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# On the monetary nature of the interest rate in Keynes's thought.

*Giancarlo Bertocco*

## Abstract

Keynes in the *General Theory*, explains the monetary nature of the interest rate by means of the liquidity preference theory. The objective of this paper is twofold. First, to point out the limits of an explanation of the monetary nature of the interest rate and thus of the non-neutrality of money based on the liquidity preference theory. Second, to present a different explanation of the monetary nature of the interest rate based on the arguments with which Keynes, following the *General Theory*, responded to the criticism levelled at the liquidity preference theory by supporters of the *loanable funds theory* such as Ohlin and Robertson. It is shown that this explanation is consistent with the definition of the non-neutrality of money that Keynes presented in his 1933 works in which he underlines the need to elaborate a *monetary theory of production* (Keynes 1933a, 408) in order to explain the phenomena of the crisis and the fluctuations in income and employment.

## Introduction

In his response to Ohlin's criticism, Keynes defines the rate of interest as: "... a *monetary phenomenon*" (Keynes 1937b, p. 207). To define the rate of interest in this way means, as Smithin (2009) notes, to reject the thesis of the neutrality of money according to which money is only a means of exchange, a mere veil behind which move economic forces such as productivity and thrift, which determine the rate of interest. And therefore it means to maintain that the presence of money changes the nature of interest with respect to a barter economy or, in other words, that the presence of money is a necessary condition to explain the nature and the level of the rate of interest. Keynes in the *General Theory*, explains the monetary nature of the interest rate by means of the liquidity preference theory.<sup>1</sup>

The objective of this paper is twofold. First, to point out the limits of an explanation of the monetary nature of the interest rate and thus of the non-neutrality of money based on the liquidity preference theory. Second, to present a different explanation of the monetary nature of the interest rate based on the arguments with which Keynes, following the

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<sup>1</sup>The liquidity preference theory is still considered a key element of the Keynesian explanation of fluctuations in income and employment; see for example: Maclachlan 1993, Rogers 1989, 1997, Bibow 2006, Tily 2007.

*General Theory*, responded to the criticism levelled at the liquidity preference theory by supporters of the *loanable funds theory* such as Ohlin and Robertson. It is shown that this explanation is consistent with the definition of the non-neutrality of money that Keynes presented in his 1933 works in which he underlines the need to elaborate a *monetary theory of production* (Keynes 1933a, 408) in order to explain the phenomena of the crisis and the fluctuations in income and employment. The paper is divided in three parts. In the first one, the main aspects of the liquidity preference theory are described and then the limits of this theory are highlighted; in the second one, the arguments Keynes uses to reply to the critiques of Ohlin and Robertson are analysed and in the third part, following on from these arguments, a different explanation of the monetary nature of the rate of interest and of the non-neutrality of money is presented.

## **1. A critical analysis of the liquidity preference theory.**

### **1.1 *The liquidity preference theory.***

Keynes starts the *General Theory* by stating that the classical theory is not able to describe the: "... economic society in which we actually live..." (Keynes 1936, 3), given that it deals principally with the: "... distribution of a *given* volume of employed resources between different uses..." (Keynes 1936, 4) and overlooks the phenomenon of the crisis. He asserts that the inability of the classical theory to explain the fluctuations in income derives from the way in which this theory explains the phenomenon of the rate of interest.<sup>2</sup> Keynes presents an alternative interest rate theory capable of explaining why in the presence of an insufficient effective demand to ensure full employment, the rate of interest: "... does not automatically fall to the appropriate level." (Keynes 1936, p. 31). In the second chapter of the *General Theory* Keynes announces that the presence of money is the essential element on which the theory of the rate of interest is founded: "We shall discover... that money plays an essential part in our theory of the interest rate." (Keynes 1936, 32)

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<sup>2</sup> "There is, I am convinced, a fatal flaw in that part of the orthodox reasoning which deals with the theory of what determines the level of effective demand and the volume of aggregate employment; the flaw being largely due to the failure of the classical doctrine to develop a satisfactory theory of the rate of interest." (Keynes, 1934, 489)

In chapter 13 of the *General Theory* Keynes criticises the classical theory that states that the interest rate depends: "... on the interaction of the schedule of the marginal efficiency of capital with the psychological propensity to save." (Keynes, 1936, p. 351) He observes that an individual, after having decided how much to save, must decide: "... in *what form* he will hold the command over future consumption which he have reserved, whether out of his current income or from previous savings." (Keynes 1936, p. 166). Keynes thus states that the interest rate does not depend on saving decisions but on the liquidity preference:

"It should be obvious that the rate of interest cannot be a return to saving or waiting as such. For if a man hoards his savings in cash, he earns no interest, though he saves just as much as before. On the contrary, the mere definition of the rate of interest tells us in so many words that the rate of interest is the reward for parting with liquidity for a specified period. For the rate of interest is, in itself, nothing more than the inverse proportion between a sum of money and what can be obtained for parting with control over the money in exchange for a debt for a stated period of time." (Keynes 1936, p. 167)

The money demand function or, to use Keynes's terminology, the liquidity preference schedule, is defined by considering the store of wealth function of money and by specifying the factors that induce wealth owners to accumulate money; the interest rate is one of these factors. Keynes 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.<sup>3</sup> If there were no uncertainty individuals would not employ money as a store of wealth. Keynes accuses the classical theory of having elaborated a theory of money that completely overlooks the dimension of uncertainty.<sup>4</sup>

The presence of uncertainty allows Keynes to highlight a key aspect of the money demand function: its instability. The consequences of the fluctuations in the 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

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<sup>3</sup> "There is ...a necessary condition failing which the existence of a liquidity-preference for money as a means of holding wealth could not exist. This necessary condition is the existence of *uncertainty* as to the future of the rate of interest, i.e. as to the complex of rates of interest for varying maturities which will rule at future dates." (Keynes, 1936, p. 168)

<sup>4</sup> "Money, it is well known, serves two principal purposes. By acting as a money of account it facilitates exchanges... In the second place, it is a store of wealth. So we are told, without a smile on the face. But in the world of the classical economy, what an insane use to which to put it. For it is a recognized characteristic of money as a store of that it is barren... Why should anyone outside a lunatic asylum wish to use money as a store of wealth?" (Keynes 1937a, pp. 115-6)

authorities and that it can vary independently of the money demand. 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.<sup>5</sup> Given the quantity of money, the rate of interest depends on operators' expectations about the future interest rate level; this implies that the rate of interest could be a different level from that coherent with Say's law:

