Post Keynesians and Circuitists on money and uncertainty: an attempt at generality

Ever since Keynes’s (1933) seminal work, several economists have drawn a distinction between the orthodox theory of a barter economy and the radical project of a monetary theory of production (cf., for example, Davidson, 1978; Rotheim, 1981; de Carvalho, 1992). Two of the most active groups of scholars that have insisted on that difference have been Post Keynesians (e.g., Arestis, Chick, Davidson) and Circuitists (e.g., Graziani, Lavoie, Parguez, Schmitt), respectively (cf. Deleplace and Nell, 1996).

The Post Keynesian approach and the Monetary Circuit approach are not so much schools of thought as ways of thinking about monetary problems. Within the Post Keynesian camp itself, for instance, there are many perspectives, for example, accommodationists and structuralists (cf. Fontana, 1999b). The Monetary Circuit approach boasts an even less united group of economists. In fact, many economists working in that tradition, for example, Schmitt, do not accept the term itself. However, Post Keynesians and Circuitists both hold strongly to the view that the orthodox approach of firstly analyzing a barter economy, and then adding on money as an afterthought, is unhelpful as a foundation for any economic analysis (cf. Arestis, 1996, and Parguez, 1996, respectively). More importantly, Post Keynesians and Circuitists share a genuine commitment to understand the nature and functions of money in modern economies. As scholars working in the tradition of Keynes’s monetary theory of production, they firmly believe that money matters. Money is not neutral either in the short or in the long run.

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However, readers of the Post Keynesian and Circuitist literature must find it increasingly difficult to understand the crux of the matter. In a real sense it seems as if these scholars require a dichotomy in the minds of the readers. Sitting in an ideal lecture theatre, from 9:00 to 9:50, the audience is presented with a Post Keynesian theory of money nonneutrality. The arguments are mainly concerned with the utility of holding a liquid store of wealth in an uncertain world and the related negative consequences for the economy on the level of output and employment (cf. Davidson, 1994). Then, the audience has barely ten minutes to clear its mind for the increasingly popular 10:00 to 10:50 discussion of the Circuitist theory of money nonneutrality. At this time either uncertainty does not enter into the overall picture or is considered inconsistent with the very notion of money (cf. Parguez and Seccareccia, 2000). The core of the lecture is on how the spending of the means of payment alters the structure of a modern economy and gives content to the equilibrium position for the level of output, income distribution, and employment.

The objective of this paper is to explore the constructive analysis of those two very active but independent approaches to money nonneutrality. The paper seeks to move beyond the negative (but necessary) task of criticizing the orthodox theory of a barter economy to the positive task of developing a more general theory of money and uncertainty grounded on recent contributions by Post Keynesians and Circuitists. The driving force behind this paper is the idea that Keynes’s monetary theory of production provides a grand exciting research project that is yet to be fulfilled.

There are two main tasks that call for a more unified approach. Firstly, as money is used to deal with the uncertainties that characterize the modern businesses of exchange and production, it should not come as a surprise that relevant theories have favored some, rather than all, of the complex functions of money. No one aspect of money can stand on its own as a complete account of what money is and what money does in a modern economy. Secondly, Post Keynesians and Circuitists have separately worked out in detail a theory in which economic agents—mainly firms, banks, and wage earners—are motivated by monetary rather than commodity returns. However, the considerable progress made in recent years by those two groups of scholars calls for a clarification and possibly a synthesis of the positive aspects of each approach (cf. Lavoie, 1992). The main hope is that, once such tasks are completed, the audience returning to the ideal lecture theatre may appreciate that Post Keynesians and Circuitists have in a coherent way occupied themselves
with working out a monetary theory that explains the intimate links between money and uncertainty in a modern economy.

The structure of the paper is as follows. The following section provides the Post Keynesian perspective on money, uncertainty, and unemployment. Next, the Circuitist perspective on money, uncertainty, and production is discussed. Then, a synthetic view of those two perspectives from what may be called a modern view of Keynes’s monetary theory of production is presented. Finally, concluding remarks are provided.

Uncertainty, money, and unemployment: a Post Keynesian perspective

Ergodic versus nonergodic economics

Within the Post Keynesian tradition, the work of Davidson forms the cornerstone of ideas on money and uncertainty (cf. Holt et al., 1998). Central to Davidson’s approach is the rejection of the general applicability of the idea of ergodicity to the explanation of economic problems. The notion of ergodicity has its most popular antecedents in the work of Samuelson (1969). By ergodicity Samuelson means that economic models have the property of being equilibrium analyses in which hysteresis phenomena are deliberately excluded. The description of the economic system is such that earlier states do not have any influence on the final conditions of equilibrium. As Samuelson says, no matter how the system starts, after some time “things settle down to a unique position independently of initial conditions” (Samuelson, 1969, p. 184).

