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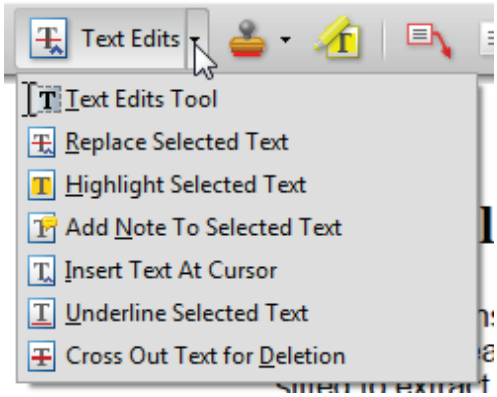

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On Keynes's Criticism of the Loanable Funds Theory

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ABSTRACT *By accepting the claims of the loanable funds theory, contemporary monetary theory distances itself from Keynes's view of the rate of interest as a monetary phenomenon, and overlooks the arguments Keynes used to respond to the criticism of supporters of the loanable funds theory such as Ohlin and Robertson. This paper argues that the explicit consideration of the finance motive and the role of banks in financing investment does not imply acceptance of the loanable funds theory, but instead facilitates the elaboration of an alternative to the loanable funds theory. Associated with this alternative theory of credit is an explanation of the monetary nature of the fluctuations in income and employment, which is different from and more persuasive than accounts based only on the liquidity preference theory.*

1. Introduction

The loanable funds theory (hereafter LFT) has met a paradoxical fate. Although the fundamental elements of this theory have been accepted in mainstream monetary theory, few contemporary economists refer to it explicitly. An important exception can be found in Michael Woodford's (2003) *Interest and Prices*, which in its very title draws an explicit link to Wicksell's work. Woodford points out that Wicksell's monetary theory constitutes the theoretical foundation of the strategy adopted in recent years by the central banks of western countries, i.e. pursuing the objective of price stability through a monetary policy rule based on interest rate manoeuvre. Central banks use the Wicksellian distinction between the rate of interest on money and the natural rate of interest to affirm that monetary policy can only influence short-term interest rates, while in the long run interest rates are determined by real factors (see, for example, European Central Bank (ECB), 2004, pp. 57–58). An explicit reference to the LFT can, moreover, be found in the works of the New Keynesians, who set out to re-elaborate the Keynesian monetary theory by focusing on the credit market rather than the money market (see Stiglitz & Greenwald, 2003). Post Keynesians too, have noted the common strands between the mainstream view of monetary policy, based on

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Wicksell's theory, and the endogenous money theory (see Fontana, 2007; Rochon & Setterfield, 2007).

Contemporary monetary theory, by accepting the claims of the LFT, distances itself from Keynes, who viewed the rate of interest as an exclusively monetary phenomenon; it also overlooks the arguments Keynes put forth, following publication of the *General Theory*, in response to the criticism levelled at his book by supporters of the LFT such as Ohlin and Robertson. In the face of these criticisms Keynes acknowledged that in the *General Theory* he completely neglected to consider either the financing of investment decisions or the process of money creation carried out by banks. He believed it would be possible to overcome this shortcoming without necessarily having to accept the view of the supporters of the LFT, according to which savings determine investment spending and the interest rate. As is well known, the solution elaborated by Keynes is to specify a new motive that justifies the demand for money—the finance motive. Contemporary monetary theory seems to have accepted the approach of Tsiang (1980), who interprets the finance motive as a substantial concession by Keynes to the LFT, a concession that cancels the revolutionary content of the *General Theory*. The dominant view, as expressed by Leijonhufvud (1981, pp.195−196), is that: 'the rate of interest *will* go to the … "natural" level, and thus equate full employment saving and investment…' In other words, modern monetary theory seems to have cancelled the Keynesian Revolution which, by highlighting the monetary nature of the interest rate, asserted the principle of the non-neutrality of money. AQ1

The aim of this paper is to clarify the importance of the arguments Keynes used to rebut the criticism Ohlin and Robertson levelled at the liquidity preference theory. Keynes sought to refute the supporters of the LFT and to assert the validity of the liquidity preference theory. We shall show that Keynes's arguments make it possible to elaborate an explanation of the monetary nature of the fluctuations in income and employment, which is different from and more persuasive than the explanation based solely on the liquidity preference theory. An important aspect of this alternative explanation concerns the causal relation between money and uncertainty: according to the liquidity preference theory, uncertainty is the exogenous element that justifies the store of wealth function of money. It will be shown that in his 1933 writings Keynes defined the causal link between money and uncertainty inversely to that which characterises the liquidity preference theory and that the arguments he employed in replying to Ohlin allow us to explain why the presence of money constitutes the necessary condition for the uncertainty dimension to become relevant. This inversion of the causal relationship between money and uncertainty, we shall see, does not imply the abandonment of the theory of liquidity preference, but in fact grounds Keynes's emphasis on uncertainty, which is necessary to explain the phenomena of wealth accumulation and speculation.