“It might be more accurate, perhaps, to say that the rate of interest is a highly conventional, rather than a highly psychological phenomenon. For its actual value is largely governed by the prevailing view as to what its value is expected to be. *Any* level of interest which is accepted with sufficient conviction as *likely* to be durable *will* be durable... [the rate of interest] may fluctuate for decades about a level which is chronically too high for full employment...” (Keynes 1936, 203-4)

The liquidity preference theory, based on the presence of uncertainty, thus constitutes a fundamental element in the Keynesian explanation of fluctuations in income and employment based on the instability of investments.<sup>6</sup>

### **1.2 *The limits of the liquidity preference theory.***

There are two important limits to the explanation of the non-neutrality of money based on the liquidity preference theory. The first one can be described by recalling that the definition of the monetary nature of the rate of interest assumes the presence of uncertainty. Uncertainty, and in particular uncertainty about the future rate of interest, is the exogenous element starting from which Keynes, in the *General Theory*, justifies the

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<sup>5</sup> “... it is impossible for the actual amount of hoarding to change as a result of decisions on the part of the public, so long as we mean by ‘hoarding’ the actual holding of cash. For the amount of hoarding must be equal to the quantity of money...and the quantity of money is not determined by the public. All that the propensity of the public towards hoarding can achieve is to determine the rate of interest at which aggregate the aggregate desire to hoard becomes equal to the available cash.” (Keynes 1936, p. 174)

<sup>6</sup> “It is not surprising that the volume of investment ...should fluctuate widely from time to time. For it depends on two sets of judgments about the future, neither of which rests on an adequate or secure foundation -on the propensity to hoard and on the opinions of the future yield of capital assets. Nor is there any reason to suppose that the fluctuations in one of these factors will tend to offset the fluctuations in the other. When a more pessimistic view is taken about future yields, that is no reason why there should be a diminished propensity to hoard. Indeed, the conditions which aggravate the one factor tend, as a rule, to aggravate the other.” (Keynes 1937a, p. 118)

store of wealth function of money and formulates the liquidity preference theory.<sup>7</sup> The importance of money is explained by this exogenous element of uncertainty; it is evident that the thesis of the non neutrality of money would assume more importance if we could explain the importance of the dimension of uncertainty starting with the presence of money.

This is what Keynes tries to do in his 1933 works in which he highlights the need to elaborate a *monetary theory of production* in order to explain the phenomena of the crisis and the fluctuations in income and employment, and he notes that the inability of the classical theory to explain these phenomena is due to the fact that this theory considers money as a neutral variable.<sup>8</sup> In these works Keynes introduces the distinction between a *real-exchange economy* and a *monetary economy*. As is well known, Keynes (1933a, 1933b) uses 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. Keynes (1933a, p. 410) notes that the classical economists formulated an explanation of how the *real-exchange economy* works, convinced that this explanation could be easily applied to a *monetary economy*. He believed that this conviction was unfounded and stressed the need to elaborate a “monetary theory of production, to supplement the real–exchange theories which we already possess” (Keynes, 1933a, p. 411).

Keynes observes that in a *monetary economy* or, as it is otherwise defined, in an *entrepreneurial economy*, the presence of money changes the law of production compared

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<sup>7</sup> Many Keynesians consider uncertainty as a starting point for the justification of the store of wealth function of money. Fontana for instance, states that: “But once uncertainty is recognized as a pervasive feature of individual decision-making, what is left to economic agents? In answering this question, some Post Keynesians have focused their attention on the role of money as a store of wealth. Money is the fundamental macroeconomic institution, a time-machine vehicle, in Davidson expression, for coping with the uncertainty of individual decision-making... A positive demand for a stock of money is thus the way economic agents cope with their uncertain knowledge about the future. Importantly, uncertainty and the related demand for money are grounded in the non-atomistic nature of economic reality. Therefore both uncertainty and the demand for money are permanent features of economic decision-making.” (Fontana 2006, 448-9; see also: Fontana 2009)

<sup>8</sup> “...the conditions required for the ‘neutrality’ of money... are, I suspect, precisely the same as those which will insure that crises *do not occur*.”(Keynes 1933b, 410-11)

to the one that characterises the economic system described by the classical theory, and he illustrates this thesis using 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. 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, 81-2)

Keynes, quoting Marx, underlines that the objective of the entrepreneur is not to produce goods but to make money. This would seem to be an obvious truth: a car producer is not interested in accumulating unsold cars in his store rooms, but in making profits by selling cars for money; selling what was produced is the key point in the entrepreneur’s activity. We must underline that the distinction between the production phase and the sale phase is not relevant in a world in which just one good is produced, such as in Smith’s corn economy, as in this case we assume 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 this case our producer will not be interested, for example, in accumulating cars, but in obtaining a monetary profit from the sale of cars. The presence of numerous goods is a necessary but not a sufficient condition, as, indeed, if our car producer was sure of selling all the cars that he produces at a given price, 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 presence of uncertainty about the 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* in which the formula C-M-C holds from a *monetary economy* in which the law of production M-C-M applies, 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. Instead, 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 [an entrepreneur] share." (Keynes 1933, p. 81). Keynes explains this relation between money that has certain characteristics and uncertainty, observing in the first place that uncertainty about revenue is due to the fluctuations of effective demand:

"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, 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 1933a, 80)

Secondly, Keynes defines the fluctuations of effective demand that give rise to booms and depressions as: "... a monetary phenomenon..." (Keynes 1933b, 85) in as much as these fluctuations depend on the particular characteristics of money used in a *monetary economy*. In chapter 17 of *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 will see in the next pages, Keynes in his works published between 1937 and 1939 identifies with bank money, which makes possible the fluctuations in the aggregate demand and changes the nature of the marginal revenues. We must underline that Keynes defines the law of production that characterises a *monetary economy* by expressing the costs and the marginal proceeds in monetary terms to highlight the fact that the presence of bank money, by making possible fluctuations in aggregate demand, 'produces' uncertainty.

We must thus conclude that in his 1933 works, Keynes defined the causal link between money and uncertainty in the opposite way to that which characterises the liquidity preference theory, according to which, as we recalled, the presence of uncertainty

constitutes the necessary condition to justify the store of wealth function of money. From the 1933 works an explanation of the non-neutrality of money emerges according to which the presence of money constitutes the necessary condition for the dimension of uncertainty, which Keynes underlines is an element that distinguishes a monetary economy from the economy described by the classical theory, to become central.

The second limit of the liquidity preference theory is that this theory overlooks the presence of banks and bank money, and this has two consequences. In the first place, this theory only partially defines the phenomenon of credit; Keynes defines the phenomenon of credit by assuming that the agents who need liquidity turn to the wealth owners, who transfer their liquidity for a premium constituted by the interest rate. The wealth owners are the only agents that can offer credit since it is assumed that the quantity of money is exogenously given and is held by the wealth owners; however, this is a very questionable way to define the credit phenomenon as it is excluded that the liquidity demand from debtors can be met by banks through the creation of new money.