In responding to this view, Davidson concedes that, in economics, empirical knowledge is based on time averages (i.e., time series statistics) and space averages (i.e., cross-sectional statistics) of past and current economic observations. However, Davidson believes that Samuelson’s view demands more than that. He explains that what the ergodic hypothesis requires in technical terms is that the stochastic process that generates those statistics is such that time averages and space averages always coincide as the number of observations increase (cf. Davidson, 1988, p. 331). What is then practically assumed in Samuelson’s view is that the future is simply a reflection of the past. Using a probabilistic analysis of past and current economic observations, future economic outcomes can be reliably predicted. Davidson also recognizes that two variants of the “ergodic hypothesis approach” may be discerned:

*Type 1, immutable reality models*, presume that, at the initial instant, knowledge regarding future outcomes is either perfect or, at least, statistically
reliable. . . Type 2, immutable reality models, assume that, in the short-run, agents’ knowledge regarding reality is severely incomplete or even completely unknown. (Davidson, 1996, p. 484)

Both types of model can only be used to investigate a “closed world” where the choices made by agents are defined for a complete set of possible alternatives (cf. Fontana, 1999a, par. 3.3; Lawson, 1997, ch. 8). Since reality is seen as immutable, agents have, or act as if they have, the possibility of discovering the essential parameters that describe future states of the world. That agents may lack information about the future, though only in the short run, is not completely excluded, but with time and the use of resources, complete and reliable knowledge of reality can be acquired. In the long run, individuals can overcome ignorance. “Immutable reality models” then only accord a very limited role to agents’ knowledge in economic analysis.

On this ground Davidson argues that the ergodic hypothesis is the main restraint modern orthodox theorists face in attempting to answer Arrow and Hahn’s call for a serious monetary theory (cf. Arrow and Hahn, 1971, p. 357). Against the “ergodic hypothesis approach,” Davidson and Post Keynesians in general suggest replacing equilibrium with history as the organizing concept in economic modeling (cf. also Settersfield, 1997). In particular, Davidson proposes the general characterization of the economy as nonergodic and advances a radical interpretation of uncertainty centered on the principle that the economic environment is seen as transmutable. Emphasis on risk-based views of uncertainty is eschewed, with the focus of attention placed on what is termed “fundamental” uncertainty (cf. Fontana and Gerrard, 1999). It exists where, due to the permanent historical evolution of the economic environment, reliable information upon which to base prediction is simply not available. Post Keynesians perceive the “human condition” as nonergodic. In particular, this is seen as an inevitable feature of modern economies “in which a myriad of independent agents make decisions whose impacts are aggregated into outcomes that emerge over a range of tomorrows” (Minsky, 1996, p. 360). Uncertainty is then the result of sequential interaction between agents involved in decision-making processes. No matter how sophisticated the processing abilities of agents are, all relevant information does not exist. As Kregel notes, “what must be known to decide today will be known only when the effects of those decisions take place” (Kregel, 1980, p. 37). Thus, the modeling of decision-making in a world of fundamental uncertainty is highly problematic.
The nature of money in Post Keynesian/nonergodic economics

Once uncertainty is recognized as a pervasive feature of reality, agents are liable to make decisions that, ex post, may be undesirable.

They will, therefore, feel queasy about undertaking any actions which will commit their current claims on resources onto a path which can only be altered, if future events require, only at very high costs, if at all. (Davidson, 1972, p. 222)

If making a decision holds out the potential of altering the existing state of affairs, then it may prove costly, if not impossible, to restore the ex ante situation. This means that agents will sometimes prefer to postpone decisions. “In a world of uncertainty, he who hesitates is saved to make a decision another day” (Davidson, 1972, p. 16). How can agents postpone a decision and yet be ready to make immediate use of claims on resources? Money in its role as a store of wealth provides that possibility (cf. Keynes, 1937, p. 116). Holding money gives the opportunity to delay action but it also represents an immediate claim on resources to be used if circumstances prove it profitable. Money is a “time machine” that allows the transfer of purchasing power from the present to the future.

Having established the need for holding money, Davidson proceeds to describe the essential properties associated with the asset (or the set of financial assets) that fulfills the role of being money. Drawing on Keynes’s theory of liquidity preference (cf. Keynes, 1936, ch. 17), Davidson argues that money has mainly two attributes: (1) a zero or very small elasticity of production and (2) a zero or very small elasticity of substitution with any other asset that has a high elasticity of production (cf. Davidson, 1972, p. 222). The first characteristic means that, when the demand for liquidity increases, additional resources cannot be marshaled at will by firms in order to produce additional quantities of liquidity. The second characteristic establishes that any increase in the price of money (i.e., long-run interest rate) caused by an increase in the demand for liquidity does not spill over into a demand for assets with a

1 Davidson, as Keynes before him, seems content to leave to the purpose at hand deciding what can be really considered as money: “Without disturbance to this definition, we can draw the line between ‘money’ and ‘debts’ at whatever point is most convenient for handling a particular problem. For example, we can treat as money any command over general purchasing power which the owner has not parted with for a period in excess of three months, and as debt what cannot be recovered for a longer period than this; or we can substitute for ‘three months’ one month or three days or three hours or any other period; or we exclude from money whatever is not legal tender on the spot” (Keynes, 1936, p. 167, n. 1).
high elasticity of production. Those two characteristics define money as a liquid time machine for moving purchasing power in time.

