviour). Indeed, it was the development of the money of account which then led to the development of markets and to the use of money as a medium of exchange.
Money in the Circular Flow

The explanation is fairly simple: as money became the universal measure of value, possession of money (and objects of nominal value) became the socially recognized form of wealth. Accumulation of money—that is, of promises to pay—reduced existential uncertainty and reduced the probability that one would have to borrow from others. Since forward contracts always involve interest, those who issued IOUs would find that their contractual obligations continually grew, while those who held IOUs would find their nominal wealth expanding. If borrowers had issued IOUs to obtain use of a naturally productive object (say, a cow), interest commitments could be met due to nature’s fecundity as long as those who accepted these IOUs wished payment in the form nature provided (say, calves).

For three reasons, however, the development of monetary contracts tended to orient production toward sale on markets: monetary contracts in the form of the universal equivalent provided greater flexibility but also meant that the loan of an object would have to be paid not with the ‘natural’ product, but with the universal equivalent (a cow loan must be repaid in idealized wheat terms); the loan of nonproductive objects (say, beefsteak) would not naturally generate interest, so the borrower was forced to engage in production to meet contractual commitments—which could be met, for example, by producing for market; and, most importantly, those who lost their private property (in some cases, because they were unable to meet debt commitments) could work for money wages to earn the universal equivalent which would purchase necessities on the market.

Thus, the development of monetary debts oriented production toward the market, and the development of a class of property-less workers generated market demand. During this stage, stage three, money came to be used widely as a medium of exchange. With the development of large-scale markets, loans could finally take the form of direct loans of money. That is, rather than loaning an object with use value in exchange for a monetary IOU, loans could take the form of ‘money now for more money later’, in which a third party IOU is loaned as part of a forward contract between two parties. Alternatively, bank ‘intermediation’ becomes possible: a financial institution may make a loan (accept an IOU) by issuing an IOU, used by the ‘borrower’ as a medium of exchange, accepted as payment by a seller. It also means that accumulation of money becomes the supreme goal, with money becoming the ultimate store of value. It is at this stage—with the development of markets and loans of money—that money circulates widely among third parties (those unrelated to the original contract in which the money was created) as the medium of exchange and the means of payment.

As we shall explore in the next section, commodity money was developed in the fourth stage, while fiat money was developed in the fifth stage. This allowed the development of a ‘pyramidal’ financial structure in which forward contracts written in terms of the money of account are settled through the use of money which is issued by parties higher in the pyramid (Foley, 1989). Thus, non-banking firms settle accounts through the use of bank money acting as a means of payment, while banks settle accounts through the use of government fiat money. This does not mean that money as a store of value and as a medium of exchange had not been developed. But the development of IOUs and their use as a store of value and as a medium of exchange either made no significant progress or was not significant.
that non-bank firms cannot create money, or that non-bank money cannot be used as a medium of exchange, means of payment, or store of value. Indeed, bank money and the pyramidal structure based on flat money are relatively recent developments, occurring many dozens of centuries after the development of money as a unit of account, store of value, medium of exchange, and means of payment. It is important to emphasize that money is created as part of a forward contract between two parties, and that it is destroyed when this contract is retired through the use of a third party liability or through the use of commodity and fiat money. The development of the pyramidal structure with the central bank at the apex came much later as a means of dealing with two chronic problems: lack of state purchasing power and instability of a financial system based on private credit money.

3 CREDIT MONEY, COMMODITY MONEY AND FIAT MONEY

In orthodox theory, commodity money is the ‘natural’ form of money. Economic agents discovered they could use shells or other physical objects to reduce transaction costs in exchange. Gradually, for reasons which are not always made clear, commodity money took the universal form of gold and silver coins. The value of this commodity money is supposedly determined by supply and demand; thus, an excess supply of money will cause its price to fall and the money prices of all other commodities to rise. Governments discovered that they could somehow fool the public into accepting debased coin (that is, coins with little gold or silver) or even purely nominal paper money. At this point, governments obtained the ability to issue fiat money — whose nominal value was determined by decree. However, if governments issued too much fiat money, inflation would increase. In other words, while governments could control the nominal quantity of commodity or fiat money, they could not control the real quantity of commodity or fiat money. Finally, credit money is either ignored in orthodox theory, or is treated as credit, which is supposedly fundamentally different from money, and is treated as if its quantity were closely regulated by the quantities of commodity and fiat money. This leads to the formulation of the ‘deposit multiplier’ found in every money and banking text.

In reality, credit money is the ‘natural’ form of money: money as a privately issued IOU. With the development of the money of account, these IOUs were at first denominated in terms of wheat, and later in terms of a precious metal wheat equivalent — but neither wheat nor gold was (or is) money. Money represents a social relation between borrower and lender, the terms of which gradually became standardized according to some universally accepted measure. Much later, during stage four, precious metals were coined to provide a somewhat exogenous source of money in addition to the endogenously generated credit money. Purely nominal coins were an even later development, coming in stage five, long after the development of credit money.
Money in the Circular Flow

As I will discuss below, commodity money was developed, at least in part, to deal with the problem of the possibility of default on credit money. The commodity money would be denominated in the universal unit of account, which evolved out of privately created credit money. Even after the development of commodity money, credit money is still the most important form of money in private property economies, created as loans are made. In such economies, credit money is used as the medium of exchange and as the means of payment (in which third party IOUs are used to settle debts); even where commodity money exists, credit money circulates alongside it. For example, McIntosh finds that in early (1300–1600) England, any two people might build up a number of outstanding debts to each other, as long as goodwill between the individuals remained firm, the balances could go uncollected for years. When the parties chose to settle on an amicable basis, they normally named auditors who totalled all current debts or deliveries and determined the sum which had to be paid to clear the slate. (McIntosh, 1988: 561)

Indeed, virtually all sales were made on the basis of credit money acting as the medium of exchange (McIntosh, 1988: 560). Consumers would later settle accounts with coin, but merchants would use coins only to settle net debts. The evidence shows that debts might be carried for months (and even for years) on the accounts of merchants before being finally settled. Thus, in monetary economies, money is ‘naturally’ credit money, while commodity money represents a ‘special’ form of money.18

It is worth noting that in all cases (Babylonia, Italian city states, Western Europe), ‘deposit banking’ develops after the public has become accustomed to using credit money. For example, banks in Western Europe operated primarily on the basis of banknotes until the nineteenth century, rather than as deposit banks. Knapp (1924) argues that deposit banking cannot evolve until the public has developed the ‘banking habit’, that is, the habit of accepting banknotes. Thus, rather than acting as intermediaries from ‘depositors’ to ‘borrowers’, early banks made ‘loans’ by issuing banknotes; that is, they financed their position in assets by creating liabilities. As I will discuss below, banks would then hold reserves (notes of other banks, assets that could be liquidated quickly, and commodity money) so their reserves could be redeemed. Only later did deposit banking develop, which casts further doubt upon the orthodox story of the development of banking, in which the goldsmith discovers a deposit multiplier based on reserves of commodity money (Wray, 1990).