Secondly, we can note that the presence of bank money weakens the explanation of the presence of involuntary unemployment based on the liquidity preference theory. This theory tends to minimise the capacity of the monetary authorities to influence the interest rates which depends essentially on the expectations of wealth owners, as the central bank can influence the interest rates only indirectly through control of the quantity of money. We can underline that in a world where bank money is used, the monetary authorities directly set the interest rate at which they finance the banking system; we can assume that this reinforces their capacity to influence the interest rate level which conditions the firms' investment decisions. This affirmation is coherent with the decisions made in recent years by the monetary authorities of the industrialised countries. They have abandoned the control of monetary aggregates and instead target short-term interest rates. (see, for example: Bank of England (1999); Mishkin (1999), Romer (2000), Woodford (2003), Bindseil (2004), Fullwiler(2006), Nishiyama (2007)). We can maintain that the fact that the monetary authorities can set the short-term interest rate at any level desired, even at a rate close to zero, affects households' liquidity preference and the long-term interest rates and makes it more difficult to assume that unemployment can be attributed to the effects of liquidity preference on long-term interest rates. In other words, we can assume that the expectations regarding future interest rate values are influenced by the value of  $r^*$  set by the monetary authorities, (see, for example: Wray 2006, p. 274; Tily 2007, chap. 7). It is therefore difficult to assume that the presence of unemployment is due to the liquidity

preference that determines a value of the interest rate higher than the one coherent with full employment. We must recognize that the explicit consideration of the bank money creation mechanism reduces the importance of the liquidity preference theory in explaining the fluctuations in aggregate demand and therefore in income and employment. The deep economic crisis resulting from the financial crisis following the collapse in the subprime mortgage market is an important example which confirms this thesis; the very low rates of interest set by the monetary authorities in countries all over the world prevents us from considering the big rise in unemployment in Europe and the United States as a consequence of the liquidity preference that determines excessively high rates of interest.

The aim of this paper is to show that the arguments used by Keynes to respond to the criticism levelled at the liquidity preference theory by supporters of the *loanable funds theory* such as Ohlin and Robertson make it possible to put forward a sounder and more convincing explanation of the reasons of the non-neutrality of money than the one based on the liquidity preference theory. In particular they allow us to explain in a more satisfactory way the two fundamental characteristics of a *monetary economy*: 1) a monetary economy is characterized by the presence of uncertainty; 2) in a monetary economy Say's law does not apply.

## **2. Keynes's response to Ohlin and the nature of credit.**

In some works published between 1937 and 1939 Keynes responded to the criticism levelled at the *General Theory* by supporters of the *loanable funds theory* such as Ohlin and Robertson. Ohlin criticizes the definition of saving that Keynes attributes to the classical economists according to which a saving decision gives rise to an equivalent investment decision as happens in the case of Smith's corn economy. He replies to Keynes that, starting with Wicksell, economists recognize that the saving decisions do not necessarily translate into investment decisions since, as Keynes himself observed, criticizing the classical theory, a saver may decide to accumulate money.<sup>9</sup> Moreover, in

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<sup>9</sup> "I am sure... that most reader of the *General Theory* have been much surprised in finding (on p. 21)... that the classical theorists... "are fallaciously supposing that there is a nexus which unites decisions to abstain from present consumption with decisions to provide for future consumption." Practically all monetary theorists take account of the fact that saving accompanied by 'hoarding' by some people need not lead to investment by other people. Furthermore, it is the very essence of Wicksell's theory of money and

line with Keynes, Ohlin accepts associating the interest rate with a credit contract by means of which it is not the saved resources which are exchanged, but rather the money available today against money available in the future. However, following Wicksell's lesson, he notes that the object of the credit is not just the existing money but also the new money created by the banks. To underline this difference, Ohlin distinguishes the functions of money demand and supply defined by Keynes from the functions of money demand and supply of the loanable funds theory and he stresses that they are *ex ante* concepts.<sup>10</sup>

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.<sup>11</sup> Ohlin acknowledges, as we have seen, 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.<sup>12</sup> Finally, Ohlin asserts that the banking system has an important role in determining the supply of credit independently from saving decisions.<sup>13</sup> Therefore, he concludes that the interest rate is determined within the credit market and is influenced by

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'cumulative processes' that there is no such nexus between plans to save and decisions to invest." (Ohlin 1937b, p.234)

<sup>10</sup> "One must distinguish sharply between the quantity of credit actually given (corresponding to the quantity of a commodity purchased and sold), on the one hand, and the supply and demand *curves* for credit (or commodities) on the other. The former is simply the point of intersection of the curves. When it is said in price theory that the price of a commodity is governed by supply and demand, the meaning is that it is determined by the demand and supply *curves*, which express the planned sales and purchases at different possible prices during a certain future period. These curves are *ex-ante* concepts and indicate alternative purchase and sales plans. In the same way the price of credit is determined by the supply and demand *curves* for credit or, which amounts to the same, for 'claims'. The causal reasoning is *ex-ante*." (Ohlin 1937c, pp.423-4)

<sup>11</sup> "That the relation between the curves referring to savings and investment and those referring to credit is close should be obvious. If a man plans to save, must he not either plan to invest or to lend?" (Ohlin 1937c, p. 425)

<sup>12</sup> "...one can plan to extend new credits in excess of planned savings, if one is willing to reduce one's own quantity of cash." (Ohlin, 1937c, p. 425)

<sup>13</sup> "... the banking system may plan to increase or reduce the volume of credit." (Ohlin, 1937c, p. 425)

all the factors that determine the *ex ante* supply and demand curves for credit.<sup>14</sup> Once the relation between saving decisions and interest rate is confirmed, the concept of the natural rate of interest is recuperated; Robertson (1934) defines the natural rate of interest as: “... the rate at which the new lendings which can be absorbed by industry per atom of time and the new available savings for atom of time are equal.” (Robertson, 1934, p. 651)

Keynes replies to the critiques of Ohlin e Robertson with the objective of defending his thesis about the monetary nature of the rate of interest and the independence of the interest rate with respect to saving decisions. Keynes’s strategy consists, on the one hand, in accepting some elements of Ohlin’s analysis, and on the other, in reiterating the monetary nature of the interest rate. In the face of Ohlin’s criticism, Keynes recognizes the importance of the concept of *ex ante* investment; he recognizes that the planning of an investment decision leads the entrepreneur to obtain liquidity to finance this cost and thus associates the investment decisions with the demand for credit.<sup>15</sup> However, he does not accept Ohlin’s thesis that the credit supply depends on *ex ante* savings,<sup>16</sup> but he recognizes the role of banks in creating new money.<sup>17</sup> Not only does Keynes accept an important point of the LFT, but he uses 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:

“The transition from a lower to a higher scale of activity involves an increased demand for liquid resources which cannot be met without a rise in the rate of interest, unless the banks are

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<sup>14</sup> “The rate of interest is the price of credit, and is governed by the supply and demand *curves* in the same way as commodity prices. These supply and demand curves for credit are closely related to the willingness and ability of people to save and invest... But these curves are also influenced by a desire to vary cash holdings or make financial investments in old assets and by a change in the credit policy of the banking system.” (Ohlin 1937c, p. 427)

<sup>15</sup> “... *ex ante* investment is an important, genuine phenomenon, inasmuch as decisions have to be taken and credit or ‘finance’ provided well in advance of the actual process of investment... In what follow I use the term ‘finance’ to mean the credit required in the interval between planning and execution” (Keynes 1937c, p. 216)

<sup>16</sup> “Surely nothing is more certain than that the credit or ‘finance’ required by *ex ante* investment is not mainly supplied by *ex ante* saving.” (Keynes 1937c, p. 217)

<sup>17</sup> “The *ex ante* saver has no cash, but it is cash which the *ex ante* investor requires. On the contrary, the finance required during the interregnum between the intention to invest and its achievement is mainly supplied by specialists, in particular by banks, which organize and manage a revolving fund of liquid finance.” (Keynes 1937c, p. 219)

ready to lend more cash or the rest of the public to release more cash at the existing rate of interest. If there is no change in the liquidity position, the public can save *ex ante* and *ex post* and *ex anything else* until they are blue in the face, without alleviating the problem in the least.... This means that, in general, the banks hold the key position in the transition from a lower to a higher scale of activity. If they refuse to relax, the growing congestion of the short-term loan market or of the new issue market, as the case may be, will inhibit the improvement, no matter how thrifty the public propose to be out of their future incomes. On the other hand, there will always be *exactly* enough *ex post* saving to take up the *ex post* investment and so release the finance which the latter had been previously employing. The investment market can become congested through shortage of cash. It can never become congested through shortage of saving. This is the most fundamental of my conclusions within this field.” (Keynes, 1937c, p. 222)

In order to highlight the distance between his theory and Ohlin’s, Keynes separates the money market from the credit market and states that his theory of the rate of interest is elaborated considering the money market. Indeed, Keynes considers the ‘finance’, that is firms’ demand for liquidity for the purpose of financing investment decisions, as a further component of money demand.<sup>18</sup> This solution allows Keynes to explicitly consider the problem of financing firms’ investment decisions without changing the structure of the *General Theory*, so he is then able to concede that he made a mistake by overlooking this point.(Keynes 1937c, p.220)<sup>19</sup>

The specification of the *finance motive* has given rise to much commentary;<sup>20</sup> for the purposes of our analysis I believe that the fundamental shortcoming of Keynes’s solution consists in utilizing a unique concept, the demand for money, in order to describe two completely different phenomena. The former involves the demand for liquidity from agents, the firms, who do not have money and who incur debt to carry out a planned investment; the second involves, as maintained by the theory of liquidity preference, wealth owners’ choices regarding the composition of their wealth; this makes the concept of money demand ambiguous. We must further note that when Keynes explicitly recognizes that banks create money to satisfy firms’ demand for liquidity he breaks from

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<sup>18</sup> “If by ‘credit’ we mean ‘finance’, I have no objection at all to admitting the demand for finance as one of the factors influencing the rate of interest. For ‘finance’ constitutes ... an additional demand for liquid cash in exchange for a deferred claim. It is, in the literal sense, a demand for money.” (Keynes 1937c, pp.209-10)

<sup>19</sup> “I should not have previously overlooked this point, since it is the copingstone of the liquidity theory of the rate of interest. I allowed, it is true, for the effect of an increase in *actual* activity on the demand for money. But I did not allow for the effect of an increase in *planned* activity, which is superimposed on the former, and may sometimes be the more important of the two..” (Keynes, 1937c, p. 220)

<sup>20</sup> For a critical analysis of the *finance motive* see for example: Graziani, 1984; Asimakopulos 1985, 1991; Trevithick 1994; Bibow 1995; Chick 1997; Bertocco 2005.

the approach of the *General Theory* according to which the quantity of money is determined by monetary authorities and is independent of demand. It is therefore necessary to verify how these shortcomings can be overcome.

I think that one solution which would make it possible to overcome these shortcomings would be to specify two distinct markets: the money market and the credit market.<sup>21</sup> The specification of the credit market allows us to emphasize that banks create money through a debt contract by which they finance the spending decisions of agents who do not have purchasing power. It is made up of flow variables, the credit demand function reflects the behaviour of firms; this demand for liquidity can be considered as a demand for credit since it is expressed by actors who: (a) do not have liquidity; and (b) who, when they obtain the cash, undertake to pay it back at a fixed future date. By specifying the credit demand function, we distinguish the firms' demand for liquidity to finance investment decisions from the demand for bank money which instead reflects the portfolio decisions of wealth owners. As for the credit supply function, we can assume, following Keynes, that the supply of credit does not depend on saving decisions but depends on the decisions taken by banks and that it is independent of the savings flow.

The money market is made up of stock variables. There is a link between the flow variables that characterise the credit market and the stock variables that make up the money market; this link can be defined by distinguishing between two phases in the money creation process. In the first one banks finance firms by creating new money. Banks and firms are the main actors of this phase. The investments financed by the banks determine an increase in income according to what defined by the Keynesian income theory. In the second phase, wealth owners step in; the new money created by banks is added to the existing money and the saving flow generated by investment decisions increases the public's wealth. The second phase is the one in which the conditions are created for the wealth owners to accept to hold the money created by the banks.<sup>22</sup>

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<sup>21</sup> Many post Keynesians have underscored the utility of differentiating between the money and the credit market; see for example: Wray (1992); Lavoie (1996); Palley (1996); Arestis and Howells (1996, 1999); Dow (1997); Rochon (1999); Bertocco (2001, 2005); Fontana (2004); Docherty (2005); Howells (2006).

<sup>22</sup> This analysis is coherent with what Keynes maintains when he describes the consequences of an increase in investments financed by means of the creation of bank money: "The notion that the creation of credit by the banking system allows investment to take place to which 'no genuine saving' corresponds can only be the result of isolating one of the consequences of the increased bank-credit to the exclusion of the others. If the grant of a bank credit to an entrepreneur additional to the credits already existing allows him to make an

I think that Keynes's insistence, in the face of Ohlin's comments, on denying the relation between saving decisions, credit supply and the interest rate is due to his conviction that the presence of money and in particular of bank money, as the fundamental element to explain two fundamental characteristics of a *monetary economy*: i) a *monetary economy* is characterised by the presence of uncertainty; ii) in a *monetary economy* Say's law does not apply.