The attribute of "liquidity" is by no means independent of the presence of these two characteristics [i.e., very low elasticities of production and substitution]. For it is unlikely that an asset, of which the supply can be easily increased or the desire for which can be easily diverted by a change in relative price, will possess the attribute of liquidity in the minds of owners of wealth. (Keynes, 1936, p. 241, n. 1; as quoted in Davidson, 1977, p. 109)

The existence of a liquid store of wealth with those characteristics means that the critical link between supply of, and demand for, resources, as expressed by Say's law, is broken. As Keynes saw it, that liquid store of wealth stands as a barrier to full employment. Unemployment results because "the owners of wealth demand what cannot be produced (money) and do not demand what can be produced (other forms of wealth)" (Dillard, 1955, p. 16). Agents react to what is seen as an uncertain future by hoarding money. Yet, by pursuing this course of action, further uncertainty is created. Money holding represents a potential demand for goods and services, but firms face problems in forming expectations about the timing of that demand. Indeed, it may forever remain a potential demand. Thus, savers seeking to mitigate the effects of uncertainty cause even more uncertainty for firms. For any level of money holding, the ratio of expenditure to income could be lower than its full employment level. The consequent negative impact on effective demand and the level of profit would then cause unemployment. In this respect, Post Keynesian analysis of the connection between uncertainty and money reasserts and strengthens the critical idea Keynes sought to advance in the General Theory (1936), namely, the possibility of long-term limits to profitable expansion of output before full employment.

Unemployment develops, that is to say, because people want the moon;—men cannot be employed when the object of desire (i.e., money) is something which cannot be produced and the demand for which cannot be readily choked off. (Keynes, 1936, p. 235)

From a Post Keynesian perspective, unemployment is not a short-run phenomenon. In particular, unemployment is not the result of booms and slumps due to inaccurate expectations. Davidson, and Post Keynesians in general, have shown that money holding provides agents with a means to defer immediate commitment of resources. Hence, the economic system may settle in equilibrium at any level between zero and full employment (cf. Kregel, 1976, pp. 213–214).
Money and production: a Circuitist perspective

A basic model of the monetary circuit

The idea of money as the means of payment has a long tradition in economics. Classical economists like Adam Smith or John Stuart Mill, or more modern economists like Marshall and Wicksell, had in fact mainly considered money in its role of means of payment (cf. Graziani, 1994; Realfonzo, 1999). Following that tradition, in the Treatise on Money (1930) Keynes went to great length to demonstrate what the means of payment does in a modern economy. Keynes focused on what he called the "causal sequence" that describes any production process. He observed the natural association between the beginning and the development of the production process on one side, and the creation, the circulation, and the utilization of money on the other side.

Circuitists have elaborated on those ideas and have proposed a basic description of the process of creation and circulation of money. They have advanced a simple stage-by-stage analysis that highlights how the flow of money is created, how it circulates, and finally how it is transformed into a stock of money balances (cf. Graziani, 1989; Parguez, 1996; Lavoie, 1999; Fontana, 1999b).

Circuitists have emphasized the distinction between firms, which are involved in income-expenditure decisions, and banks, that is, suppliers of credit-money. For any production process, it is argued, firms need to negotiate loans with banks. As Keynes says,

in order that producers may be able, as well as willing, to produce at higher cost of production and to increase their nonavailable output, they must be able to get command of an appropriate quantity of money and of capital resources. (Keynes, 1930, p. 182)

2 Circuitists provide a very simple picture of the process of creation of money. Complex and increasingly important phenomena like consumer credit and speculative borrowing are not adequately investigated within the Circuitist framework. Consumer credit should be considered as banks' loans to households in advance of their incomes, whereas speculative borrowing calls for a deep understanding of the relationship between the financial and the real sectors (cf. Chick, 2000; Kregel, 1986).

3 Graziani (1987, pp. 33–34) has argued that the finance motive of Keynes should be related to a theory of endogenous supply of money rather than a theory of (an additional) demand for money (cf. also Chick, 2000, 126; Sawyer, 1996).

Graziani maintains that there is no reason for limiting the pivotal influence of initial finance to the production of capital goods. It applies equally well to the production of consumption goods (cf. for example, Graziani, 1987). Keynes's writings do not always provide support for this argument, but Richard Kahn, one of Keynes's closest followers, clearly held a similar idea (cf. Kahn, 1984, p. 165).
A price, the loan rate, is established by the demand for credit-money of firms and the supply of credit-money of banks. The former rests on the expected yield on investment compared to yields on other real and financial assets, whereas the latter depends upon the discount rate and the expected yield on loans compared to other assets in the banks’ portfolios (cf. Palley, 1994; Dow, 1997; Fontana, 1999b). An initial flow of money in the form of bank deposits thus arises out of the negotiations between banks and firms. Those deposits are then used by firms to pay the owners of inputs. If transactions between firms are ignored, labor services are the only input to purchase. The initial flow of money is equal to the wage fund transferred from firms to wage earners.