In Section 2 the most important aspects of the LFT are described, taking Wicksell as a reference point. This is the theory from which Keynes deviates in the *General Theory*, abandoning the concept of the natural rate of interest and elaborating the liquidity preference theory. In Section 3, after recalling the main aspects of the criticism made by Ohlin and Robertson against the liquidity

preference theory, we describe Keynes's reply to this criticism. Section 4 shows that the reasoning Keynes uses to respond to the criticisms by LFT supporters makes it possible to formulate a sound explanation for the characteristics of a monetary economy and for the non- neutrality of money.

2. The Loanable Funds Theory

We shall focus on the aspects of the LFT necessary to understand: (i) the reasons why Keynes abandoned the concept of natural rate of interest; (ii) Ohlin's and Robertson's critiques of Keynes's interest rate theory; and (iii) Keynes's response to these critiques. These aspects of the LFT can be illustrated by taking Wicksell as a reference point. Wicksell's theoretical reference point is the Quantity Theory of Money. His objective is to explain the causes of price fluctuations; he maintains that the version of the Quantitative Theory of Money elaborated by Ricardo is perfectly valid if it is applied to an economic system where: 'everybody buys and sells for cash and with money on their *own*, that is to say, neither commodity credits nor money loans exist' (Wicksell, 1898, p. 73). AQ2

Wicksell notes that the presence of bank money alters the characteristics of the functions of money supply and demand. In a world in which money is either metallic money or banknotes issued by the central bank, every individual must acquire a stock of money to finance transactions; therefore, to demand money means to accumulate a store of cash. In this case, the functions of money demand and supply are independent: the quantity of money in circulation may be different from the quantity of money demanded, and the difference between these quantities will cause a variation in the price level, according to the Quantity Theory of Money. Wicksell points out that in a bank money world, to demand money does not mean to accumulate stores of money, but rather it means demanding means of payments from the banks. In this case, money becomes an endogenous variable because whoever desires money to purchase goods will be able to obtain it by becoming indebted to the banks; therefore, inflation cannot be caused by an exogenous variation in the quantity of money (see Wicksell, 1898, pp. 75 − 76).

In a pure credit economy the price level does not depend on the gap between money demand and supply but rather on the price of money, that is, on the rate of interest that must be paid to obtain money. Wicksell observes that the concepts of 'high' and 'low' interest rates are not absolute concepts but must be defined in relation to a term of reference that he calls the natural rate of interest. The natural rate of interest is the rate that would be obtained in an economy without banks and without bank money and which contains a credit market within which capital goods would be directly exchanged.[1]

[1]The natural rate of interest is defined by considering 'the phenomena of capital and interest on capital, as they would appear if liquid capital, production's means of support, was in reality lent in kind, without the intervention of money; and only then is it possible to distinguish what modifications are in reality caused by the introduction of money. In the former case, i.e. if capital was lent in kind, there would undoubtedly develop, through

Wicksell thus concludes that the natural rate of interest has an important role even in a bank money world in which capital goods are not exchanged in kind but are purchased using money. In a world without bank money the capital market coincides with the credit market; in a pure credit economy the credit market and the capital market are two distinct markets within which two different rates of interest are determined: the rate of interest on money and the natural rate of interest. Wicksell stresses that the capital market and the natural rate of interest are not observable variables, but just theoretical entities, and that the money market, which characterises a pure credit economy, is not the pure reflection of what happens in the capital market of a world without money. The two rates of interest may therefore be different, and Wicksell states that only in the case where the rate of interest on money is equal to the natural rate of interest does the money market coincide with the capital market and the presence of bank money does not alter the structure of the economic system. If the rate of interest on money is different from the natural rate there will be continuous price fluctuation; if the monetary rate is lower than the natural rate there will be continuous price increases caused by the rise in demand for new capital goods. The contrary process will arise where the rate of interest on money is higher than the natural rate of interest.

Wicksell wonders what factors determine the gap between the two rates. Observing that once the banks have fixed the rate of interest, they have no obvious reason to modify it, Wicksell concludes that the difference between the two rates of interest is caused by the variations in the natural rate of interest. Finally, Wicksell notes that the process of price fluctuations caused by the gap between interest rates cannot last long; neither the individual bank nor all the banks together can maintain the monetary rate of interest at a different level than the natural rate for long.

3. Keynes's Criticism of the Loanable Funds Theory

3.1. Ohlin's Criticism of the Liquidity Preference Theory

In the *General Theory* Keynes (1936, pp. 242−243) elaborates a theory of the interest rate which is alternative to Wicksell's theory; Keynes abandons the concept of the natural rate of interest and highlights the monetary nature of the rate of interest.