Government fiat money is in all cases a relatively recent development, coming in stage five, long after the public had become used to credit money. Indeed, throughout history most governments were very limited in their ability to gain purchasing power by issuing fiat money (or, more generally, issuing IOUs). Where government attempts to gain purchasing power by issuing debased coin were met by rising prices, this is evidence that the government had not attained the power to issue fiat money. Neither an increase in the supply of credit money nor an increase in the supply of fiat money leads directly to an increase in prices. When governments use fiat money, they can create it, and it will be accepted because it is accepted. Thus, when governments generate additional money, it becomes quite clear that they have government monopoly power.

I will posit that a government cannot generate additional money until it has this in its interests to do so.

4 MONEY

In orthodox terms, money is considered to have general purchasing power and is used in redress of exchange. Keynesian money, and commodity money, are not considered so. Thus, money is seen as being used in order to reduce uncertainty. However, because of the interest that this aggregate of money does not occur, there are alternative ways of expanding the money supply. Methods will...
When governments are not able to issue fiat money, the value of government money will be determined by the quantity of commodity money embodied within it. This was recognized by Keynes, who argued:

"When ... a coin is no more than a quantity of bullion, of which the stamp may certify the quality and indicate the quantity, [it] ... will not circulate except for its bullion value. In this elementary stage the expedient of debasement is not available. It cannot appear, until with the development of contract the conception of a money of account has emerged, and the coins issued by a state have acquired the character of legal tender and enjoy a cours force as the legal discharge of obligations calculated in this money of account. It is at this stage that money, in the sense in which we understand it, makes its entry into human institutions. (Keynes, 1982: 226)"

Thus, when government money is merely commodity money, debasement cannot generate additional purchasing power as those who sell to the government become quite adept at detecting debasement and merely raise prices in terms of government money.19

I will postpone further discussion of commodity money and of government money until later. The next several sections will focus only on credit money, as this is the important form of money in private property economies.20

4 MONEY, INTEREST AND ACCUMULATION

In orthodox theory, money is traditionally taken to be barren. This is the fundamental reason for its insignificant role in orthodoxy. Attempts to remedy this have generated rather fantastic stories, about the "real" services provided by money in reducing transactions costs, in order to generate ad hoc explanations for its use. Keynes rightly argued that no one in the neo-Classical world would hold money, and correctly identified one of the reasons for the use of money: uncertainty. Thus, in Keynesian theory, money yields liquidity and can never be barren. Indeed, we may go further. Because there is uncertainty, all money contracts must include interest — thus, money is not barren and it yields interest precisely because uncertainty generates liquidity preference.

Because of uncertainty, loans in a private property economy must incorporate interest. This means that accumulation of monetary values is ensured in the aggregate as long as debt contracts are not abrogated. In other words, the existence of monetary contracts ensures nominal economic growth (so long as defaults do not occur) since every loan requires repayment of a larger nominal value. There are always two ways to meet interest commitment: obtain money or expand the nominal value of IOUs held by creditors. Use of either of these methods will require an increase of the total volume of money outstanding.
Over time, specialized institutions evolved to take up private liabilities and government debt and to issue their own liabilities. These institutions would act as 'expert judges' in deciding which liabilities were acceptable; they could reduce risk by specializing in this activity, by diversifying, and by seeking government protection (deposit insurance, lender of last resort intervention, monopoly charters, and so on). In this way, they were able to issue liabilities that paid lower interest than did the liabilities they held as assets. Thus, they would live on the differential between the 'loan' rate of interest and the 'deposit' rate of interest – as long as this differential is positive, their assets would grow faster than their liabilities, so that their net worth would rise.

If money is nothing more than the aggregate volume of outstanding promises to pay, then the rate of growth of the aggregate money supply must be closely related to the interest rate if interest commitments are always met by issuing new IOUs. In a moment, we will clarify this relationship. Even if interest commitments are met by payment of money (third party IOUs) rather than by issuing new IOUs, the rate of growth of the money supply will be related to the interest rate. The reason is quite simple. In order for one economic agent to make payments on outstanding debt, this agent must run a surplus on current account. This means that some other agent must be running a deficit on current account – that is, must be issuing monetary IOUs to finance deficit spending. In order for the first agent to meet interest and principal commitments, the second must issue an equivalent quantity of IOUs – which means that the outstanding money supply is growing at the rate of interest. (We will use a simple model to demonstrate this relationship below.)

The existence of uncertainty leads to interest, which generates a drive to accumulate. Accumulation takes the form of instruments of further accumulation. Because money earns interest, it is one means to further accumulation. However, as markets develop, alternative means to further accumulation develop with an expected return which exceeds that on money. Those who issue IOUs, creating money on which interest is earned, do so increasingly to purchase a variety of assets which are expected to generate net money receipts. That is, one 'borrows' to purchase 'capital' to be used to produce commodities to be sold for money on the market. One would not do so unless the rate of return expected to be generated on 'capital' were greater than the interest to be paid on IOUs to compensate for 'borrower's risk' (the uncertainty faced concerning ability to meet contractual obligations). Thus, the expected return on 'capital' must exceed the contractual return on money in order to induce 'borrowers' to issue the money held by 'lenders'. In Keynes's terminology, due to liquidity preference the expected return on illiquid assets must exceed that on liquid assets. Since money is the most liquid asset, its return sets the standard which must be achieved by the return on all other assets.

Over time, the whole spectrum of interest rates has tended to fall. In prehistoric societies with underdeveloped markets, the rate of interest was closely related to the natural productivity of the objects loaned. However, as markets developed and as loans took the form of 'money now for more money later', the rate of interest on such loans has tended to be lower until it eventually becomes profitless.
interest was released from the fecundity of nature. By stage two, the rate of interest came to represent a premium to compensate for uncertainty. This premium has tended to fall over the centuries as various financial innovations have reduced lender’s risk. As the premium has fallen, the required ‘marginal efficiency of investment’ has fallen as investment is pushed to the point where the ‘marginal efficiency of money’ equals the ‘marginal efficiency of capital’.