Circuitists hold that the trade between firms and wage earners sets the process of the circulation of money in motion. Wage earners play no role in the creation of the flow of money, but as recipients of bank deposits they have a crucial role in the circulation of those deposits. In fact, once they receive bank deposits, they have to decide how much to spend on the goods market and how much to save. Savings may be then allocated between different securities and money balances. If, for simplicity’s sake, public and foreign sectors are ignored, firms are the only issuers of securities. Looking at the final stage of the production process, a first possibility is that bank deposits are entirely spent either on the goods market or on the financial market. Firms get back the initial flow of money and are able to repay all debts to banks. Money stock does not change, but the flow of money has proved essential for the reproduction of the economic system.

This possibility can be illustrated in terms of the balance between flow-demand for securities by wage earners and the flow-supply of securities by firms (cf. Davidson, 1972, ch. 13). From the equilibrium condition between savings (S) and investment (I) it follows that:

\[ S = I \]

\[ S_F + S_{WE} = I \]

\[ s_F \Pi + (m)s_{WE}Y_{WE} + (1 - m)s_{WE}Y_{WE} = (1 - i)I + (i)I. \]  

(1)

Where \( S_F \) and \( S_{WE} \) are respectively firms’ and wage earners’ aggregate savings, \( s_F \) is firms’ savings ratio out of profit (\( \Pi \)), \( s_{WE} \) is wage earners’ savings ratio out of income (\( Y_{WE} \)), \( m \) is the marginal propensity to pur-
chase financial securities out of $S_{WE} (1-m)$ is the marginal propensity to hold money balances out of $S_{WE}$. $i$ and $(1-i)$ are respectively firms' investment ratios of the externally and the internally financed aggregate investment ($I$).

If the aggregate savings out of profit of firms are equal to the internally financed investment, that is, $s_f \Pi = (1-i)I$, it follows that:

$$(m)S_{WE}Y_{WE} + (1-m)S_{WE}Y_{WE} = (i)I.$$  \hspace{1cm} (2)

Then, if the sales expectations of firms are met, $(m)$ is equal to unity. "The aggregate planned net 'debtor' position of firms is growing pari passu with the aggregate planned net creditor position of households [i.e., wage earners]" (Davidson, 1972, p. 324):

$$s_{WE}Y_{WE} = (i)I.$$  \hspace{1cm} (3)

An alternative, and more realistic possibility, is that wage earners may decide to hold part of their savings in liquid form. What is happening is that the demand for assets-money by wage earners has changed and as a result of this some of the initial flow of bank deposits is transformed into a stock of money balances (cf. also Davidson, 1977, p. 104, n. 19). Firms do not get back the entire flow of money and therefore they are only able to repay banks for part of their initial loans. The sales expectations of firms in the goods and financial markets are not met. In terms of Equation 2 that means that with $(m)$ being less than unity there is now a positive flow-demand for money balances:

$$(1 - m)S_{WE}Y_{WE} > 0.$$  \hspace{1cm} (4)

Hence, the volume of savings allocated for securities by wage earners is lower than the volume of securities supplied by firms to (externally) finance investment:

$$(m)S_{WE}Y_{WE} < (i)I.$$  \hspace{1cm} (5)

Firms now face the risk of disruption to their production processes because of the increased desire for money balances of wage earners. If, as is likely to be the case, firms wish to continue their activities, they have to renegotiate bank loans equal to the net stock of money in addition to any lending necessary to start a new production process. As Keynes says,

how much bank-credit they [i.e., firms] have to borrow in order to obtain command over a sufficient quantity of money depends on what the public is doing with its savings. (Keynes, 1930, p. 182)
If the banking system agrees to accommodate the liquidity needs of firms, that is, to finance the positive flow-demand for money balances of wage earners by a proportional expansion of the money supply, then the risk of disruption of the economic process is avoided:\(^4\)

\[ \Delta M^S = (i)I - (m)s_{WE}Y_{WE} = (1 - m)s_{WE}Y_{WE} \]  \hspace{1cm} (6)

Again, the crucial role played by the banking system is made explicit. The banking system is looking after that portion of capital goods that wage earners do not wish to own:

The extent to which the banks hold securities, finance the holders of securities, and finance the holding of physical assets, is equal to the quantity of money. The quantity of money is the means by which the public [i.e., all agents except the banking system] hold that part of their wealth which is looked after by the banking system. (Kahn, 1954, p. 238; cf. also Davidson, 1972, p. 326)

The Circuitist description of the final stage of the production process allows some discussion on the relationship between the initial flow of bank deposits and the final stock of money balances.\(^5\) The generation of the flow of money results from negotiations between banks and firms on the credit-money market, whereas the stock of money balances is held by savers as a residue of their portfolio choices on the financial market. What, then, is the relationship, if any, between the flow of money and the stock of money? And more importantly, could firms substitute bank loans with nonmoney assets as a way to finance production?