In Chapter 13 of the *General Theory* Keynes states that the interest rate cannot be the reward for abstaining from consumption because the saver can decide to use the non-consumed income to accumulate money; in this case, even though he is saving, he does not receive any interest income. Thus, Keynes (1936, p. 167) concludes that the rate of interest, 'being the reward for parting with liquidity, is a measure of the unwillingness of those who possess

the supply of and the demand for available capital, a certain rate of interest on the lending market, which would be the natural rate of interest on capital in the strictest sense' (Wicksell, 1898, p. 84)

money to part with their liquid control over it.' He specifies that the relation between liquidity preference and the rate of interest is based on a necessary condition: the presence of uncertainty about the future rate of interest. The presence of uncertainty allows Keynes to highlight a key aspect of the money demand function: its instability. The consequences of the fluctuations in liquidity preference depend on the characteristics of the money supply function; in the *General Theory*, Keynes assumes that the quantity of money is controlled by the monetary authorities and that it can vary independently of the demand for money. He can therefore conclude that the fluctuations in liquidity preference do not cause changes in the quantity of money but that they influence the level of the interest rate. Given the quantity of money, the rate of interest depends on agents' expectations about the future level of the interest rate; this implies that the rate of interest could be different from the level that would be compatible with Say's law.

The theory of the interest rate presented by Keynes in the *General Theory* was criticised by Bertil Ohlin and Dennis Robertson, both of whom supported the LFT. For the sake of concision we shall focus on Keynes's exchange with Ohlin, which covers similar ground to the debate with Robertson. Ohlin criticised Keynes's assertion that within the classical theory a decision to save necessarily gives rise to an equivalent amount of investment spending. Starting with Wicksell, Ohlin argues, economists recognised that saving decisions do not necessarily translate into investment decisions since, as Keynes himself observed, a saver may decide to accumulate money. Moreover, in line with Keynes, Ohlin accepts that the interest rate is associated with a credit contract by means of which it is not the saved resources that are exchanged, but rather the money available today against money available in the future. However, following Wicksell, Ohlin notes that the object of the credit contract is not just the existing money but also the new money created by the banks. The demand and supply functions for loanable funds are for Ohlin *ex ante* concepts because they express, as with any commodity, 'the planned sales and purchases at different possible prices during a certain future period' (Ohlin, 1937c, p. 423).

Ohlin specifies the factors that influence the supply and demand curves for credit. First of all, he points out that there is a close connection between the curves that define saving and investment decisions and those that represent the supply and demand for credit. He acknowledges that the planned supply of credit does not necessarily coincide with the planned savings since 'it is possible to plan to save and to increase the quantity of cash instead of lending' (Ohlin, 1937c, p. 425). If we admit that savers may decide to accumulate money, we must conclude that the credit supply may increase independently of the saving decisions due to the decision of savers to reduce their stock of money. Finally, Ohlin asserts that the banking system has an important role in determining the supply of credit independently from saving decisions; he concludes that the interest rate is determined within the credit market and is influenced by all the factors that determine the *ex ante* supply and demand curves for credit. The loanable funds supply corresponds to the sum of the flow of savings (S) and the flow of new money created by the banks (ΔM), net of the variation of the stock of accumulated money (ΔH), while the demand for loanable funds corresponds to the flow

in investments (*I*). Once the relation between saving decisions and interest rate is confirmed, the concept of the natural rate of interest—'the rate at which the new lendings which can be absorbed by industry per atom of time and the new available savings per atom of time are equal' (Robertson, 1934, p. 651)—is recovered.

3.2. Keynes's Response to Ohlin

Keynes (1937b, 1937c) replied to the critiques of Ohlin and Robertson with the objective of defending his thesis about the monetary nature of the rate of interest. Keynes's strategy consists, on the one hand, of accepting some elements of Ohlin's analysis and, on the other, of reiterating the independence of the interest rate with respect to saving decisions. In the face of Ohlin's criticism, Keynes (1937c, p. 216) acknowledged the importance of the concept of *ex ante* investment; he recognised that entrepreneurs must obtain liquidity to finance the costs of planned investment projects, and he therefore saw a close link between investment decisions with the demand for credit. Although he rejected Ohlin's thesis that the credit supply depends on *ex ante* savings (Keynes, 1937c, p. 217), he recognised the role of banks in creating new money. Not only did Keynes accept an important point of the LFT, but he used the presence of banks to underline, in contrast with the LFT, that the demand for credit is satisfied by means of the creation of money by banks and not by savings (Keynes, 1937c, p. 222).

To highlight the distance between his theory and Ohlin's, Keynes distinguished the market for money from the credit market and noted that in his theory the rate of interest is determined in the market for money. Indeed, Keynes considered 'finance', that is firms' demand for liquidity for the purpose of financing investment decisions, to be a component of the demand for money (Keynes, 1937c, pp. 209−210). This line of reasoning enabled Keynes explicitly to take account of the financing of investment without contradicting the argument of *The General Theory*; he could therefore concede that he had made a mistake by overlooking this issue (Keynes 1937c, p. 220). Keynes's specification of the finance motive has given rise to much commentary (see Asimakopulos, 1991; Bertocco, 2005; Bibow, 1995; Chick, 1997; Graziani, 1984), but for the purposes of our analysis, it is mainly important to emphasise that Keynes's market for money has the same characteristics as the loanable funds market described by Ohlin and Robertson.[2]

Tsiang (1980) contends that with the introduction of the finance motive, Keynes in effect accepted the conclusion of the LFT about the relation between saving decisions and rate of interest. Tsiang supports this claim by adopting and

[2]See Robertson (1938, p. 317): 'I nourish a hope that [Mr. Keynes] will yet come to agree that analysis in terms of supply and demand for money-to-hold at a moment of time, and analysis in terms of supply and demand for money-to-lend during an interval of time, are *alternative* methods of procedure; and that, while neither is more than a first stage in the elucidation of the underlying forces governing the behaviour of the rate of interest, either, *if carried through consistently,* will give the same result as the other.'