5 MONEY IN THE CIRCUIT

Post Keynesians and circuitists alike emphasize the importance of circular flow analysis. Schmitt and Greppi (this volume) argue that neutral accounting reveals the ‘prior existence’ of circular flows – that is, such flows are inherent in monetary economies. Circular flow analysis always has to do with nominal flows, thus, with absolute prices and with sums of money, rather than with relative prices as in general equilibrium analysis. Finally, circular flow analysis is concerned with the creation (not allocation) of macroeconomic values. Even after all financial assets and liabilities are canceled, real quantities of goods and services remain – and these quantities tend to grow over time because circular flows must grow over time, inducing accumulation of means of further production.

An analysis of monetary expenditure and income flows lends itself naturally to a circuit approach. The essence of this approach is the recognition that all market activities involve interconnected balance sheets. It may at first seem paradoxical that money arises only where economic agents attain a level of independence so that each is able to enter into contracts, but that money inexorably links balance sheets so that individual fortunes are always tied to the actions of others. Thus, the seeming independence of individuals in market economies is always illusory: pecuniary activities are always interdependent.

In a non-monetary, non-market society, balance sheets need not interlock. Thus, Robinson Crusoe may pick his coconuts and decide whether to consume or save them with no impact on the balance sheet of Friday. If, however, Crusoe lends four coconuts to Friday today in return for an IOU which promises five coconuts tomorrow, then their fortunes are tied: Crusoe’s surplus equals Friday’s deficit; Friday will not be able to retire his monetary debt unless he is able to generate a surplus tomorrow; and Crusoe’s wealth depends on the fortunes of Friday. In this very simple example, the circuit is ‘closed’ and the money is destroyed if Friday is able to retire his debt and pay the contracted interest. At this point, Crusoe receives the four coconuts originally lent plus a ‘profit’ of one coconut. Thus, when money is destroyed, ‘profits’ are accumulated in non-monetary form. If Friday is not able to do so, his outstanding commitment (which represents the total money supply) will grow at the rate of interest. In this case, the circuit is not closed, but grows instead. Crusoe accumulates wealth in the form of money (Friday’s coconut IOUs) rather than in the form of coconuts.
Once we leave our hypothetical Crusoe society and examine a private property, monetary, capitalist society, the nature of the circuit becomes more complex. It is useful to first examine two subcircuits: the consumption goods circuit and the investment goods circuit. As a first approximation, we may begin with the assumption that all expenditures at the beginning of the period are financed by issues of short-term obligations—that is, by creating money. These issues allow the capitalist to hire labour (and pay for raw materials—which will be ignored since these complicate but do not change the argument). We will also assume that society consists only of these two classes, and that the marginal propensity to consume is one for workers but zero for capitalists. Finally, workers do not own means of production so that their only source of income is wages, while capitalists do not work for wages.

The short-term credit issued by capitalists is equal to the wage bill in the two sectors and equals total spending on the output of the consumption goods sector. Revenues received by capitalists are initially in the form of their short-term credits, and their profits equal the wage bill in the investment goods sector. Receipt of these short-term credits allows the capitalist class as a whole to cancel the debt incurred to produce consumption goods. At this point, the consumption goods subcircuit is 'closed'. Remaining short-term credits received as gross profits are equal to the cost incurred in producing investment goods. If these goods are sold to those capitalists holding short-term credits, then the investment goods subcircuit is also closed as the remaining short-term debt is canceled. In this case, all capitalist profits are realized in the form of physical goods. Alternatively, investment goods purchasers might sell long-term debt to holders of the short-term debt—again, the investment goods subcircuit is closed in the sense that all short-term debt is retired, although outstanding long-term debt equals the value of the investment goods. Again, capitalist profits equal the value of outstanding (long-term) debt, which equals the value of the physical investment goods. Finally, it is possible that those who hold short-term debt refuse to purchase either the investment goods or the long-term debt used to fund positions in physical goods. That is, those who have received profits prefer to hold them in liquid form. In this case, intermediaries may spring up to issue short-term liabilities held by those with high liquidity preference, and to accept the long-term debt issued by those who wish to hold the physical investment goods. In this case, the outstanding short-term debt equals aggregate profits, and the long-term debt, and the value of investment goods.

There are two complications which must be considered: we have ignored interest rates, and we have neglected to consider that production is an ongoing process. The short-term debt which is issued to pay the wage bill is not retired at the end of each production-consumption period. Instead, this short-term debt is continually renewed to allow production to proceed anew. In other words, the stock of outstanding credit is not retired at the end of each period, but is rolled over as a revolving fund of finance. In this way, the aggregate profits which are realized in money, are distributed among capitalists (equal to the wage bill in the investment sector). As Marx, Keynes, (Keynes, 1979, p. 133) argued, in a capitalist economy, accumulation occurs in the form of accumulation occurring over time. This is how the growth and growth of deposits and wages rates rise. If it is the case that monetary liabilities must carry interest, then firms issue enough short-term credits to receive interest. In this way, the circuit is ‘carried on the back of’ a ‘revolving fund of finance’.

We will expand. The short-term liabilities are realized in the form of debt. The short-term liabilities will grow. Given that the price level may begin and end on an arbitrary zero margin of error and 100 per cent full employment, the rate of growth of the debt can be calculated. We will assume a rate of interest of $R_p$. Firms can calculate the rate of interest payments that they can make on the stocks of loans and lines of credit.

\[
L_0 = W_0 + R_p D_0;
\]

As long as the interest rate does not exceed the interest rate on the bank's deposits, the bank is willing to lend. The bank's indebtedness will increase the amount of the wages that it can pay and the bank can lend more bank money.

In the second place, the increase in the wage rate will be a similar argument to...
L. Randall Wray

realized in money form (the short term credits issued to cover the wage bill in the investment sector). As Marx, Keynes and many others have emphasized, the object of production in a capitalist economy is 'to end up with more money than it started with' (Keynes, 1979, p. 89). In other words, the object is to realize profits in money form; accumulation must take the form of monetary accumulation. Monetary accumulation occurs where the circuits are not closed and occurs as the 'revolving fund' is continually renewed and as the volume of short-term credits grows over time. This volume grows for two primary reasons: growth of the wage bill and growth of debt due to interest. The wage bill grows either because nominal wage rates rise or because the volume of employment increases.