For the single firm the answer cannot be anything but positive. The choice of bank loans over other forms of finance depends on costs, terms, and conditions. What matters is that some liquidity, to replenish bank balance sheets and possibly to start a new production process, is avail-

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\(^4\) Alternatively, if it is assumed that firms usually have over time accumulated money balances, i.e., firms have a positive stock of liquid savings, then the positive flow-demand for money balances of wage earners could be accommodated by a decrease in the stock-supply of money balances of firms. However, there are evident limits to the amount of liquidity that firms can raise out of past savings. As Hicks explains, firms will soon resist the running down of their cumulated money balances. “The absence of reserves, either in the form of liquid assets or of assured borrowing power, is a severe constraint on freedom; it must therefore be expected that the decision-maker will seek to remove it, if that can be done at reasonable sacrifice, so far as he can” (Hicks, 1979, p. 9).

\(^5\) In particular, it helps to clarify some controversial issues debated in the modern literature on endogenous money (cf. Arestis and Howells, 1996, 1999; Asimakopulos, 1988; Dow, 1996, 1997; Lavoie, 1996, 1999).
able. For firms as a whole, however, “non-money assets finance” can never be a substitute for “bank loans finance” (cf. Graziani, 1996). In fact, the liquidity owned by wage earners is in the nature of a residue, that is, what is left after expenditure in the goods market. At most, through the issue of financial assets, firms are able to recoup part or all of the existing liquidity and thereby to replenish bank balances partly or completely. At any given moment, in circulation there is only finance to repay banks but not to fund new businesses.6

Nevertheless, “non-money assets finance” is essential for the prosperity of firms. Financial markets do not grant new liquidity but they capture liquidity from wage earners. If liquidity is not recovered, firms would be left in a very difficult position at the moment of renegotiating new bank loans. In fact, money balances measure the outstanding debt of firms toward banks. Hence, the lower the net stock of money after each production process, the easier, ceteris paribus, it would be for firms to renegotiate a new flow of money (cf. Arestis and Howells, 1996; Fontana, 1999b).

The nature of money in the monetary circuit

Recently Deleplace and Nell have argued “no time relationships, no links between present and future, exist in the definition of money” when money is considered in its function as the means of payment (Deleplace and Nell, 1996, p. 24). This understanding of one of the most celebrated roles of money is one among several, yet it amounts to a serious misinterpretation. In fact, it is precisely because of the unfolding of time that economic agents use the means of payment. Unfortunately, some Circuitists, so eager to differentiate their analysis from the approach used by Keynes in his General Theory, have overlooked the fact that a theory of a monetary production economy without uncertainty is almost a contradiction in terms (cf. Parguez and Seccareccia, 2000, p. 117).7 Any analysis that pretends

6 However, the running down of money balances may provide extra finance for starting production processes as an alternative to new bank loans. Even if that is the case, there is a limit to the amount of liquidity that firms can raise in that way (cf. note 5). A further qualification is suggested by Chick’s recent comparison of non-money assets finance with bank loans finance. “The contribution to income of investment financed in these ways [i.e., non-money assets finance] is through gains in efficiency or scale, whereas an investment accompanied by new money [i.e., bank loans finance] immediately causes a rise in money income” (Chick, 2000, p. 133).

7 Parguez and Seccareccia not only strongly reject any link between money and uncertainty but pretend to derive from the analysis of the momentary circuit an “inconsistency” between money and its own role as a store of wealth. “[In fact] such a function is inconsistent with the notion of money. Money exists and has a value
to look at an economy in which monetary commitments to action, and related consequences, do not take place simultaneously (e.g., a sequential economy) have to face the problem of decision-making under uncertainty.

In this regard Goodhart (1989) has pointed to the functional definitions of a medium of exchange and the means of payment (cf. also Shackle, 1971). The former is different from, and conceptually broader than, the latter. A medium of exchange embraces any private claim that allows a transaction to go ahead. Private claims are valuable in a world of increasing complexity. They widen the boundaries of contemporaneous exchange of goods and services.

In a world of certainty... person A could sell goods to person B at time $t$, confident in the knowledge that his claim on goods in return will be met by a transfer from person C at time $t+n$, while B may extinguish his debt by selling services at some other time to some other person. (Goodhart, 1989, p. 27)

However, agents trade in a world of uncertainty. Transactions have an important time dimension, hence a seller is not confident that his claim on goods and services will be necessarily met at some future date. In general, agents know that the use of a medium of exchange does not help to meet and alleviate the uncertainties attached to the unfolding of any economic process. By contrast, when agents receive the means of payment in return for goods or services, they will feel confident that the transaction has been completed, and that they now have a valid claim for future goods and services against any seller in the market. Thus, it is proper in the definition of money as the means of payment that a time relationship—a link between present and future—is singled out. What money, as the means of payment, does is replace debt obligations within the nonbank public (i.e., firms and wage earners) with debt obligations between the nonbank public and banks.