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widening Keynes's definition of the finance motive, noting that the demand for money depends not only on planned investment, but also on planned consumption expenditures.

Tsiang accordingly rewrites the demand for money function as:

$$M_t^d = k_t(C_t^p + I_t^p) + L(r_t, W_t) \tag{1}$$

where C_t^p and I_t^p are current planned consumption and investment expenditures, r_t the current rate of interest, and W_t the current value of total wealth. The demand for money in period $t-1$ is:

$$M_{t-1}^d = k_{t-1}(C_{t-1}^p + I_{t-1}^p) + L(r_{t-1}, W_{t-1}) \tag{2}$$

Tsiang further specifies that the income of the previous period is equal to the planned spending on consumption and investment realised in that period; therefore, the following relation applies:

$$Y_{t-1} = C_{t-1}^p + I_{t-1}^p \tag{3}$$

From these relationships we can obtain:

$$\Delta M_t^d = M_t^d - M_{t-1}^d = k_t(C_t^p + I_t^p) - k_{t-1}Y_{t-1} + L(r_t, W_t) - L(r_{t-1}, W_{t-1}) \tag{4}$$

If for simplicity we assume that $k_t = k_{t-1} = 1$, we get:

$$\Delta M_t^d = I_t^p - (Y_{t-1} - C_t^p) + L(r_t, W_t) - L(r_{t-1}, W_{t-1}) \tag{5}$$

Therefore the equilibrium condition in the market for money, expressed in flow terms, is:

$$\Delta M_t^s = \Delta M_t^d = I_t^p - (Y_{t-1} - C_t^p) + L(r_t, W_t) - L(r_{t-1}, W_{t-1}) \tag{6}$$

Following Robertson, Tsiang treats the flow of savings $(Y_{t-1} - C_t^p)$ in equation (6) as independent of the investment decisions, since it depends on the income of the previous period. Since in this equation a change in the propensity to save influences the rate of interest, Tsiang concludes that it is not possible to speak of a Keynesian Revolution, for Keynes failed to demonstrate that the conclusions of the LFT are unfounded: 'Everything that Robertson tried to tell us is quite right. In particular, what has become the central issue of contention, viz, the question whether a change in thrift (or propensity to save) will have a direct effect on the rate of interest, should clearly be decided in favour of Robertson' (Tsiang, 1980, p. 474). The connection between saving decisions and the rate of interest allows the supporters of the LFT to apply the concept of the natural rate of interest to a pure credit economy and to maintain that this economy converges towards the equilibrium position that characterises an economy that does

not possess a credit money; the only element that characterises a pure credit economy is the presence of an adjustment mechanism that drives the rate of interest on money towards the natural rate of interest.

On Tsiang's reading, Keynes's attempt to formulate a new theory that considers the fluctuations in income and employment as phenomena of a monetary nature must be considered unsuccessful: the liquidity preference theory does not seem to be able to withstand the critiques of the LFT supporters. Moreover, Keynes's response to his critics seems neither to sever the link between saving and the rate of interest nor to undermine the concept of the natural rate of interest. The LFT remains the theoretical foundation of monetary policy in developed economies.

The aim of the present paper is to show that the arguments Keynes used in his response to the LFT supporters' criticism allow us to develop a theory that Keynes characterised in his 1933 writings as a monetary theory of production, i.e. a theory in which money is the crucial element to explain crises and fluctuations in income and employment.

The first element of Keynes's critique of the LFT consists of stressing that in an economy where money is used, savings decisions are not substantially different from spending decisions as sources of the supply of credit. A few years after the publication of *The General Theory*, Keynes explained his reasoning in a criticism of how the Committee of Statistical Experts, starting from the LFT, analysed the process of capital formation:

> According to the Committee funds for investment can only become available either from prior saving or from dishoarding and credit expansion. . . . The Committee have overlooked the fact that *spending* releases funds just as much as saving does, and that these funds when released can then be used indifferently for the production either of capital goods or of consumption goods. . . . Money which is spent on prior consumption flows into the same pool of available funds as money which is saved . . . As soon as it is understood that the available funds arise from the *whole* of the money income earned at a previous date, whether saved or spent, supplemented by dishoarding and credit expansion, and are then employed for the *whole* of production . . . at the subsequent date whether for investment or for consumption. . .their schematism breaks down completely in so far as it purports to relate the funds arising from savings at a previous date to the funds required for investment at a subsequent date. (Keynes, 1939, pp. 572−573)

