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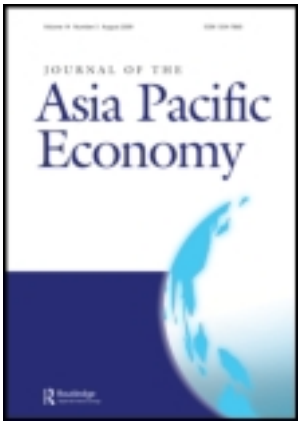

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Are banks special? Some notes on Tobin's theory of financial intermediaries

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Since the 1960s, Tobin has set himself the objective of developing a macroeconomic model more general than that specified by Keynes in the *General Theory*. In his works, he explicitly deals with financial intermediaries and elaborates a 'new view' which, in contrast with the 'old view', maintains that there are no reasons to attribute a special role to the banks. This paper critically analyses Tobin's theory and shows that this theory overlooks an important function of banks highlighted by Keynes, and that the specification of this banks' function is the necessary condition to highlight the most significant aspects of what Keynes calls a *monetary economy*. These points enable us to draw some observations about the question of the financial system regulation.

Keywords: financial intermediaries; banks; monetary economy

JEL classifications: E12, E40, E44, G21

1. Introduction

Since the 1960s, Tobin has set himself the objective of developing a macroeconomic model more general than that specified by Keynes in the *General Theory*. Keynes had assumed that all the assets different from money were perfect substitutes; this hypothesis allowed him to explain only one interest rate. On the contrary, Tobin abandons the perfect substitutability hypothesis and elaborates a theoretical model that envisages more than two assets and explicitly deals with financial intermediaries. Moreover, Tobin asks himself whether banks play a special role compared with the other intermediaries and elaborates a 'new view' which, in contrast with the 'old view', maintains that there are no reasons to attribute a special role to the banks. This paper critically analyses Tobin's theory and presents two results. First, it shows that Tobin's theory underestimates an important function of banks. Tobin analyses the role of banks by using the capital account of an economic system that specifies the assets and liabilities of the sectors of the economy; according to this approach, the banks' role consists in matching the portfolio preferences of debtors and creditors. Following this approach, Tobin underestimates one aspect of banks' activities, which is to create money to finance investment decisions, a function highlighted by Keynes in some writings that preceded and followed the publication of the *General Theory.* Second, the paper underlines that the explicit consideration of the presence of banks and bank money and the specification of the process of investment decisions financing allows us to highlight the most important aspects of what Keynes calls a *monetary economy*. This paper

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is organised as follows. In Section 2, the most important aspects of Tobin's 'new view' are described. The limitations of this theoretical approach are then shown in Section 3, and in Section 4, the consequences of the specification of the role of banks in financing investment decisions are outlined. This analysis enables us to draw some observations about the role of the banking system in the global financial crisis and about the question of the financial system regulation.

2. Tobin's 'new view'

Tobin presents his theory of financial intermediaries by starting from a criticism of the 'old view', according to which banks play a special role compared with the other intermediaries. Under the 'old view', the specificity of banks derives from the fact that their liabilities, unlike those of other intermediaries, are used as a means of payment, i.e. they are money. And so this allows banks to offer credit by creating new money while the other intermediaries can only lend what they manage to collect from savers. Tobin observes that according to the 'old view':

> a long line of financial heretics have been right in speaking of 'fountain pen money' – money created by the stroke of the bank president's pen when he approves a loan and credits the proceeds to the borrower's checking account. ... On the other hand, financial intermediaries other than banks do not create money, and the scale of their assets is limited by their liabilities, i.e. by the savings the public entrusts to them. They cannot count on receiving 'deposits' to match every extension of their lending. (Tobin 1963, pp. 408–409)

The 'old view' held that banks are special because depositors entrust to banks whatever amount banks are willing to lend, whereas other intermediaries lend up to what they are able to collect. For this reason, Tobin (1963) notes that the supporters of the 'old view' deem it necessary to impose a reserve requirement on banks in order to limit banks' loans.