In the discussion of the circuit above, we ignored interest charges on outstanding monetary liabilities. As the monetary IOUs issued to finance the wage bill must carry interest, it is apparent that closure of the circuit is not possible unless firms issue enough short-term debt to include interest commitments, and that all received interest income is always spent (for example, on consumption goods). In this way, the circuit can be closed. Alternatively, interest commitments may be 'carried on the books' so that the circuit grows at the rate of interest applied to the 'revolving fund of finance'. This can be shown very easily in the following model.

We will expand the discussion slightly to add a third sector: banks. Banks accept the short-term liabilities of firms (non-bank money) and issue their own short-term liabilities (bank money). As the wage bill grows, bank assets and liabilities will grow. Given a uniform production period (that is, all production processes begin and end on the same dates), a marginal propensity to save out of wages equal to zero, a marginal propensity to buy long-term bonds out of profits equal to one, and 100 per cent financing of the wage bill through the use of bank money, then the rates of growth of bank money and of non-bank liabilities are relatively easy to calculate. We will assume that banks provide deposits $D$ on which they pay an interest rate of $r_p$. Firms create non-bank liabilities $L$ (loans) to finance the wage bill $W$ and interest payments at an interest rate of $r_L$. At the end of period one, the outstanding stocks of loans and deposits are as shown in equations (1) and (2) respectively.

$$L_0 = W_0 + r_LL_0$$

(1)

$$D_0 = W_0 + r_DD_0$$

(2)

As long as the interest rate on loans exceeds that on deposits, the net worth of the banking system will increase. The indebtedness of firms has increased by the amount of the wage bill plus interest on the total quantity of loans. Similarly, bank indebtedness has increased by the amount of the wage bill plus interest on bank money.

In the second production period, the indebtedness of firms will grow by any increase in the wage bill plus interest on any increase of indebtedness, and a similar argument applies to bank indebtedness. We are assuming, of course, that
interest is accumulated in the aggregate as debt. If firms used a portion of receipts from each production period to meet interest commitments, they would find that their ‘revolving fund of finance’ would shrink so that additional loans would have to be issued just to maintain the wage bill, unless bank receipts of interest are spent on consumption goods.\textsuperscript{28}

It is common in circuitist models to follow the example of Wicksell, in which the loan rate of interest equals the deposit rate of interest; if all interest receipts are spent on consumption goods, then firms receive sufficient income to pay interest. I do not follow this example. First, this ignores profit-seeking behavior of banks. Bank net worth exists (and grows) because the loan rate normally exceeds the deposit rate of interest. Second, assuming that all interest receipts are spent on consumption goods (whether the interest is received by banks or depositors) ignores the desire to accumulate wealth in monetary form (which is the object of all accumulation in a monetary economy). Third, this approach focuses on the medium of exchange function of money, rather than on the unit of account function. Thus, I prefer to assume that non-bank interest obligations are carried on the books of the banks, and that bank interest obligations are carried on the books of depositors. Since all money (in this model) is debt, growth of nominal values also implies growth of indebtedness – as interest must be paid on debt, one undertakes debt now only if one believes even more debt will be undertaken later. That is, one is willing to become indebted only if one expects the stream of returns to increase at a rate that exceeds the loan rate of interest. This is possible in the aggregate only if the aggregate level of indebtedness grows over time at a rate that exceeds the loan rate of interest. Furthermore, if the loan rate exceeds the deposit rate, even if all interest receipts were spent on consumption goods, firms cannot cover a portion of interest expenditures unless banks buy a portion of the output of firms so that the entire net worth of banks is realized in real terms. This is not consistent with one of the functions of banks, which is to maintain a substantial portion of net worth in liquid form. For these reasons, I prefer to carry interest on the books of ‘borrowers’ and ‘depositors’; thus, firms (as borrowers and depositors) are always net debtors to the banking system, with their net indebtedness equaling the net worth of the banking system.\textsuperscript{21}

In this case, the outstanding quantities of loans and deposits at the end of period two are:

\[
L_1 = L_0 + (W_1 - W_0) + R_L(L_1 - L_0) + R_L L_0
\]

\[
D_1 = D_0 + (W_1 - W_0) + R_D(D_1 - D_0) + R_D D_0
\]

By subtracting these equations from those presented above, we may obtain the growth of loans and deposits over the two periods:

\[
\Delta L = \frac{1}{1 - R_L} (\Delta W + R_L L_0)
\]
\[ \Delta D = \left( \frac{1}{1 - R_D} \right) (\Delta W + R_D D_0) \]  

Thus, the growth of firm indebtedness is determined by the interest rate paid on loans, on the growth of the wage bill, and on the initial quantity of loans issued. Similar arguments apply to bank money. The rate of growth of each is:

\[ \frac{\Delta L}{L_0} = \left( \frac{1}{1 - R_L} \right) \left( R_L + \frac{\Delta W}{L_0} \right) \]  

\[ \frac{\Delta D}{D_0} = \left( \frac{1}{1 - R_D} \right) \left( R_D + \frac{\Delta W}{D_0} \right) \]  

This means that the interest rates paid and the rate of growth of the wage bill set a minimum rate of growth on loans and deposits. Even if the wage bill does not grow, the minimum rates of growth are:

\[ \frac{\Delta L}{L_0} = \frac{R_L}{1 - R_L} \]  

\[ \frac{\Delta D}{D_0} = \frac{R_D}{1 - R_D} \]  

If the rate of growth of non-bank liabilities exceeds that of bank money, bank equity rises. Equation (9) shows the minimum rate of growth of non-bank liabilities which must be taken up by the banking system to maintain the revolving fund of finance and to permit fulfillment of interest obligations by firms. Equation (10) shows the minimum rate of growth of bank money consistent with maintenance of the revolving fund of finance and bank fulfillment of interest obligations on bank money. Equation (7) shows the rate of gross, nominal accumulation of the economy. The rate of nominal accumulation in the consumption sector is determined by the rate of growth of the wage bill in the investment sector, less the differential between equations (9) and (10). As we have assumed that the marginal propensity to buy bonds out of profits is one, the rate of growth of long-term bonds will be determined by the rate of growth of the wage bill in the investment sector, plus the long-term interest rate on bonds. This allows the investment sector to realize produced goods in money form.