Uncertainty pervades the sequence of stages in the production process and calls for the means of payment to cope with it. It is in this role that money is meaningfully understood as a flow of purchasing power. It allows firms, banks, and wage earners to accomplish transactions as they adjust to the unforeseen and unforeseeable. In an uncertain world, agents face no guarantee that their plans and expectations will be real-

only as long as it is spent by non-bank agents for the purpose of creating future wealth. The hoarding of money in the form of bank deposits merely obstructs the process of wealth creation upon which the value of money depends” (Parguez and Seccareccia, 2000, p. 105).
ized. The realization process is constantly disrupted and remains characterized by fluidity and volatility. Uncertainty prevents smooth progress toward the fulfillment of initial plans and expectations, and simultaneously sets in train processes that lead to their revision. The behavior of agents is then affected in two ways. Firstly, the unfolding of an unknowable future acts to frustrate current courses of action or reveals superior means of achieving desired ends. Whilst their objectives remain the same, agents are continually forced to take reactive action in an effort to circumvent barriers thrown up by uncertainty. Secondly, there exists a need for agents to revise their aims as new information and knowledge emerges. The onus is then on firms, banks, and wage earners to act proactively in order to search out courses of action that facilitate the achievement of their now favored objectives.

Money as the means of payment allows reactive and proactive responses to the vagaries of uncertainty. As Hicks explains, “parallel to the real events, which have one course in time, are constantly changing series of planned or expected events, with similar but distinct courses” (Hicks, 1982, p. 222; cf. also Fontana, 2000). By using money, firms can carry out activities that had previously not been considered but have subsequently become vital to the realization of their goals. In the same way, wage earners may divert the flow of money toward patterns of consumption and saving more suitable to present circumstances.

In this role, money grants agents flexibility in the pursuit of their objectives and provides them with a means to ameliorate the disruptive effects of uncertainty. Hicks expressed the same idea, saying “liquidity is freedom” (Hicks, 1979, p. 94). The transactions necessary to the realization of objectives change through time. Money as the means of payment gives freedom to respond to those new circumstances. It allows such changes to be made. More broadly, novelty and surprise create conditions that engender fundamental revisions of the objectives themselves. New possibilities evolve that, if realized, can potentially improve the situation beyond what agents previously thought possible. A corollary is that agents will seek to revise their goals, and subsequently take positive steps to facilitate the realization of those goals. The revisions made, and the courses of action taken, require that money be used as the means of payment. Seen from this perspective, money allows agents to be creative and to mold the future in a way that is more beneficial to themselves. Thus, firms, banks, and wage earners do not use money only to make reactive moves toward uncertainty, but also as a device to promote their interests, when the unfolding of the unforeseen and unforeseeable affords them the opportunity to do so.
Keynes's "monetary theory of production": a modern view

Keynes explained that economists should propose simple and useful ways to organize economic facts. An economic theory should be little more than an instrument of thought, "an organised and orderly method of thinking out particular problems" (Keynes, 1936, p. 297). Keynes lived in a period of great monetary changes. It was evident that uncertainties were intimately involved with the business of exchange and the business of production, and money was a powerful device used to cope with those uncertainties. Therefore, Keynes emphasized the need for a monetary theory that could explain the way agents regulate exchange and production activities. He also acknowledged that monetary issues were very complex ones and they could not be tackled all at once.

In 1933, Keynes wrote a short contribution to a Festschrift for the German economist Arthur Spiethoff. He there attacked classical economists for not providing an adequate monetary theory. He then embarked upon the development of what he termed a monetary theory of production, a theory in which the interdependence of money and uncertainty, and their effects on economic behavior, could be properly investigated:

The theory which I desiderate would deal, in contradistinction to this [i.e., orthodox analysis], with an economy in which money plays a part of its own and affects motives and decisions and is, in short, one of the operative factors in the situation, so that the course of events cannot be predicted, either in the long period or in the short, without a knowledge of the behavior of money between the first state and the last. (Keynes, 1933, pp. 408–409)

Several decades later, Keynes's monetary theory of production can still be seen as providing the basic vision for a proper understanding of the operation of modern economies (cf., for example, Davidson, 1977, p. 95; de Carvalho, 1992, ch. 3; Rotheim, 1999, pp. 90–95). There are two main lessons to be learned from Keynes's approach to money and uncertainty. Firstly, a modern monetary theory of production should acknowledge that money provides the context for economic behavior, in the sense that firms, banks, and wage earners are in some ways all motivated by monetary rather than commodity returns (cf. Gerrard, 1995, pp. 452–456). Secondly, a modern monetary theory of production should allow for the fact that it is impossible to establish any one set of principles that is broad enough to support a unique theoretical structure. Principles such as "money is non-neutral," or "the world is non-ergodic"
are not adequate without further discussion which clarifies how in a particular institutional setting agents use and hold money in the face of an uncertain future (cf. Dow, 1993; Rotheim, 1999).