Tobin sets out, in contrast to the 'old view', a 'new view', according to which the fact that the banks' liabilities are used as a means of payment does not invest them with a special role compared with other financial intermediaries; in particular, it does not give banks the power to expand credit in an unlimited way. Tobin's 'new view' asserts that banks' dimensions are subject to the same constraints that condition the dimensions of the other intermediaries. Tobin criticises the 'old view' because it neglects the store of wealth function of money. Tobin's analysis has his theoretical roots in Hicks's famous article (Hicks 1935) and in the *General Theory*. This analysis is based on the concept of demand for money and maintains that the most important question that monetary theory has to deal with is to explain: 'why paper that makes no intrinsic contribution to utility or technology is held at all and has positive value in exchange for goods and services' (Tobin 1982, p. 173). Tobin observes that the 'old view' is based on the assumption that wealth holders are willing to accumulate all the liabilities that banks decide to create; in other words, according to the 'old view': 'the preferences of the public normally play no role in determining the total volume of deposits or the total quantity of money' (Tobin 1963, p. 408). On the contrary, Tobin, focusing on the store of wealth function of money, emphasises that the portfolio preferences of wealth owners influence the quantity of bank money. He justifies this conclusion by distinguishing between money created by governments and bank money and he notes that only the quantity of money created by the government is independent of wealth owners' portfolio preferences since wealth owners cannot destroy legal tender; instead, bank money is created and destroyed through economic transactions:

> Evidently the fountain pens of commercial bankers are essentially different from the printing presses of governments. Confusion results from concluding that because bank deposits are like currency in one respect – both serve as media of exchange – they are like currency in every respect. Unlike governments, bankers cannot create means of payment to finance their own purchases of goods and services. Bank-created 'money' is a liability, which must be matched on the other side of the balance sheet. ... Once created, printing press money cannot be extinguished. ... The community cannot get rid of its currency supply; the economy must adjust until it is willingly absorbed. ... For bank-created money, however, there is an economic mechanism of extinction as well as creation, contraction as well as expansion. If bank deposits are excessive relative to public preferences, they will tend to decline; otherwise bank lose income. The burden of adaptation is not placed entirely on the rest of the economy. (Tobin 1963, p. 415)

Tobin underlines that the economic decision that determines the quantity of bank money is the portfolio decisions of wealth owners; presenting the 'new view' he assumes that there are two groups of agent: wealth owners, who decide the composition of their portfolio by choosing amongst the assets present in the market, and correspondingly, the debtors who issue financial instruments. The choices of these two groups of agents are described by specifying a capital account that is distinct from the income account.[1] The analysis of the capital account is developed by considering as exogenous data the values of the income account. The presence of these two groups of agents is a necessary condition to justify the existence of financial intermediaries. Financial intermediaries can match the portfolio preferences of these two types of subjects thanks to their ability to assume liability of smaller risk and greater liquidity than their assets.[2] Tobin maintains that there are no reasons to attribute a special role to banks; banks, like other intermediaries, issue liabilities that have to satisfy the preferences of wealth owners, and they store up assets that satisfy the portfolio preferences of borrowers. The fact that banks' liabilities are used as means of payment is not a sufficient reason to attribute a special role to the banks:

> The special attention given to commercial banks in economic analysis is usually justified by the observation that, alone among intermediaries, banks 'create' means of payment. This rationale is on its face far from convincing. The means-of-payment characteristic of demand deposits is indeed a feature differentiating bank liabilities from those of other intermediaries. Insurance against death is equally a feature differentiating life insurance policies from the obligations of other intermediaries, including banks. It is not obvious that one kind of differentiation should be singled out for special analytical treatment. (Tobin 1963, p. 412)

Tobin maintains that banks may expand credit only if they succeed in inducing wealth owners to increase their share of deposits and thus he concludes that the banks' dimensions depend on the same constraint that influences the other intermediaries:

> Neither individually nor collectively do commercial banks possess a widow's cruse. Quite apart from legal reserve requirements, commercial banks are limited in scale by the same kinds of economic processes that determine the aggregate size of other intermediaries. (Tobin 1963, pp. 412–414)

We can illustrate Tobin's thesis starting from the simplest model of capital account that he analysed (Tobin and Brainard 1963). It is a model that considers only two assets, money and capital goods, and that aggregates the operators in two sectors: the public sector that issues money to finance its own deficit and the private sector that accumulates money and capital goods. The equations that describe the conditions of equilibrium in the two markets of assets determine the interest rate structure; in particular, given the rate of return on money,

the model determines the yield on capital goods. The presence of financial intermediaries in this model depends in the first place on the existence of economic agents willing to get into debt to purchase an amount of existing capital goods greater than that of their wealth. The intermediaries finance these agents by giving them money; the difference between the banks and the other intermediaries is the fact that banks can create new money while the other intermediaries obtain money by issuing financial instruments that must be absorbed by the wealth holders in exchange for money. Tobin maintains that this difference is of no importance as in both cases the agents that get into debt use the money received from banks or from other intermediaries to purchase existing capital goods, and this will only be possible if wealth owners are willing to sell capital goods in exchange for the liabilities issued by the intermediaries. If we assume that the two operations, the granting of credit and the purchase of existing capital goods, occur at the same time, we can conclude that the presence and the dimensions of intermediaries depend on the willingness of wealth owners to alter the composition of their wealth by selling capital goods in exchange for the liabilities issued by the intermediaries: bank deposits (bank money) in the case of the banks, or other assets issued by the non-bank intermediaries. Like the other intermediaries, the banks will manage to grow in size only if the wealth owners are willing to sell capital goods in exchange for their liabilities.[3]