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Supporters of the LFT, Keynes argued, commit an error of logic in applying to a world in which money is used and in which incomes are paid in money, the relations that hold in a one-good economy in which salaries are paid in kind. In the latter case, saving means not only deciding not to consume a part of the income constituted by the only good produced, but also to use this good as a means of production. Consumption decisions entail the destruction of resources already produced, while saving consists of removing from consumption a part of the resources already produced in order to use them for the expansion of future production. Keynes suggests that these definitions of consumption and saving have been improperly applied by the LFT to a world in which money is used; according to the LFT, only money that is saved can support investment,

and it is implicitly assumed that the money that is used to purchase consumer goods is destroyed and meets the same fate as the goods that are consumed. But the money that is used to purchase consumption goods does not disappear from circulation, just as the saved money does not disappear, and it is not clear, for example, why the money used to purchase goods cannot be used to finance investment decisions (see Maclachlan 1993, p. 143).[3]

The second element of Keynes's critique of the LFT can be found in his analysis of the effects of the presence of bank money. Wicksell and the adherents to the LFT acknowledge that banks create money and, therefore, that the supply of credit may vary irrespectively of saving decisions, but they argue that this does not change the structure of the economy since the rate of interest on money must gravitate toward the natural rate of interest. Keynes's insistence, in the face of Ohlin's comments, that there is no causal relation running from saving decisions to the supply of credit and hence to the interest rate reflects his conviction that when money is present, consumption, saving and credit acquire different meanings from those assigned to them by the LFT. We will show that bank money constitutes the required element in order to develop what Keynes called a *monetary theory of production*. Keynes's argument can be sustained only if it is shown that the presence of bank money influences the structure of the economy, turning a *real exchange economy* into a *monetary economy*.

Several years before the publication of *The General Theory*, Keynes (1933a, 1933b) outlined his theory of non-neutrality of money by specifying the distinction between a monetary economy and a real exchange economy. He used the former term to refer to an economy in which money is merely a tool to reduce the cost of exchange and whose presence does not alter the structure of the economic system, which remains substantially a barter economy. A *monetary economy* instead refers to an economic system in which the presence of fiat money radically changes the nature of exchange and the characteristics of the production process. We will argue that the presence of bank money permits us to explain three fundamental features of a monetary economy: (i) the importance of uncertainty; (ii) the importance of wealth accumulation and speculation; and (iii) crises and fluctuations in income and employment.

4. The Characteristics of a Monetary Economy

4.1. Money and Uncertainty

The existence of bank money is what accounts for the central role of uncertainty in market economies. Hints of this causal relation between money and uncertainty can be found in Keynes's 1933 papers. In these writings Keynes observes that in a monetary, or entrepreneurial, economy the presence of money changes the character of production compared with the economic system described by the

[3] In his reply to Robertson's criticism, Keynes (1938, p. 233) argued that 'Saving has no special efficacy, as compared with consumption, in releasing cash and restoring liquidity.'

classical theory. He illustrates this thesis by adopting a framework described by Marx:

> [Marx] pointed out that the nature of production in the actual world is not, as economists seem often to suppose, a case of C−M−C′, i.e. of exchanging commodity (or effort) for money in order to obtain another commodity (or effort). That may be the standpoint of the private consumer. But it is not the attitude of *business,* which is a case of M−C−M′, i.e. of parting with money for commodity (or effort) in order to obtain more money. This is important for the following reason. The classical theory supposes that the readiness of the entrepreneur to start up a productive process depends on the amount of value in terms of product which he expects to fall to his share; i.e. that only an expectation of more *product* for himself will induce him to offer more employment. But in an entrepreneur economy this is a wrong analysis of the nature of business calculation. An entrepreneur is interested, not in the amount of product, but in the amount of *money* which will fall to his share. He will increase his output if by so doing he expects to increase his money profit, even though this profit represents a smaller quantity of product than before. (Keynes, 1933a, 81−82;)

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The objective of the entrepreneur is not to produce goods but to make money by selling them. This would seem to be an obvious truth, but it must be emphasised that the distinction between the production phase and the sale phase has no significance in a one-good economy, since we may assume in this case that whatever is produced will be used as a consumer good or an investment good. The necessary condition to make this distinction relevant is that more than one good is produced, in which case our entrepreneur will not be interested in accumulating the physical goods his workers produce, but in obtaining a monetary profit from the sale of those goods.

The presence of numerous goods is a necessary but not a sufficient condition. If our entrepreneur could be certain of selling all the units his firm produced, and of selling them at a price that would deliver a reasonable rate of profit, we would again find ourselves in what Keynes calls a *real-exchange economy* in which money is merely a means of exchange; that is, a neutral variable. The distinction between the production phase and the sale phase becomes relevant in a world in which the entrepreneurs are not sure of selling everything they produce. The fundamental question is to explain what makes the uncertainty about monetary profits relevant. Keynes proposes to show that the presence of this uncertainty depends on the characteristics of money. In fact, Keynes uses Marx's 'formula for capital' to highlight the fact that what distinguishes a real-exchange economy (characterised by the circuit C−M−C) from a monetary economy (characterised by the circuit M−C−M′) is not the mere use of money but the fact that in a monetary economy the presence of a money that has particular characteristics changes the nature of the monetary proceeds. In the economic system described by the classical theory, the marginal proceeds coincide with the marginal productivity of labour as firms are sure that they will sell everything they produce. In a monetary economy the marginal proceeds do not coincide with the marginal productivity of labour but with 'the amount of money which will fall to [the entrepreneur's] share' (Keynes, 1933b, p. 81). This relation between uncertainty and money that has certain characteristics is explained in the first place, according to