Thus, uncertainty leads to the development of money and interest, while interest ensures that the circuit must grow. This means that a capitalist system, which is fundamentally a monetary economy, must accumulate 'capital'; in the case of firms, 'capital' includes those real and financial assets expected to generate net money receipts at a rate which exceeds the interest rate on the combination of short-term and long-term liabilities issued to fund positions in this capital. For banks, 'capital'
primarily consists of the short-term and long-term debts of firms, and positions in
this capital are financed by issuing short-term liabilities – or bank money. Due to
uncertainty and interest rates, the outstanding stocks of liabilities – including bank
money – must grow to allow accumulation in money form. In the case of non-bank
firms, nominal accumulation is as shown in equation (7); in a credit money
economy, the monetary wealth of non-banks equals their liabilities. When we net
out financial assets and liabilities of the non-bank sector, we are left with the real
assets created by the labour in the investment sector. The creation of these real
assets occurs only where expected money receipts at the individual level outweigh
nominal commitments. In the aggregate, as mentioned above, this is made possible
by nominal accumulation – that is, by growth of the revolving fund of finance (or
the wage bill and interest) over time. The interest rate on bank money must be less
than that on non-bank money in order to ensure accumulation of net wealth by
banks. This is normally ensured because bank money is more liquid due to the
special status of banks – as will be discussed in the following section.

6 THE RISE OF FIAT MONEY AND CENTRAL BANKS, AND THE
SPECIAL STATUS OF BANKS

As discussed above, the first and most characteristic form of money in a monetary
economy is credit money. Later, however, commodity money in the form of
coined precious metals was developed and circulated side-by-side with credit
money. Still, in a monetary economy, the vast majority of money takes the form
of credit money. There are two reasons for this. First, a volume of credit money is
built up during the normal production process, which is forward looking through
an uncertain future, and which necessarily operates in historical time. Thus, pro-
duction always involves ‘money now for more money later’ and a system of
credits is necessarily created. This has long been recognized, as indicated by
Marx’s affirmative quote of Coquelin:

‘In every country the majority of the credit transactions takes place in the circle of
the industrial relations themselves … the producer of the raw material advances it to
the capitalist, who works it up, and receives from him a promise to pay on a certain
day. The manufacturer, having completed his share of the work, in his turn advances
his product on similar conditions to another manufacturer, who has to manipulate it
further, and in this way credit extends more and more, from one to the other, down
to the consumer … All borrow with one hand and lend with the other, sometimes
money, but more frequently products. In this manner an incessant exchange of
credits, combining and crossing in all directions, takes place in the industrial rela-
tions. The development of credit consists precisely in the multiplication and growth
of these mutual credits, and here is the real seat of its power. (Coquelin, from
Du Credit et des Banques dans L’Industrie, 1842, quoted in Marx, 1909: 472)"
[Second], a monetary economy cannot function on the basis of commodity money. As discussed above, monetary economies must grow if for no other reason than that loans always carry interest – thus, accumulation is necessary. There is no guarantee, however, that the supply of commodity money will grow at a sufficient pace to allow fulfilment of interest commitments.

There is one significant problem with credit money, however: its value is only as good as the creditworthiness of its issuer. If the issuer defaults, credit money loses its value. Commodity money, on the other hand, is a representative money whose value is not determined by the creditworthiness of any particular issuer – in a sense, its value is established by the value of money issued by the most creditworthy debtors. As such, there is no fear of default on commodity money. This generates two special characteristics of commodity money: it need not pay interest, and privately issued credit money will naturally be made convertible into commodity money: in order to enhance the circulation of a particular private money, it can be made convertible into commodity money on demand (or under certain specified circumstances), allaying the fears of holders. While the credit money will pay interest (the rate of which will depend on the perception of the ability of the issuer to convert these liabilities into commodity money), commodity money need not.

Thus, we observe that credit money comes to be issued on the basis of reserves of commodity money, leading to the orthodox deposit multiplier story. However, it is important to note that this arrangement occurs after the development of sophisticated credit arrangements, and not as in the orthodox story in which goldsmiths discover they need keep only fractional reserves.

Only recently did governments become sufficiently creditworthy that their liabilities would circulate as money. Previously, governments had to rely on commodity money, which could be obtained through seigniorage, taxes or borrowing. Ability to obtain purchasing power through seigniorage was very limited because the value of commodity money is based on the quantity of precious metals contained in the coins. Attempts by the government to debase coin only led to rising prices in terms of the commodity money (although not necessarily in terms of privately issued credit money). Before the development of representative government, governments were also limited in their ability to collect taxes (relying on force) or to borrow. Typically, a monarch could only borrow against a specific revenue source (‘anticipate’ specific taxes) or issue debt on the basis of a guarantee of creditworthiness provided by prominent individuals or institutions. That is, unlike the situation today, government liabilities were backed by private guarantees of creditworthiness.

The first central banks were created specifically to provide purchasing power to the government. In return for taking up government debt, these central banks were given favourable treatment and various monopoly rights. Most importantly, various restrictions were placed on private note issue by other banks. As notes were the principal liability of early banks, such restrictions gave the central bank great advantages. Gradually, central banknotes replaced private notes and came to be used as the reserves and as the means of payment for settling interbank liabilities.
Money in the Circular Flow

(which gradually took the predominant form of checkable deposits). Furthermore, private bank liabilities became convertible into central bank liabilities, rather than commodity money. The central bank came to recognize that as its liabilities operated as bank reserves, this not only gave the government a very large source of purchasing power in the form of central bank fiat money, but it also gave the central bank some control over private banks through the discount mechanism. By the late nineteenth century, lender of last resort operations were discovered – which essentially gave a privileged status to bank money over all other forms of money since the central bank could guarantee that bank money bore no default risk.

Thus, a pyramidal structure has gradually evolved in which non-bank money is guaranteed by banks, is made convertible into bank money, and is retired using bank money; while bank money is guaranteed by the central bank, is made convertible into central bank money, and is retired using central bank money. Money which has no default risk need not pay interest. Thus, as discussed above, commodity money does not pay interest. With the development of the pyramidal structure, government fiat money (normally central bank liabilities) will not pay interest, either. Finally, as long as bank money is fully guaranteed by the central bank, it need not pay interest. However, for reasons which are beyond the scope of this analysis, regulations, institutional arrangements, and competition can generate a positive rate of interest even on bank liabilities which have no default risk.