### **3. The characteristics of a monetary economy.**

#### **3.1 Money and uncertainty.**

The thesis put forward in this paper is that Keynes's arguments in reply to Ohlin's critique permit us to illustrate the relation between money and uncertainty that he describes in his 1933 works. 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 on investment and wealth accumulation, whose results – not predictable in probabilistic terms - are seen in a more or less distant future, are absent.<sup>23</sup> Naturally it would be excessive to claim that the classical theory

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addition to current investment which would not have occurred otherwise, incomes will necessarily be increased ... Moreover, except in the conditions of full employment, there will be an increase of real income as well as of money-income. The public will exercise 'a free choice' as to the proportion in which they divide their increase of income between saving and spending; and it is impossible that the intention of the entrepreneur who has borrowed in order to increase investment can become effective ... at a faster rate than the public decide to increase their savings. Moreover, the savings which result from this decision are just as genuine as any other savings. No one can be compelled to own the additional money corresponding to the new bank-credit, unless he deliberately prefers to hold more money rather than some other form of wealth. Yet employment, incomes and prices cannot help moving in such a way that in the new situation someone does choose to hold the additional money." (Keynes 1936, pp. 82-3)

<sup>23</sup> "The whole object of the accumulation of wealth is to produce results, or potential results, at a comparatively distant, and sometimes at an *indefinitely* distant, date. Thus the fact that our knowledge of the future is fluctuating, vague and uncertain, renders wealth a peculiarly unsuitable subject for the methods of

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. This conception can be applied to a *corn economy* in which corn is at the same time, according to Smith (1776), a consumer good if it is used to maintain an unproductive worker, that is a worker involved in the production of services in favour of the upper classes, or a capital good if instead it is used as wages to pay the productive worker, i.e. a worker involved in producing corn. Or it can be applied to the fishermen's economy described by Böhm-Bawerk (1884) to illustrate his interest rate theory; in both cases they are economies that produce just one good.

What distinguishes the investments that characterise the *monetary economy* described by Keynes is the fact that they are closely associated with the dimension of uncertainty. Of course even in the case of an economy that produces just one good, we can assume that an entrepreneur is not able to predict in probabilistic terms the future results of his decisions. This situation arises due to extra-economic factors such as unfavourable climatic conditions that ruin the harvest, or social-political events such as the break-out of a war, and so forth. What distinguishes the investments that are made in a *monetary economy* is the fact that the impossibility of predicting their results in probabilistic terms is due to factors of an economic nature, that is the factors which make the distinction between the production phase and the sale phase relevant. This conclusion can be understood if 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, 149-50)

The future yield of a railway, a copper mine or an Atlantic liner are not easily foreseeable because they do not coincide with the productivity of some specific productive

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the classical economic theory. This theory might work very well in a world in which economic goods were necessarily consumed within a short interval of their being produced. But it requires, I suggest, considerable amendment if it is to be applied to a world in which the accumulation of wealth for an indefinitely postponed future is an important factor; and the greater the proportionate part played by such wealth accumulation the more essential does such amendment become.” Keynes (1937a, p. 113).

factor such as land in the case of the Smith's *corn economy*, or the boat in the case of Böhm-Bawerk's *fishermen's economy*. The investments considered by Keynes have the same characteristics as the innovations that are at the centre of Schumpeter's analysis. As is well known, Schumpeter holds that innovations constitute the first endogenous factor that brings about the process of change characterising a capitalist economy. The phenomenon of innovation regards the sphere of production and it may consist of the realization of a new product, the introduction of a new productive method or the opening of new markets.

We can consider the investments of the Keynesian entrepreneur as the tool through which firms launch new products on the market, or modify the productive process through which the existing goods are realized, or even open new markets; so the Keynesian entrepreneur who takes the investment decisions coincides with the Schumpeterian entrepreneur who introduces innovations.<sup>24</sup> This point is emphasized by Davidson (2006, 2007) who describes the differences between mainstream and Keynesian theory by distinguishing between ergodic systems (or immutable-reality models) and non-ergodic systems (or transmutable-reality systems). With the first term Davidson refers to economic systems that replicate themselves unchangingly, or that are subject to alterations predictable in probabilistic terms. With the second term, Davidson refers to systems characterised by a process of continuous transformation triggered by investment decisions; he declares that the presence of the Schumpeterian entrepreneur is a necessary element of a non-ergodic system.

The presence of investments and innovations gives prominence to the uncertainty dimension. In an economy in which just one good is produced, such as a *corn economy* whose investments are made up of unconsumed corn, entrepreneurs are sure of selling everything they produce because the good produced is what ensures the survival of consumers. This does not hold when we consider innovations that give rise to the production of new goods: the entrepreneur who produces the new good is not at all sure that he will be able to sell, making a satisfactory profit, all of the production because the innovation alters the existing world, making it very difficult to predict the reaction of the consumers to the new proposal (Schumpeter 1912, 65).

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<sup>24</sup> Several economists have emphasised the desirability of integrating the Keynesian theory of income determination with Schumpeter's theory of economic development; see for example: Minsky (1986, 1993) Goodwin (1993), Morishima (1992); Vercelli (1997); for a more detailed analysis see: Bertocco (2007).

For this reason, both Keynes and Schumpeter note that investment decisions and innovations are carried out by agents who have particular skills, that is by agents who are able to take decisions in conditions of uncertainty, guided by what Keynes defined as *animal spirits*:

“... a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits – of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities. Enterprise only pretends to itself to be mainly actuated by the statements in its own prospectus, however candid and sincere. Only a little more than an expedition to the South Pole, is it based on an exact calculation of benefits to come. Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die...” (Keynes 1936, 161-2)<sup>25</sup>

We can distinguish at least two types of innovations: the innovations that modify the productive process through which the existing goods are realised and the innovations by means of which new goods are produced. The first type of innovation can be realised even in Smith’s corn economy, by, for example, the introduction of the plough or the tractor. In this case, the investments correspond to the quantity of corn that is used to pay the workers involved in the production of ploughs or tractors, or boats in the case of the fishermen’s economy described by Böhm-Bawerk. These innovations increase the productivity of labour but they do not create uncertainty because, as Keynes notes, the law of production according to which an entrepreneur will hire a new worker if the marginal productivity of labour is higher than the marginal cost, always holds. In this economy costs and revenues are measured in units of the only good produced, the economic activity of the entrepreneur coincides with the production phase as everything that is produced will be consumed or invested, and the profits are defined in terms of corn.