Circuitists and Post Keynesians have made the most persevering attempts to carry on Keynes's project of a monetary theory of production. Circuitists and Post Keynesians have explained why agents rely upon money to cope with uncertainty. They have proposed formidable analyses that show how, in modern economies, money is nonneutral. However, the form in which their arguments have been developed is rather different.

Davidson and Post Keynesians in general have pressed into service the role of money as a store of wealth to demonstrate the fault of Say's law. They have mainly seen money as a time machine to transfer purchasing power from the present to the future. Post Keynesians have labored hard on the link between money and uncertainty to single out one particular type of consequence, namely the role and responsibility of money holding in engendering massive increases in the level of unemployment. Does this mean, however, that Post Keynesians do not recognize that in modern economies money is also the means of payment? Certainly not! Davidson, who has been presented as the most consistent and complete expression of the Post Keynesian approach, has never overlooked the functional role of money as the means of payment (cf. Davidson, 1988). On numerous occasions he refers to a passage from the Treatise on Money

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8 Sawyer has recently argued that "Kalecki had a greater appreciation of the role of the monetary sector than has been generally recognised" (Sawyer, 1999, p. 1). He then goes on to show that most of the recent Post Keynesian and Circuitist works on money also reflect Kalecki's approach to money and finance.

9 Davidson argues that the fundamental reason for demanding a liquid time machine under condition of fundamental uncertainty is related to the precautionary motive, or to the speculative motive, depending on the absence, or the presence of well organized spot markets respectively (cf. Davidson, 1977, p. 98, n. 11, and p. 100, n. 14; also Keynes, 1936, pp. 170–171). Moreover, Chick holds that "precautionary money balances are unlikely to be held against major contingencies" (Chick, 1983, p. 197; also Davidson, 1994, p. 114), and suggests that in those cases the liquid time machine is more likely to take a non-money form.

10 Since Davidson emphasizes the intimate link between money and contracts he prefers to talk of money as the means of contractual settlement rather than the means of payment. As Davidson says, money is "that thing [which] by delivery permits economic agents to discharge obligations that are the result of spot and/or forward contracts" (Davidson, 1990, p. 196). Unfortunately, this definition is an unnecessarily narrower conceptualization of money as purchasing power because it ties up any generalized private claim on resources to the use of the existing law of contracts.
where Keynes explains that it is in the nature of money to be the means of payments and a store of wealth (cf. Davidson, 1990, p. 196, n. 1).\textsuperscript{11}

A money of account comes into existence along with debts, which are contracts for deferred payment, and price lists, which are offers of contracts for sale or purchase. . . . Money itself—namely that by delivery of which debt contracts and price contracts are discharged, and in the shape of which a store of general purchasing power is held—derives its character from its relationship to the money of account. (Keynes, 1930, p. 3)

In fact, money acts as a store of wealth because of its role as means of payment (cf. Davidson, 1977, p. 99; 1990, p. 197; Rotheim, 1981, p. 580). Money is a liquid and capital-risk free resource, hence it is an important financial asset in the portfolio of agents. The essence of the primary role of money as the means of payment is strictly related to Clower's famous aphorism that "money buys goods and goods buy money; but goods do not buy goods" (Clower, 1969, pp. 207–208; also p. 289).

The central core of the Post Keynesian analysis is certainly money in its whole entity. However, the focus of the analysis is mainly on the peculiar properties of money as a liquid asset, and its effects on the real side of the economy. As Shackle put it, "money, in its role as the vehicle of consumption expenditure, makes it possible for choice to be deferred until knowledge of needs and opportunities has improved (i.e., has become more exact, complete, or assured)" (Shackle, 1974, p. 62). Money holding represents the possibility of continuously managing the rise of new knowledge. The choice of agents for money rather than for goods and services means that aggregate demand, employment, and output are all negatively affected.

Circuitists have dwelt upon the nature of money as the means of payment. Money is general purchasing power.\textsuperscript{12} It is mainly the flow of bank deposits demanded by firms to finance the production of goods and services. What is peculiar to any firm involved in a production process is the certainty of the initial flow of money for purchasing inputs,

\textsuperscript{11} In an often neglected paper, Davidson goes so far as to acknowledge that the essence of money lies in being the means of payment: "Monetarists . . . have improperly identified the time machine aspect as the essential feature of money and have basically ignored the means of contractual settlement feature—while the latter is the essence of anything which deserves the title of money" (Davidson, 1990, p. 197).