All this means that a capitalist economy cannot function on the basis of commodity money or fiat money of fixed supply (due to the necessity of interest). Rather, it must rely on credit money. Since all monetary economies inexorably link balance sheets, individual fortunes are tied to macroeconomic performance. This means that individual ability to meet contractual obligations depends on macroeconomic functioning of the system as a whole. If one defaults on commitments, others may follow. Attempts to convert credit money into commodity money lead to a liquidation crisis since it is impossible to do so in the aggregate. Nominal values must shrink, circular flows diminish in value, and a general depression results. One way out of this is to tie credit money to fiat money, which may be issued without limit to avoid a liquidation crisis. This, however, is not possible until a pyramidal financial system has evolved so that fiat money replaces commodity money at the apex. At this point, the worst consequences associated with depreciation of credit are eliminated through lender of last resort operations – but this intervention might itself create other sorts of crises (the analysis of which is beyond the scope of this chapter).

7 POST KEYNESIAN AND CIRCUIT APPROACHES TO MONEY: A SYNTHESIS?

As Arena (this volume) discusses, the circuit approach emphasizes the existence of macro laws and structural relations which are independent of micro-level behaviour. In this approach, ex post circular flows are analyzed as logical necessities,
and closure of circuits at the end of each period is sometimes taken as a logical conclusion to the analysis. Thus, *ex post* equalities, such as expenditure equals income, or saving equals investment, arise as identities which must always hold over any period of any length. This has led some (such as Schmitt and Greppi in this volume) to argue that Say’s Law is an identity which must always hold in monetary economies because spending equals income, thus, all incomes must be spent.

Unfortunately, as emphasized by Arena (this volume), the circuit approach has not dealt adequately with liquidity preference, with the determination of asset prices, or with financial markets, in general. The problem really involves inadequate treatment of expectation formation under uncertainty. On the other hand, much of the Post Keynesian work deals explicitly with such matters. Thus, for example, Post Keynesians argue that while *ex post* identities do hold, *ex ante* divergence between expected spending and expected income can influence the levels actually achieved *ex post*. Say’s Law does not hold, according to Post Keynesians, because those who receive income may prefer to hold liquid positions. As liquidity preference rises, asset prices fall, causing production of physical assets to decline and *ex post* spending and income flows to diminish.

As a first approximation, one might say that circuitists have focused on the flow aspects of credit money, while Post Keynesians have emphasized money as a stock which is held because the future is uncertain. This dichotomous treatment has, however, become less clear cut. Davidson (1978) emphasized two aspects of money: the income generating-finance process and the portfolio-change process. In the income generating-finance process, money enters the economy endogenously as banks provide the finance which allows the circular flow to expand; while in the portfolio-change process, the money supply is increased exogenously as the central bank buys government bonds. The first of these is clearly a flow-supply approach to money and is quite consistent with the circuit approach. Similarly, Moore (1988) has developed a ‘horizontalist’ approach to money which is also consistent in this respect with the circuit approach. Finally, Rousseas (this volume) defines money demand as a demand for financing of investment – again, this is similar to the role played by money in the circuit approach. Thus, the Post Keynesian focus on money has shifted from an early emphasis on a stock approach (as in the textbook Keynesian liquidity preference theory) to include a flow-supply of credit money.

Does this mean that Post Keynesians will abandon liquidity preference theory and return to Say’s Law? They need not. First, we must continue to recognize that the future is uncertain, that production takes time, and that time is irreversible. This gives rise to the use of money contracts in private property economies and to the incorporation of interest into such contracts. As Keynes argued, an own rate of interest (or marginal efficiency) can be calculated for each commodity, which is the return in terms of the commodity on a loan in that commodity. Each of these own rates can also be quoted in money terms. Keynes then argues that: ‘[T]he rate of interest on money plays a peculiar part in setting a limit to the level of employment, since it sets a standard to which the marginal efficiency of a capital-
asset must attain if it is to be newly produced' (Keynes, 1964: 222-3). If the preference for liquidity rises, all asset prices are affected, and those of physical assets, in particular, will fall relative to the prices of liquid assets. This means that capitalists will reduce orders of physical assets, reducing the size of the industrial circuit as the wage bill falls – initially in the investment goods subcircuit, but later in the consumption goods subcircuit as well (through the 'multiplier'). Reduced spending also causes income to fall – for example, capitalist profits fall by the decline of the wage bill in the investment goods sector – and this has further effects on capitalist expectations. Because income is always tied to spending, and because forward contracts always involve 'money today for more money tomorrow', declining spending makes it impossible to meet contractual commitments.

Thus, there is a role for liquidity preference in the circuit. Even if the money supply is comprised solely of privately created credit, and even if the flow-supply were to expand to meet planned spending and expansion of the circuit, liquidity preference (a 'stock-demand') plays a role precisely because of its impact on demand prices of capital assets. As Keynes argued, rising liquidity preference does not mean that money hoards rise, but that asset prices adjust so that wealth-holders are content with the existing quantity of money. This does not mean, as is often assumed, that liquidity preference theory is inconsistent with an endogenous money approach, or with a circuit approach. It merely means that when the preference for liquidity rises, it is unlikely that this will be met by an increase in the flow-supply of money. That is, as capitalists become pessimistic about the future, they reduce production (or, the industrial circulation declines) and create fewer short term IOUs to finance the circuit. At the same time, the demand for liquid assets rises, raising prices of certain assets involved in the 'financial circulation'. Of course, previous commitments undertaken to finance a growing circuit will continue to grow at the rate of interest. As the industrial circulation shrinks, it will become increasingly difficult to meet these commitments. As discussed above, a debt deflation is a likely outcome.

Although spending always equals income, Say's Law does not hold. Spending determines income, and at the aggregate level, spending is identically equal to income, but individuals need not spend all their income. If workers choose to hold some of their income in liquid form (for example, in the form of short-term liabilities issued by firms or banks), then expected sales of produced goods may be lower than anticipated. Firms find that outstanding short-term liabilities (held by workers as savings or by banks which have intermediated from firms to workers) equal the value of unintended inventory accumulation. Thus, capitalist income is partially 'realized' in non-money form. This does not negate any aggregate identities, but it is likely to reduce the expectations firms have about future levels of effective aggregate demand. Since the goal of capitalist production is always to 'end up with more money than it started with', production which cannot be realized in money form will affect expectations and decisions regarding the level of production to be taken in the following period. In this way, current outcomes influence the size of the circuit as we move through time.
In summary, capitalist decisions to spend on the wage bill determine worker income, while capitalist decisions to spend on the wage bill in the investment goods sector determine capitalist income. Worker decisions to consume or to save determine whether capitalists can realize income in money form or in the form of involuntary inventory accumulation. That is, if workers save part of their wages, then capitalists cannot sell all produced consumer goods at prices sufficient to cover the total wage bill. In this case, profits can only be realized in the form of physical consumption goods. Worker and capitalist decisions over the form in which savings will be held will determine how positions in investment goods will be funded. For example, if savings are held in liquid form, then long-term bonds cannot be sold to savers to finance purchase of the produced investment goods. However, financial intermediaries might hold long-term IOUs and issue the sorts of short-term IOUs preferred by savers. Thus, while the saving decision cannot directly affect investment in the same period (since the income which is saved is created simultaneously with the production of the investment goods), saving decisions do affect the form in which profits are realized (money or physical goods) and the method used to fund long-term positions in real assets. In this way, expectations about the future may be impacted so that the ex post results achieved this period can affect production decisions to be made concerning the following period.