The relation between investment decisions, innovations and uncertainty becomes important if we consider the second type of innovation. In a world in which several goods are produced, the investments that lead to the production of new goods are made in conditions of uncertainty as the entrepreneur is not able to know, for example, how many cars he will be able to sell and at what price. We can associate the two types of innovations

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<sup>25</sup> Some years earlier Schumpeter (1912) noted that the introduction of innovations required very different capabilities from those required to run existing firms and he describes the decisions of the innovating entrepreneur using similar terms to those used by Keynes (see: Bertocco 2007).

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 the few existing goods are produced; it is, as Keynes observes, an economy in which the classical theory that saving decisions determine investment decisions, and money is only a means of exchange, holds. Instead, a *monetary economy* is an economy in which the second definition of innovation applies. It is thus an economy in which many goods are produced and in which investment decisions must be associated with uncertainty as the entrepreneur is not sure that he will be able to sell what he produces.

The second link of the causal sequence between money and uncertainty is constituted by the relation between bank money and investments. To explain this relation we can observe that both the Keynesian entrepreneur and the Schumpeterian innovator-entrepreneur must have the resources available to them to carry out their investments; bank money is the tool that enables them to obtain these resources. The importance of bank money can be explained by recalling that the investments that characterise a *monetary economy* are very different from those that are found, for example, in Smith's *corn economy*. In a *corn economy* to invest means to decide not to consume a part of the corn crop in order to produce more corn, while in a *monetary economy* to invest means, for example, to decide to build a railway; building a railway would be very difficult without bank money.

Indeed, let us suppose that in our *corn economy* an entrepreneur emerges who, 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. Let us further suppose that the existing production techniques make it possible to produce a quantity of corn sufficient to guarantee the survival of the farm workers and those that might be employed in the construction of the railway. We can observe that the railway, at least theoretically, could be built also in a *corn economy*;<sup>26</sup> in this case the construction of the railway is financed by the corn producers who give to our entrepreneur the corn necessary to pay 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 corn equal to the amount lent during construction plus a premium consisting of the interest.

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<sup>26</sup>In Bresciani-Turroni (1936) there is a similar example.

There are at least two elements that impede the realisation of this credit contract. The first is the fact that it is very difficult for corn producers to assess whether the entrepreneur who plans to construct the railway will be able to return the loaned capital because the credit contract necessary to finance the construction of the railway is very different from the one that is usually made in a *corn economy* under which the corn producer gives the excess corn over the amount he intends to consume to another producer who will use it to produce corn. In this case, given the production technique, it is easy for the creditor to calculate the yield of the loaned corn and thus to define the rate of interest to apply to the debtor; in the case of the railway this evaluation is much more difficult because there is no physical law that makes it possible to calculate how much corn will be obtained by the sale of train tickets starting from the amount of corn used to build the railway. The second difficulty concerns the duration of the loan; our entrepreneur will have to find corn producers who are willing to wait ten years before obtaining repayment of the loan.

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 corn producers, 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 the workers who will then be able to buy corn. The corn producers will not have any difficulty in exchanging corn for bank money, which is a perfectly liquid debt claim that can be used as a means of payment at any time. Although they do sell corn to the workers involved in building the railway, the corn producers 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. These agents may be the corn producers if we assume that the latter decide to accumulate the money obtained by selling the corn, or other agents that decided to accumulate the money obtained from payment of goods or services.

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; with their decisions they influence the development of the economic system; it is a very different role from that of mere intermediary that they could perform in a *corn economy* by facilitating the transfer of corn saved to the producers who intend to expand their grain production. Thus, we can maintain that the presence of bank money, and a well-developed credit market, constitutes the necessary condition for the development of an economy in which investment decisions become relevant and in which the presence of uncertainty becomes

an essential factor<sup>27</sup>; we can state that uncertainty is not merely an exogenous dimension, but it becomes a factor whose presence is explained by the spread of bank money.

### **3.2 Money and Say's Law.**

In the previous section we described the relation between bank money and uncertainty by highlighting the points in common between Keynes and Schumpeter. We should add, however, that there is a big difference between the theories of these two renowned economists regarding the explanation of the crisis. Schumpeter analyses the link between bank money, credit and innovations, assuming that the system is always in a position of full employment. In contrast, Keynes states that a monetary economy is characterised by fluctuations in income and employment caused by the fluctuations in the aggregate demand that he considers a “monetary phenomenon”.

Keynes justifies this conclusion in different ways. In the preparatory works for the *General Theory* he highlights that in a world in which money is a good that can be produced through labour, there cannot be unemployment as all the unemployed workers could set about producing money; Keynes considered the case of gold money:

“In actual fact under a gold standard gold can be produced and in a slump there will be some diversion of employment towards gold mining. If, indeed, it were easily practicable to divert output towards gold on a sufficient scale for the value of the increased current output of gold to make good the deficiency in expenditure in other forms of current output, unemployment could not occur...” (Keynes 1933b, p. 86)

This explanation does not seem very convincing; indeed, it is not clear why unemployed would start producing gold only in the case in which a gold money is used while they would choose to stay unemployed if gold was no longer used as money and was a good like any other one. Moreover Keynes's conclusion can only be applied to an economy of self producers that is to an economy in which a few goods are produced using basic production techniques that are well known and that can be used even by a single producer. In this economy there is no unemployment since if demand for a good falls the producers

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<sup>27</sup> These considerations can be used to explain the meaning of the following statement by Davidson: “In an entrepreneurial system of organizing production, economic growth requires a banking system that will provide an ‘elastic currency’ so that the expanding needs of trade can be readily financed. This is the essence of the ‘real bill doctrine’ In the absence of a financial system which can provide such an endogenous money system, an entrepreneurial, market oriented, monetary-production economy will find that its best made plans for expansion will be stymied.” (Davidson 2006, 148)

of that good set about producing another good, not necessarily the good that is used as money; everyone knows how to produce the few consumer goods used in an economy based on consumer decisions. Things change radically in a *monetary economy* that is characterised by the presence of entrepreneur-innovators who employ the workers in productive processes whose results cannot be replicated by single producers. In this case the workers who remain unemployed due to the decrease in aggregate demand do not start producing gold not because gold is no longer used as money, but because the production of gold, as with any other good, requires the use of a technology that cannot be used by a single producer.