\textsuperscript{12} Whereas Circuitists maintain that the creation and circulation of money involves Keynes’s finance motive, it should be added that the transformation of the flow of money into a stock of money balances is related to the precautionary motive and to the speculative motive, respectively. However, Circuitists seem to focus mainly on the precautionary motive (e.g., Graziani, 1994, p. 82).
against the uncertainty of the final monetary outcome from selling output. Firms want to end up with more money than they start with, but, in a world of uncertainty, they can only have expectations about what the monetary outcome of the process will be. Nevertheless, the necessity for action compels firms to overlook this awkward truth. Then, a flow of means of payment results from banks endorsing the commitment of firms to a positive stream of profits. Again, does it mean, however, that Circuitists overlook the fact that in modern economies money is also a store of wealth? Certainly not! Graziani has recently argued for a more holistic interpretation of the monetary writings of Keynes. He insisted on the need to develop a theory of money as means of payment and store of wealth.

A more complete analysis of Keynes’s writings before and after the General Theory will show that Keynes paid equal attention to money as a form of wealth and to money as an intermediary of the exchanges. (Graziani, 1996, p. 142)

Circuitists have favored an approach to money as the means of payment, but they have not failed to note that the flow of purchasing power is often transformed into a stock of money balances. In fact, Circuitists have explained that for any given production process an increase in money holding by wage earners is exactly the same as a loss of liquidity, and hence an equivalent increase in bank debts, by firms. The focus of the Circuitist analysis is on money as the means of payment, but the possibility that money holding may have deleterious effects on the balance sheets of firms and banks is a reminder of the fact that money as a store of wealth is nevertheless at the core of the analysis. Thus, what Post Keynesians record on the real side of the economy, Circuitists assess on the monetary side of the production process.

Combining Post Keynesians with Circuitists, it is clear that both groups of scholars have elaborated upon Keynes’s approach to money and uncertainty. First, Post Keynesians and Circuitists have demonstrated that the existence of money is intimately related to the working of the economic system. It gives precise content to the behavioral functions of all economic agents. As money is mainly used to cope with the uncertainties that characterize modern exchange and production activities, Post Keynesians and Circuitists have put forward an analysis of the complex links between uncertainty and money.

What are at stake here is the size rather than the timing of those flux and reflux of means of payment (cf. Kregel, 1976, pp. 223–225).
Second, Post Keynesians and Circuitists have recognized that no one set of principles is broad enough to support a unique theoretical structure. Post Keynesians have privileged one aspect of money, whereas Circuitists have favored another one. Nevertheless, what is important is that both approaches accept that in a truly monetary theory of production no single function can be described as the key function. Any one aspect of money cannot stand on its own as a complete account of what money does in a modern economy. Rather, if anything is key in what Circuitists and Post Keynesians have proposed, it is the way in which uncertainty is combined with the real and the monetary sectors to prove that money is nonneutral.

Summary and conclusions

Drawing on the original insights of Keynes, Post Keynesians and Circuitists have been in the front line to champion the view that money matters. Against the main precepts of orthodox monetary theory, they hold that money is not neutral either in the short or in the long run. However, on the issue of when, why, and how money is nonneutral, some controversy remains.

Davidson and Post Keynesians in general have emphasized that money is a liquid store of wealth held by agents to provide an escape route from an uncertain future. In terms of what money does, it allows the transfer of purchasing power from the present to an indeterminate future. Post Keynesians have focused on the often neglected fact that agents are stultified by uncertainty to the point where they are unwilling to spend. The demand for an abode of purchasing power breaks down Say's law and demonstrates the limits to the profitable expansion of output below full employment. Yet this is only a partial monetary analysis. Money assumes roles beyond being a mere store of wealth that reinforce its nonneutral effects upon the economic system.

Circuitists have stressed that in modern economies money serves as the means of payment. In terms of what money does, it allows the starting and the development of the circuit of production and circulation of goods and services. However, Circuitists have often played down the effect of uncertainty on the economic behavior of agents. This is very unfortunate because it is precisely the unfolding of the economic process under a condition of uncertainty that explains the use of money as means of payment. In fact, once it is related to the Circuitist view of the production process, uncertainty makes agents eager to undertake transactions, even if only to respond to the constantly changing environment
around them. Uncertainty need not always lead to inertia, but may pro-
vide the stimulus for action. Money as the means of payment assumes
importance because it allows agents to accomplish the necessary trans-
actions that enable them to accommodate unexpected changes.

The intimate and complex link between uncertainty and money im-
plies that there is an urgent need to build a more general monetary theory
that allows for money being store of wealth and means of payment. This
paper has suggested that the Post Keynesian and the Circuitist analyses
of money can play a leading role in that project. What is more important
is to recognize that to establish any one set of principles that are broad
enough to support a unique theoretical structure is almost impossible.
Post Keynesians and Circuitists can be seen as having accepted that in
modern economies money carries out several complex functions. Hence,
they have decided to analyze, and work out in detail, the implications of
some, rather than all, of the complex functions of money. Thus, the rec-
ognition of the multiple roles played by money in the economy revives
Keynes's own concern with the formulation of a monetary theory of
production. Money is an important device to meet and alleviate the prob-
lems of exchange and production under conditions of uncertainty. Post
Keynesian and Circuitist analyses have fostered sound thinking on when,
why, and how money does this.

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