In private property economies, money is a social relation between debtors and creditors. In capitalist economies, money is representative of this general social relation, but it also represents a more specific social relation: the private creation of money allows capitalists to direct labour power toward the production of greater nominal values. This production, however, occurs in an uncertain world in which forward contracts and individual responsibility for one's own welfare create a preference for liquid positions. As apprehension about the future waxes and wanes, the industrial circulation tends to cycle round a path which only coincidentally corresponds with that which society, as a whole, might desire.\footnote{By combining the circuit and Post Keynesian approaches to money, we may come closer to understanding one of the major features of a capitalist economy:}

The financial circulation relies little upon labour power for expansion of nominal values, however. As liquidity preference rises, nominal prices of liquid assets rise, raising the 'marginal efficiencies' of these above the marginal efficiency of capital. Greater nominal profits can then be realized in the financial circulation than in the industrial circulation.\footnote{Unemployment results precisely because labour is not required to produce nominal values in the financial circulation (Davidson, 1978).} Unemployment results precisely because labour is not required to produce nominal values in the financial circulation (Davidson, 1978).

Thus, there is room for liquidity preference in the circuit. Furthermore, there is some independence of the financial and industrial circulations and liquidity preference helps to determine where capitalist efforts will be directed. When liquidity preference is high and efforts are directed toward the financial circulation, then "the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done" (Keynes, 1964: 159).}
cycles. While steady accumulation of nominal values is required due to the workings of compound interest, uncertainty in a non-ergodic world means that accumulation will not be steady. As expectations fall and accumulation is interrupted, payment commitments cannot be met so that defaults occur. A crisis ensues when a rush to liquidity cannot be met through the normal economic processes. Lender of last resort intervention helps to constrain the crisis, but may not eliminate the processes which generate crises.

Notes
* The author would like to thank John Henry, David Levine and Edward Nell for valuable comments.
1. See Chick (1986), Chick and Dow (1989), Moore (this volume), and Niggle (1990) for uses of ‘stages’ approach to the study of the evolution of the financial system.
2. Of course, money is not the only type of contractual liability: the indentured servant must also fulfill certain contractual obligations.
3. Davidson (this volume, and 1978) also emphasizes that real world contracts are written in money terms, and defines money as the means of contractual settlement.
4. Thus, tribal societies do not create or use money. While it is true that members of tribal societies are always under various social obligations, these are not in the form of well-specified contracts which enumerate individual responsibility. See Wray (1990) for a criticism of the conventional view that tribal societies use money.
5. Private property is a necessary, but not sufficient, condition for the existence of money. For example, a private property economy based on slavery does not require use of money. The relation between the slave and master is not based on a contract, thus does not involve a unit of account. On the other hand, a capitalist society does require money as the simultaneous existence of private property, independence of agents, and individual responsibility leads to the use of money contracts.
6. As the domain of private property shrinks – as in feudal society – the sphere within which money contracts are used also shrinks. Thus, feudal society, in which private property plays a diminished role, has little use for money (Dobb, 1963).
7. In tribal society, such risks are shared communally. Individuals in a tribal society are not normally held to be individually responsible for return of a loaned item if its return would result in individual hardship. See Heinsohn and Steiger (1983).4
8. In the ‘stages approach’ presented here, I rely primarily upon a logical reconstruction of the evolution to the modern financial system. However, I believe that this reconstruction is consistent with the theory of money presented here, and with the few historical facts we have about the origins of money and the evolution to the modern system. I will refer readers to more detailed, historical treatments. It must be emphasized, however, that historical facts do not speak for themselves; all historical analyses present an interpretation of these facts. The economist presenting an economic interpretation that relies to some extent on analyses provided by historians faces a formidable barrier: historians frequently have only a rudimentary understanding of economics. Indeed, most of the analyses of money written by historians appear to adopt a simple monetarist theory in which the supply of commodity money determines prices – even where this interpretation clearly conflicts with the ‘facts’ presented. To some extent, economists are forced to rely on logic, historical speculation, and theories about what money is and what money does; the analysis that follows is in this vein.
9. See Homer and Sylla (1991) for a discussion of such interest payments without money in primitive societies.
10. Of course, contracted interest payments allowed the ‘lender’ to appropriate a portion of the surplus generated by the ‘borrower’. As individualistic, profit-seeking behavior became the norm, this share of the surplus came to be seen as a ‘fair’ reward. The orthodox economist does not even distinguish between interest and profit, seeing both as a ‘return to waiting’. Clearly, when a property owner alienates property, it is to reap a share of the surplus generated by the ‘borrower’. Interest income represents a prior allocation of a portion of the gross profits to be generated, and the interest rate is determined by uncertainty.

11. Keynes showed that the early monetary units were based on a specific number of grains of wheat or barley. See Keynes (1982: 233–6) and Wray (1990, ch. 1).

12. Once a universal measure of social value is recognized, it becomes a purely notional construct whose value is freed from the physical objects (such as wheat) with which it was formerly identified. Thus, the money of account denominated in idealized wheat units is separated from actual wheat. At this point, an ideal money is created and prices are expressed in terms of this hypothetical money of account.

13. See Polanyi (1971), Heinsohn and Steiger (1989), Levine (1983), and Wray (1990) for critiques of the orthodox notion that money developed as a medium of exchange after the development of market economies based on barter.