Keynes, by the fact that uncertainty about revenue is due to fluctuations in effective demand.[4]

Secondly, Keynes (1933b, p. 85) describes the fluctuations of effective demand that give rise to booms and depressions as 'a monetary phenomenon' in as much as these fluctuations depend on the particular characteristics of money used in a monetary economy. In Chapter 17 of the *General Theory*, two essential properties of money are defined: (a) zero elasticity of production; and (b) zero elasticity of substitution between liquid assets and reproducible goods. The first property refers to the fact that entrepreneurs cannot cause more money to be produced by hiring additional labour. By the second property, Keynes means that 'as the exchange value of money rises there is no tendency to substitute [producible goods] for it' (Keynes, 1936, p. 231). It is the presence of this particular money that, as we have seen, Keynes—in his works published between 1937 and 1939—identifies with bank money, which makes fluctuations in aggregate demand possible.

The causal relation between money and uncertainty is based on two points. The first is the relation between investment decisions and uncertainty; the second is the relation between money and investment decisions. The relation between investment decisions and uncertainty can be explained by recalling that Keynes (1937a) accuses the classical theory of having overlooked the dimension of uncertainty, and claims that this theory is able to describe only a world without uncertainty, that is an economy in which consumption decisions prevail and decisions about investment and wealth accumulation, whose results are not predictable in probabilistic terms, are absent. It would be inaccurate to claim that the classical theory describes an economic system based only on consumption decisions; instead, what divides the classical theory from the Keynesian theory is the specification of the characteristics of investment decisions. The classical theory considers investments as a phenomenon that depends on saving decisions and is independent of the presence of bank money.

It is of course the case that even within the context of the classical theory, entrepreneurs may not be able to predict in probabilistic terms the future results of their decisions, because of extra-economic factors such as unfavourable climatic conditions that ruin the harvest, or socio-political events such as the outbreak of a war, and so forth. What distinguishes the investments that are made in a monetary economy is that the impossibility of predicting their results in probabilistic terms is due to factors of an economic nature, that is, to factors that make the distinction between the production phase and the sale phase relevant. This

[4] 'The explanation of how output which would be produced in a co-operative economy may be "unprofitable" in an entrepreneur economy, is to be found in what we may call, for short, *the fluctuation of effective demand*. . .. In a co-operative or in a neutral economy, in which sale proceeds exceed variable cost by a determinate amount, effective demand cannot fluctuate.. . . But in an entrepreneur the fluctuations of effective demand may be the dominating factor in determining the volume of employment. . .' (Keynes 1933b, p. 80;).

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becomes evident when we consider the examples of investment decisions used by Keynes:

> Our knowledge of the factors which will govern the yield of an investment some year hence is usually very slight and often negligible. If we speak frankly, we have to admit that our basis of knowledge for estimating the yield ten years hence of a railway, a copper mine, a textile factory, the goodwill of a patent medicine, an Atlantic liner, a building in the City of London, amounts to little and sometimes to nothing; or even five years hence. (Keynes, 1936, pp. 149 − 150)

The future yield of a railway, a copper mine or an Atlantic liner are not foreseeable because in these cases the production phase does not coincide with the sale phase. For example, the entrepreneur who constructs the railway cannot know how many tickets he will be able to sell and at what price. Such investments have the same characteristics as the innovation that Schumpeter (1934) identified as the fundamental endogenous factor that brings about the process of change within a capitalist economy. The Keynesian entrepreneur coincides with the Schumpeterian entrepreneur: he is the agent through which firms launch new products, modify the productive process and open new markets.[5]

We can distinguish at least two types of innovations: innovations that modify the productive process through which the existing goods are realised; and innovations by means of which new goods are produced. The relation between investment decisions, innovations and uncertainty becomes important when the second type of innovation is introduced. The entrepreneur who produces a new good is not at all sure that he will be able to sell all of the output at a satisfactory profit because the innovation alters the existing world, making it very difficult to predict the reaction of the consumers to the new proposal (Schumpeter, 1934, p. 65). Both Keynes and Schumpeter note that, for this reason, investment decisions and innovations are typically undertaken by agents who have particular skills, that is, by managers who are presumed to be skilled at taking decisions in conditions of uncertainty, guided by what Keynes called animal spirits.[6]

We can associate the two types of innovations with the two types of economies described by Keynes. A real exchange economy is an economy in which few goods are produced and innovations serve only to improve the productivity of labour with which those given types of goods are produced; it is an economy in which the conditions of the classical theory hold, i.e., in which saving determines investment, and money is only a medium of exchange. A monetary economy, however, is one in which the second type of innovation can occur: many kinds

[5]The integration of Keynes's theory of income determination with Schumpeter's theory of economic development has been advocated by, among others, Goodwin (1993), Minsky (1986, 1993), and Vercelli (1997). For a detailed analysis see Bertocco (2007).