In the *General Theory* Keynes provides a different explanation for the reasons why the use of a fiat money triggers fluctuations in the aggregate demand; he states that:

“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. There is no remedy but to persuade the public that green cheese is practically the same thing and to have a green cheese factory (i.e. a central bank) under public control.” (Keynes 1936, p. 235)

Many Keynesians have pointed out on the basis of Keynes’s words, that in a fiat money world an increase in the demand for money causes a drop in effective demand and thus a rise in unemployment.<sup>28</sup> This explanation stresses that if a part of the monetary income received by agents is accumulated rather than spent, effective demand will be unable to absorb all of the aggregate output. This explanation seems very convincing but in

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<sup>28</sup> Davidson (1994, p. 95), for example, writes: ‘suppose because the future suddenly appears more uncertain, people decide to buy fewer space vehicles (automobiles) to transport themselves geographically and instead demand more time vehicles to convey their purchasing power to an unspecified future time to meet possible liquidity needs. The decreased demand for space vehicles causes unemployment in the economy’s auto factories. The increased demand for liquidity does not induce an offsetting increase in employment in the production of money or any good producible in the private sector. Of course, if peanuts were money ... then unemployment in the auto industry would be offset by increased employment in the peanut farms.... Uncertainty and unwillingness to commit earned income to current purchases of producibles (a process that the layperson terms savings) will cause unemployment, if, *and only if*, the object of the savers’ desire is a resting place for their savings that is non producible and not readily substitutable for producibles—even if prices are flexible.’ Likewise, Kregel (1980, p. 43) states that: ‘in a monetary production economy ... when incomes are paid in terms of money, income will represent demand for either current output or stores of value. The use of income to demand “money” as a store of value, however, is not an *effective demand* (for labor), because it does not lead to the expectation of future sales of producibles goods, and this does not create the *expectation* of income.’

actual fact it cannot be applied to a *monetary economy*. The explicit consideration of the process of bank money creation allows us to affirm that investment and saving decisions are carried out in two logically different times: investments are financed by means of the creation of bank money and they are realized independently of the savings decisions, and investment decisions give rise to an increase in income which in turn gives rise to an equivalent saving flow. The consequence of this is that the way in which savers choose to invest their saving, accumulate money or other assets, does not influence the level of aggregate demand and income; in other words, we can state that the level of income depends on the propensity to save but not on the way in which saving is invested. It is of course true that in a world in which wages are paid in money, workers' decisions to use part of their incomes to increase the money stock does not generate effective demand. This statement does not, however, constitute a satisfactory explanation of why the presence of a fiat money eliminates the conditions on which Say's Law rests. This explanation overlooks the fact that the new money accumulated by those who decide not to spend all their income must have been created by some agent. It is therefore necessary to specify the mechanisms through which the new money accumulated by savers is created. If we should find that the creation of new money results in an increase in aggregate demand capable of offsetting the lower demand for goods induced by agents' saving decisions, then this explanation should be questioned. In fact, if we consider the process of bank money creation described in the previous pages, we must conclude that the money accumulated by savers was created by the banks to finance firms' investment decisions.

The explanation of the monetary nature of the fluctuations of the aggregate demand, based on the liquidity preference theory, appears to be flawed too, as we have seen in the previous pages. The considerations about the relation between money and uncertainty set out in the previous section make it possible to elaborate an explanation of the monetary nature of the fluctuations in income and employment which is sounder than the one based on the liquidity preference theory. In the *General Theory* Keynes underlines 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 to rise.<sup>29</sup>

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<sup>29</sup> "When employment increases, aggregate real income is increased. The psychology of the community is such that when aggregate real income is increased aggregate consumption is increased, but not so much as

The principle of effective demand does not hold in a world, such as Smith's *corn economy*, in which a unique good is produced; in this case, the income level is determined by production decisions and whatever is not consumed is automatically invested. A higher saving rate implies more investments and therefore higher future production that will lead to greater consumption and investments. The investments can give rise to innovations which make it possible to increase the productivity of labour; an example of innovation could be the introduction of the plough. Let us assume that by using the plough the productivity of labour doubles. This will not create any problems of effective demand as it is implicitly assumed that the demand for corn from the public at large can increase infinitely; in this case the population's consumption of corn will double.

Keynes describes a different economy, in which consumption does not increase infinitely following the increase in the productive capacity; we can hypothesise that there is a limit to the capacity for corn consumption, for example two quintals annually per worker, and that each one of the thousand workers available produces, using a plough, exactly two quintals of corn. Let us further suppose that a new innovation, for example the tractor, permits the doubling of the productivity of labour, bringing it to four quintals per worker. In this case consumption will not rise above the limit of the two quintals, and thus the entrepreneurs will continue to employ a thousand workers to produce corn only if they are willing to accumulate profits in terms of corn equal to two quintals per worker, or if, by some magic spell, they were willing to pay the thousand workers the same salary but halving the work time, thereby fulfilling Keynes's predictions about the economic possibilities for 'his' grandchildren (Keynes 1931).

Excluding these solutions, we must conclude that if the psychological law on which the principle of effective demand is based applies, and this would seem to be a reasonable hypothesis if we consider a world in which innovations have significantly increased the productivity of labour employed in the production of consumer goods, full employment can be maintained only if we achieve a significant flow of investments that have the

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income. ... Thus, to justify any given amount of employment there must be an amount of current investment sufficient to absorb the excess of total output over what the community chooses to consume when employment is at the given level. It follows, therefore, that, given what we shall call the community's propensity to consume, the equilibrium level of employment, i.e. the level at which there is no inducement to employers as a whole either to expand or to contract employment, will depend on the amount of current investment. ... Thus, given the propensity to consume and the rate of new investment there will be only one level of employment consistent with equilibrium..." (Keynes, 1936, pp. 27-8)

characteristics described by Keynes and Schumpeter. Indeed, these investments cannot consist in the use of corn for the production of new corn, but in the use of corn for the production of new goods, for example the railway. The investments will be the corn necessary to pay the five hundred workers employed in the construction of the railway. This investment, as we have seen, is facilitated by the presence of a bank money; the corn producers are unlikely to directly finance the construction of the railway by selling corn to the entrepreneur - innovator, but they will be willing to sell corn for the money created by banks and therefore they will be willing to accumulate a monetary profit deriving from the sale of corn as the money is not perishable and it can be used in any future moment to purchase any good.