14. The modern pyramidal structure with central bank fiat money at the apex was developed during the eighteenth and nineteenth centuries. In contrast, credit money is at least as old as writing. Of course, the ‘historical stages’ occur at different times in different societies. The ancient Near East developed a variety of monetary institutions and financial instruments between 3000 and 500 BC. Most of the societies with which we are familiar that used money had already reached my stage four. For example, both Greece and Rome used credit money and commodity money. Heinsohn and Steiger (1987) argue that the temples of ancient Babylonia played a role in the transition to a uniform unit of account (the transition to what I have called stage two); to reduce carrying costs, the temples substituted a metal money of account for the barley unit of account (my stage four); to eliminate counterfeiting, the temples finally switched to silver money. In every case, however, the metal monies were valued according to the barley grain weight equivalents. Heinsohn and Steiger (1983) argue that private property, and with it, credit money, developed in Mycenaean in the eighth century BC; while the first purely nominal coin did not appear there until the seventh century BC (my stage five). Medieval Islamic society had developed a range of private financial instruments (paper notes, bills of exchange) by the eighth century even though deposit banking and usury were prohibited; commodity money was used in conjunction with credit money (thus, this society had entered stage four). The Italian city states entered stage five with monetization of city debt as early as the mid-fifteenth century. However, in most of Western Europe, fiat money does not appear until the eighteenth or nineteenth centuries (See Wray, 1990).

15. ‘Metalists’ argued that gold was chosen as money because it is intrinsically valuable, thus, the value of money is determined by the intrinsic value of gold. On the other hand, ‘cartelists’ argued that the value of money has nothing to do with the intrinsic value of gold. This position is more consistent with the view presented here. See Cesaroni (1990) and Knapp (1924) for discussions of these views.

16. Thus, in the orthodox approach, a deposit of commodity money (gold) or fiat money (high-powered money) leads to an expansion of loans and deposits. It is interesting to note that orthodoxy ignores the case of Islamic society, in which harsh penalties ensure that deposits cannot be loaned, and cannot be used to meet ‘withdrawals’ or redemption of liabilities. This has not prevented such societies, however, from developing sophisticated financial systems based on credit money which could not have arisen through the deposit expansion process. If orthodoxy took account of
this, it might have recognized that there is something wrong with the story of the goldsmiths. See Wray (1990, chapter 2).

17. As mentioned above, Keynes showed that early monetary units were based on a specific number of grains of wheat or barley, while use of metals as money was a much later development. The value of 'metal money' would be determined by weight in terms of the number of grains of wheat or barley it represented. This is the reverse of the 'metalist' position that the value of commodity money is determined by the inherent value of the gold contained in the objects used as money. Rather than being chosen as money due to an intrinsic worth, precious metals were chosen for purely technical reasons: limited supply, density, and impervious nature. According to Keynes, coins were a later development, which came some 2000 years after the development of money (Keynes, 1982: 233–6, 255). Initially, the metal used for coinage would merely be stamped to indicate fineness, while the value of the coins would still be determined by weight. The first purely nominal coins were produced much later, under Phoenician Argos in the seventh century BC. See note 14 above and see Heinsman and Steiger (1984) and Wray (1990).

18. I will return later to a discussion of the reasons for the creation and use of commodity money.

19. See Wray (1990, chapter 2) for a discussion of government attempts to increase purchasing power and of the development of fiat money.

20. As discussed in Wray (1990), once money has first developed as credit money, credit money may disappear if private property disappears. That is, when private property is abolished (or diminishes in significance as an institution) as in Roman society, or feudal society, or even Soviet society, credit money loses its importance. To the extent that money is used in such societies, it takes the form of commodity money or fiat money, except in the restricted sphere in which private property remains.

21. There is no satisfaction point in the logic of accumulation because the existence of interest necessitates never-ending accumulation.

22. See Keynes (1964: 144–5) and Arena (this volume) for discussions of lender’s and borrower’s risk.

23. See Homer and Sylla (1991) for an examination of the historical trend of interest rates. Until the last couple of decades, the interest rate had fallen. Recently, interest rates have reached levels not seen since the development of the modern financial system (beginning in the seventeenth century in Holland or the eighteenth century in England).

24. See Schmitt and Greppi, this volume.


26. The initial value of the investment good equals its cost. However, upon accumulation of physical investment goods, their value is not determined by cost but by the gross profits they are expected to generate. Note that I have ignored profits in the investment sector. The model could be extended to take account of investment sector profits by allowing for additional deficit spending (that is, the consumption sector would spend more than its receipts to buy the capital goods) financed by additional money creation; or by adding a third sector (government or export) so that its wage bill would generate profits for the investment sector (although the third sector would not receive profits). In any case, however, I am interested in presenting the minimum rate of growth of the money supply required to ‘finance’ a circuit; adding profits for the investment sector would merely increase the quantity of finance required above that shown in my model.

27. This section provides a brief summary of a more detailed treatment which can be found in Wray (1991).

28. As we have assumed that the marginal propensity to save out of wages is zero, all interest received by workers must be spent on consumption goods – thus, bank inter-
est obligations are carried on the books of capitalists. Since we assume workers don’t borrow, all nonbank interest obligations are incurred by capitalists and are carried on the books of banks. Note also that I assume capitalist interest receipts are not used to reduce interest obligations; as Marc Lavoie has pointed out to me, this would – at the limit – reduce the required money growth rate to the differential between the loan and deposit rates.

29. Of course, this can set off a ‘debt deflation’ as described by Irving Fisher (1933) and, later, by Hyman Minsky (1978). Marx also recognized that ‘It is precisely the enormous development of the credit system during a period of prosperity, hence also the enormous development of the demand for loan capital and the readiness with which the supply meets it in such periods, which brings about a shortage of credit during the period of depression’ when there is a run to liquidity (Marx, 1909, p. 332).

30. Kregel (this volume) argues that monetary economies must have some exogenous money to use as a final means of payment. However, credit money can be used as final means of payment by those lower in the pyramid.

31. See Wray (1990) for a detailed discussion of government attempts to obtain purchasing power and of the rise of fiat money.

32. See Wray (1990) and Goodhart (1989) for analyses of the rise of central banking. Kregel (this volume) examines the creation of the Bank of England as a means to provide finance for a war with France.

33. Tooke argued that the central bank should provide liquidity as necessary by discounting good paper in order to stop runs, but, as Bagehot described, the Bank of England generally operated in precisely the opposite manner until late in the nineteenth century because it did not see itself as a central bank. See Tooke and Newmarch (1848), Bagehot (1927), and Wray (1990). As Aglietta (this volume) argues, lender of last resort operations were initially prescribed as a way to save healthy banks, and not as protection for insolvent banks. However, if there is a run to liquidity so that asset prices fall, banks will become insolvent. Thus, the distinction between use of lender of last resort operations to provide liquidity rather than to rectify problems of insolvency is not so clear.

34. See Rousseas (this volume) for a discussion of the distinction between financial and industrial circulations.

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