[6]Schumpeter (1934) had already noted that the introduction of innovations required very different capabilities from those required to run existing firms, and he described the decisions of the innovating entrepreneur in terms similar to those used by Keynes (see Bertocco, 2007).

of goods are produced, and investment decisions are associated with uncertainty, as the entrepreneur cannot be sure that he will be able to sell what he produces.

The second step of the relationship between money and uncertainty is the relation between money and investment decisions. To explain this relation we can observe that both the Keynesian entrepreneur and the Schumpeterian innovator-entrepreneur require access to resources to carry out their investments; bank money enables them to obtain these resources.

Let us consider a real exchange economy in which an entrepreneur, following his animal spirits, plans to build a railway, the construction of which requires the employment of a certain number of workers for ten years. The construction of the railway would have to be financed by the producers of wage goods, who advance to our entrepreneur the wage goods necessary to sustain the workers involved in building the railway. In return, they receive debt claims that will give them, when the railway is built, the right to obtain a quantity of wage goods equal in value to the amount lent during construction plus a premium consisting of the interest.

There is at least one fundamental element that impedes the realisation of this credit contract. It is the fact that it is very difficult for the lenders, i.e. the producers of wage goods, to assess whether the entrepreneur who plans to construct the railway will be able to return the loaned capital. Indeed, the credit contract necessary to finance the construction of the railway is very different from the one that would be made in a one-commodity economy, where the lender gives the excess output over the amount he intends to consume to another producer who will use it as an input to produce more of the good than he could produce using only his own surplus. Given the production technique, it is a simple matter in this case for the creditor to calculate the yield of the loaned corn and thus to determine the rate of interest to charge the borrower; in the case of the railway this evaluation is much more difficult because there is no physical law that makes it possible to calculate what quantity of wage goods will be obtained by the sale of train tickets starting from the quantity of wage goods advanced to build the railway.

The construction of the railway becomes easier in a world in which bank money is used. In this case our entrepreneur will have to convince the banks, not the producers of wage goods, of the profitability of his project. The banks will finance the construction of the railway by creating new money with which our entrepreneur will pay their workers. Although the wage goods sector sustains the workforce over the production cycle, the producers of those wage goods are not creditors of our entrepreneur who is instead in debt to the bank, which is in turn in debt to those who own bank money.

Banks therefore carry out a key role in a monetary economy: they evaluate the applications for financing presented by entrepreneurs. The banks share with the entrepreneurs the responsibility of deciding which investments are carried out; their decisions influence the development of the economic system. Their role is very different from what it would be in a real exchange economy, in which they merely facilitate the transfer of the surplus wage goods of some producers to other producers who intend to expand their production. For Keynes, bank money radically changes the structure of the economic system. It is the

necessary condition for the development of a monetary economy, in which the dimension of uncertainty becomes important because production decisions are not automatically transformed into income since the entrepreneur must succeed in selling what he produces. It follows that in a monetary economy uncertainty is not merely an exogenous dimension, but is a factor whose presence is explained by the spread of bank money.

4.2. Money, Wealth and Speculation

Wealth accumulation and speculation constitute the second distinctive feature of a monetary economy. These two phenomena can be explained by considering the elements that have allowed us to illustrate the relationship between money and uncertainty.

The presence of money makes it possible to consider savers as wealth holders, that is, to hypothesise the presence of individuals willing to accumulate an unlimited amount of purchasing power. Keynes (1936, p. 211) notes that 'the act of saving implies... a desire for "wealth" as such, that is for a potentiality of consuming an unspecified article at an unspecified time.' Once the concept of wealth is defined it is possible to describe the phenomenon of speculation. In a world in which investments that have the characteristics described by Keynes are made, we can justify the presence of markets in which long-term bonds and shares are traded. Wealth owners become speculators in that they choose the composition of their wealth depending on their forecasts, formulated in conditions of uncertainty, about prospective gains to be made from bonds, which in turn depend on the future value of the rate of interest. The second type of asset that can be accumulated by savers as an alternative to money is shares. Keynes (1936, Chapter 12) notes that the spread of shares characterises a phase in the development of the modern economy in which the ownership of the firm is divided up among many owners who do not directly manage the firm. In this phase markets develop in which shares and long-term bonds are continuously traded and the figure of the speculator emerges alongside that of the entrepreneur. Keynes (1936, p. 158;) distinguishes between speculation and enterprise by proposing to use 'the term *speculation* for the activity of forecasting the psychology of the market, and the term *enterprise* for the activity of forecasting the prospective yield of assets over their whole life...' The objective of the speculator is to make a capital gain on the basis of his forecasts about the value that the market will assign in the future to the shares and bonds that are continuously traded on the financial markets.

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Hence the specification of the relationship between bank money and uncertainty allows us to explain the presence of the elements necessary for speculation to play a significant role in a market economy.