The inversion of the relation between investment and savings with respect to the tenets of the neoclassical theory, that characterises the principle of effective demand, makes it necessary to explain how the firms acquire the purchasing power necessary to finance the desired investments. The explicit consideration of the presence of bank money makes it possible to elaborate this explanation. The investments are financed by means of the creation of bank money and they are realised independently of the saving decisions. Different economists, in particular Chick (1986, 1992), have underlined the relation between the presence of bank money and the causal nexus between investments and savings. We must note that, unlike what Chick suggests, the presence of bank money is a necessary element but not a sufficient one to justify the inversion of the causal relation between investments and savings with respect to the tenets of the classical theory and to state that in a *monetary economy* Say's law does not apply. As a matter of fact, as we have seen, also Wicksell and the supporters of the LFT recognise that the banks are not mere intermediaries but that they finance investment decisions by creating new money. However, they hold that the diffusion of bank money does not change the structure of the economic system, which remains that which characterises a world without bank money in which the credit market coincides with the capital market, that is a world in which the saved resources are bartered and the interest rate is just the natural rate of interest. According to Wicksell and the supporters of the LFT the monetary rate of interest controlled by the monetary authorities and by the banking system converges towards the natural rate, hence also an economy that uses a bank money converges towards the full employment equilibrium.

Indeed, if we acknowledge that the monetary authorities can directly control the rate of interest, and if we allow the existence of a positive value of the interest rate at which firms

carry out a level of investment compatible with full employment, then we must conclude that there are no obstacles to the realisation of full employment. Indeed, let us assume that the monetary authorities do not know the value of the rate of interest coherent with full employment and so, for example, they set the rate of interest at a higher value than the optimal one. This will cause a level of involuntary unemployment which will lead the monetary authorities to reduce the rate of interest until full employment is reached. In the case of a monetary rate of interest which is lower than the optimal rate, there will be an excess of aggregate demand which triggers inflation.<sup>30</sup>

In order to justify the inversion of the relation between investment and savings it is necessary to show that a monetary economy is characterized by fluctuations in income and employment caused by fluctuations in investment decisions. The relationship between bank money and uncertainty we described in the previous pages allow us to explain this point. We have seen that the amount of investments depends, at first, on the *animal spirits*;<sup>31</sup> given the *animal spirits*, we can distinguish two situations. Firstly, we can assume that there is no rate of interest higher than zero at which entrepreneur-innovators are willing to realise a flow of investment coherent with full employment; in this case there will be involuntary unemployment even at a rate of interest equal to zero. Secondly, we can suppose that there exists a value of the interest rate so low to cause a flow of demand for investment goods coherent with the full employment income. Wicksell and the supporters of the loanable fund theory such as Ohlin and Robertson, states that when banks fix the rate of interest of money at a value that equals the natural rate of interest, the presence of bank money does not alter the economic equilibrium (Wicksell 1898, p. 84). 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.

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<sup>30</sup> The concept of natural rate of interest can be compared to the concept of optimal rate of interest, which indicates the rate of interest coherent with full employment: "In equilibrium the production of capital goods is determined by equality between the marginal efficiency of capital and the normal rate of interest but this need not imply full employment unless the normal rate of interest happens to coincide with the optimum rate; the optimum rate being the rate consistent with full employment." (Rogers 1997, 21).

<sup>31</sup> "... if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die... individual initiative will only be adequate when reasonable calculation is supplemented and supported by animal spirits, so that the thought of ultimate loss which often overtakes pioneers... is put aside as a healthy man put aside the expectation of death." (Keynes 1936, p.162)

This conclusion is based on the assumption that once the rate of interest is set at a level at which entrepreneurs wish to realise a flow of investments coherent with full employment, the banks also decide to create a flow of new money capable of financing the amount of investments desired by the entrepreneur-innovators; in this case Say's law is satisfied and banks can be considered as intermediaries which lend what is lent to them.

This assumption does not necessarily apply in a *monetary economy*; indeed, we must stress that the presence of uncertainty connected with the use of a bank money also influences the banks' decisions. They also take decisions in conditions of uncertainty; not even the banks can predict in probabilistic terms the future results related to the construction of the railway. They could thus decide not to finance the railway, that is, they may decide to ration credit because, for example, they may view the prospects of 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 works.

If we consider our example 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 corn producers whose future profits depends 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; indeed, we can observe that to run the railway once it is built will probably not require the same number of workers used to construct it, therefore it will be necessary to realise other innovations in order to maintain full employment.

Finally, there is another element that characterises a *monetary economy*: its fragility. This point was underlined by Minsky (1975, 1980, 1982) who highlighted the fact 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. This depends on the success of the innovation; in our example it depends on the willingness of the public at large to modify its consumption by accepting to consume not only corn but also train rides. The entrepreneur-innovator will manage to repay his loan if he obtains monetary profits the total amount of which will depend not only on the willingness of the public to use the train but also on the level of consumption, which will in turn depend on the income and therefore on the investments of the entrepreneur-innovators. If the profits are too low, the entrepreneurs will become insolvent and this could lead to a crisis characterised by low incomes and high unemployment.

## Conclusions

Keynes opens the *General Theory* by stating that his objective is to elaborate an alternative theory to the classical one as the latter can be applied only to a special case whose characteristics: "... happen not to be those of the economic society in which we actually live..." (Keynes 1936, 3). This point has been highlighted by many Keynesian economists; Pasinetti, for instance, states that the principle of effective demand holds in an industrial economy and not in an agricultural or artisan economy.<sup>32</sup>

The basic question to be addressed is the specification of the characteristics that distinguish an industrial economy from an agricultural economy or, to use Keynes's terminology, a monetary economy from a real exchange economy. In *General Theory* Keynes uses the liquidity preference theory to explain the monetary nature of the interest rate. In this paper the limits of this theory have been highlighted, and it has been pointed out that it would be worthwhile to elaborate a new explanation of the reasons for the non neutrality of money based on the relation between money and uncertainty that emerges from Keynes's 1933 works and on the arguments that he presents in his works published between 1937 and 1939 in which he explicitly considers the effects of the presence of a bank money.

In the last part of this paper it has been shown that the characteristics that distinguish a *monetary economy* from a *real exchange economy* can be considered as a consequence of the presence of a bank money. In particular, the presence of bank money can be considered as a necessary condition to explain the nature of investment decisions that characterise an industrial economy compared to an agricultural economy and therefore the importance of uncertainty. Finally, it has been shown that the relation between money and uncertainty

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<sup>32</sup> "It is important to realize how inherent and deep a characteristic of industrial economies the principle of effective demand is. In economies of the earlier, agricultural and artisan type, every farmer and artisan used to produce as much as possible (irrespective of demand). Then they carried whatever was produced to the market, where it fetched the price that the market made. Industrial societies have changed considerably. Any producer must try to estimate the demand that is likely to be effective before starting any production and all and quite irrespective of existing productive capacity. Disregarding this simply causes a 'market glut'. In this sense, at any point of time it is expected demand (Keynes's effective demand) that generates production." (Pasinetti 2007, 100-1)

that characterises a monetary economy makes it possible to elaborate an explanation of the monetary nature of the fluctuations of the aggregate demand which is sounder than that based on the liquidity preference theory.

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