4.3. Money, Central Bank Policy and Fluctuations of Effective Demand

The relation between bank money, investment decisions and monetary profit makes it possible to explain why in a monetary economy Say's law does not hold and why such an economy is subject to fluctuations in aggregate demand.

In the explanation based on the liquidity preference theory, the central bank can influence interest rates only indirectly through its control of the quantity of money. In a world where bank money is used, the monetary authorities directly set the interest rate at which they finance the banking system; this reinforces their capacity to influence the interest rate upon which firms base their investment decisions. This view is consistent with the approach taken in recent years by the monetary authorities of the industrialised countries. Central banks have abandoned the efforts to control monetary aggregates and instead target short-term interest rates (see Bank of England, 1999; Bindseil, 2004; Fullwiler, 2006; Romer, 2000; Woodford, 2003). But the setting of the short-term interest rate by the monetary authorities will affect households' liquidity preference and long-term interest rates. This makes it more difficult to contend that unemployment can be attributed to the effects of liquidity preference on long-term interest rates. In other words, since expectations about future interest rates are influenced by the short-term interest rate by the monetary authorities (see Wray, 2006, p. 274) we cannot presume that unemployment occurs because agents' liquidity preference determines a value of the interest rate that is higher than what would be consistent with full employment.

This is not to say that speculation does not play a crucial role in explaining crises. The deep economic crisis caused by the financial crisis that followed the collapse in the subprime mortgage market appears to confirm Keynes's thesis that the economic system becomes more fragile 'when enterprise becomes the bubble on a whirlpool of speculation' (Keynes, 1936, p. 159). On the other hand, the very low rates of interest set by the monetary authorities in countries all over the world cast doubt on the claim that the steep rise in unemployment in Europe and the United States was a consequence of excessively high rates of interest caused by an increase in liquidity preference.

We can formulate a different explanation for why Say's law does not apply in a monetary economy that uses bank money. The explanation is based on the relation between bank money, investment decisions and uncertainty that we have described above. Let us begin by observing that investment spending has a double dimension: on the one hand, it is the route by means of which innovations are introduced, and, on the other, it is a significant component of aggregate demand.

In *The General Theory*, Keynes describes this second dimension when he introduces the principle of effective demand. He emphasises that the principle of effective demand is based on the fundamental psychological law that when employment and disposable income increase consumption does not increase to the same extent as income. Therefore, in order for all the production to be sold and a given level of employment maintained, it is necessary for investments, which have the characteristics described by Keynes and Schumpeter, to rise.

The amount of investment depends, first of all, on animal spirits; given the animal spirits, we can distinguish two situations. First, we can assume that there is no non-negative rate of interest at which entrepreneur-innovators are willing to realise a flow of investment consistent with full employment; in this case there will be involuntary unemployment even if the interest rate were zero. Alternatively, we can suppose that a sufficiently low positive rate of interest will gen-

erate a level of investment demand consistent with full employment aggregate income. As we have seen, the LFT states that when banks fix the rate on interest of money at a value that equals the natural rate of interest, the presence of bank money does not alter the economic equilibrium. The same conclusion is reached if we assume that the monetary authorities are able to control the interest rate and to set the level in correspondence with the optimal rate of interest compatible with full employment. This conclusion is based on the assumption that once the rate of interest is set at a level consistent with full employment, the banks will create a flow of new money capable of financing the investments desired by the entrepreneur-innovators; in this case banks function as intermediaries who simply lend their deposits.

This assumption does not necessarily apply in a monetary economy, for the uncertainty connected with the use of bank money also influences the banks' decisions. Banks also take decisions in conditions of uncertainty; hence they, no more than entrepreneurs, can predict in probabilistic terms the future results related to the construction of the railway. They might therefore decide not to finance entrepreneurs' investment plans; that is, they may decide to ration credit if they view the prospects for a given investment project in a less optimistic light than the entrepreneurs. In this case, Say's law cannot be applied, the level of income depends on the effective demand, and the Keynesian inversion of the causal relation between savings and credit is operative.

If we consider the example of the railway, we can distinguish two dimensions of uncertainty: that which conditions the decisions of the entrepreneur-innovator who intends to build the railway, and that relating to the producers of wage goods whose future profits depend on the level of the investments made by the entrepreneur-innovators. This simple example allows us to show that a monetary economy has a continuous need for innovations in order to maintain full employment—since running the railway once it is built will probably not require the same number of workers used to construct it, new innovations will be necessary in order to maintain full employment.

There is one further element that characterises a monetary economy: its fragility. Hyman Minsky (1975, 1980, 1982) emphasised that money is created by means of a credit contract that requires the debtor's commitment to pay back the money received at a certain date. The debtor's ability to do so depends on the success of the enterprise for which he borrowed the money; in our example it depends on the willingness of the public at large to modify its spending patterns by consuming not only the wage goods they'd consumed before the construction of the railroad, but train rides as well. The ability of the entrepreneur-innovator to repay his loan will depend upon his monetary profits, which are a function of the public's consumption of train tickets. The latter, in turn, will depend on aggregate income and therefore on the investment spending of the entrepreneur-innovators.

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