3. A critical analysis of Tobin's 'new view'

Tobin's analysis is coherent with the approach elaborated by Keynes in the *General Theory,* a theoretical scheme founded on the concept of money demand and on the liquidity preference theory. Starting from the most simple economic system, described by the money–capital goods model recalled in the previous paragraphs, Tobin divides the public (the private sector): 'into two parts: wealth-owners and borrowers. Wealth-owners command the total private wealth of the economy and dispose it among the available assets, ranging from currency, to direct ownership of capital. Borrowers use the loans they obtain ... to direct ownership of capital' (Tobin and Brainard 1963, p. 388). The presence of these two groups of agents constitutes the necessary condition for the presence of financial intermediaries whose function, as has been recalled above, consists in reconciling the portfolio preferences of debtors and wealth owners. According to Tobin, the presence of banks and financial intermediaries produces some significant effects, for example it reduces the interest rate at which debtors can get finance,[4] but the presence of bank money and financial intermediaries does not alter the structure of the economic system whose essential aspects can be described by means of the money–capital goods model. The explicit consideration of the presence of banks does not alter the nature of the rate of interest; the rate of interest that influences investment decisions always depends on the liquidity-preference schedule and on the quantity of money determined by the monetary authorities. In other words, if we consider Keynes's definition of a *monetary economy,*[5] we must conclude that according to Tobin, the key characteristics of a *monetary economy* can be described by overlooking the presence of bank and bank money.

The thesis put forward in this paper is that the presence of bank money and of banks is the necessary condition to explain the characteristics of a *monetary economy*. This thesis is presented by referring to the arguments Keynes (1937b, 1937c) used responding to critiques of the interest rate theory set out in the *General Theory*; these arguments are recalled in this section, while the role of bank money in a *monetary economy* is described in the following section.

Keynes explicitly considers the presence of banks and bank money when he responds to the criticism of the liquidity preference theory by supporters of the *loanable funds theory*, such as Ohlin (1937a, 1937b) and Robertson (1936), who state that the rate of interest is determined by the demand and supply of loanable funds. Keynes acknowledges that in the *General Theory* he overlooked the fact that the planning of an investment decision *(ex ante investment)* leads firms to demand liquidity to finance this cost, and he fills this gap by specifying a further motive for demanding money: the 'finance motive'.[6] He does not, however, accept Ohlin's thesis that the liquidity supply depends on saving decisions planned by operators (*ex ante saving),* but he emphasises the role of banks in creating new money.[7] While in the *General Theory* Keynes had overlooked the presence of bank money, when responding to Ohlin's criticism he uses the presence of banks to assert that the credit demand of firms is met through the creation of money by the banks and not by means of 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 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. (Keynes, 1937c, p. 222)

Keynes can thus be associated with what Tobin (1963, p. 408) calls: 'a long line of financial heretics' who uphold the 'old view' in contrast with the traditional theory that considers banks as mere intermediaries who lend what they collect. Tobin acknowledges that banks can create money, and states that what conditions the volume of bank credit is not the amount of pre-existent deposits but, as we saw previously, the willingness of wealth owners to accumulate the money created by banks. Keynes reply to Ohlin allows us to maintain that Tobin's conclusion is valid only in the particular case in which agents get into debt to finance the purchase of existing capital goods. In fact, we can distinguish two components of the credit demand: (a) the demand from those who wish to buy existing capital goods and (b) the demand from those who intend to buy newly produced goods, in particular the demand for purchasing power on the part of entrepreneurs that intend to realise new investments. Tobin states that in both cases, banks' dimensions are subject to the same tie: the wealth owners' willingness to store up the new money. I believe that this view is not correct; in order to justify this conclusion it is useful to recall Tobin's argument:

> The banking system can expand its assets either (a) by purchasing, or lending against, existing assets; or (b) by lending to finance new private investment in inventories or capital goods, or buying government securities financing new public deficits. In case (a) no increase in private wealth occurs in conjunction with the banks' expansion. There is no new private saving and investment. In case (b), new private saving occurs, matching dollar for the private investments or government deficits financed by the banking system. In neither case will there automatically be an increase in savers' demand for bank deposits equal to the expansion in bank assets.
>
> In the second case, it is true, there is an increase in private wealth. But even if we assume a closed economy in order to abstract from leakages of capital abroad, the community will not ordinarily wish to put 100 per cent of its new saving into bank deposits. Bank deposits are, after all, only about 15 per cent of total private wealth in the United States; other things equal, savers cannot be expected greatly to exceed this proportion in allocating new saving. So, if *all* new saving is to take the form of bank deposits, other things cannot stay equal. Specifically, the yields and other advantages of the competing assets into which new saving would otherwise flow will have to fall enough so that savers prefer bank deposits. (Tobin 1963, p. 413)

According to Tobin, there are no differences between cases (a) and (b); in both cases, the banks are able to expand their liabilities only if the wealth owners are willing to modify the composition of their wealth. In actual fact, there is an important difference between the two situations. In case (a), when the banks finance the purchase of existing capital goods the fact of whether or not their liabilities are used as a means of payment is not important. Indeed, if we assume, as in the previous section, that the moment in which banks create money coincides with the moment in which wealth owners accept to modify the composition of their wealth, as happens in the case of the open market operations described in all macroeconomics textbooks, we must conclude that banks can expand their dimensions only if the wealth owners accept to modify the composition of their wealth by selling capital goods and accumulating the liabilities issued by the banks.

Case (b) is very different: the moment in which banks create money to finance investment decisions does not coincide with the moment in which wealth owners must change the composition of their wealth in order to store up the new money. In this case, banks' decisions to create new money will be influenced by the firms' credit demand and not by the wealth owners' choices; it is only after the creation of money that the conditions necessary to induce wealth owners to accumulate new money will have to be created. From the logical point of view, these two instants are separated by the variation in the flows of investment, income and saving, generated by the decisions of banks, firms and households. In this case, we can divide the money creation process into two phases: in the first, banks create money to finance the firms' investment decisions. In this phase, banks and firms are the principal actors and their decisions are not conditioned by the decisions of wealth owners. The investments financed by the banks determine an increase in income according to what defined by the Keynesian income theory. Once the income creation process described by the Keynesian theory is completed, the second phase, in which the decisions of wealth holders become important, is entered into; 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.

The fact that the necessary conditions must be created to encourage wealth owners to absorb the new money created by banks to finance firms' investment decisions does not imply that wealth owners by their choices can influence the quantity of money since the wealth owners come on the scene after money is created. Only in case (a) can we assume, as Tobin does, that the capacity of the banks to create money depends on the willingness of wealth owners to alter the composition of their wealth, and we can consider banks as intermediaries who set themselves the objective of satisfying the portfolio preferences of debtors and wealth owners.

To describe the process of money creation carried out by the banks to finance firms' investment decisions, it is also necessary to specify the income account and to distinguish the two stages of the money creation process: the moment in which banks create money to finance firms and the moment in which the new money is accumulated by wealth owners. These points can be analysed by using a simple model that specifies two distinct markets: the money market (or deposit market) and the credit market. The credit market 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 (1) do not have liquidity and (2) 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.[8] As for the credit

supply function, following an important tradition based on the works of economists such as Wicksell, Keynes and Schumpeter, we assume that the supply of credit does not depend on saving decisions but depends on the decisions taken by banks (for a more detailed analysis, see Bertocco 2005, 2007, 2010). The money market is made up of stock variables. The model describes a system composed of five markets: money, which corresponds to bank deposits; monetary base; bank credit; government bonds and commodities. We can represent the credit market using the following equations:

$$r_l = (1 + q)r^*, \tag{1}$$

$$I = I(\pi^e; r_l), \tag{2}$$

$$\Delta L = I, \tag{3}$$

$$\Delta D + \Delta\text{FINB} = \Delta L + \Delta R, \tag{4}$$

$$\Delta R = q_k \Delta D, \tag{5}$$

$$\Delta\text{FINB} = \Delta R, \tag{6}$$

$$\Delta\text{BM} = \Delta\text{FINB}. \tag{7}$$

Equation (1) introduces the typical assumption of the horizontalist version of the endogenous money theory, according to which banks set the interest rate on loans r_l by applying a markup on the official discount rate exogenously set by the monetary authority r^*. Firms define the desired investments (I) according to their expectations of profits π^e and the loan rate (Equation (2)). Equation (3) defines the demand for credit from firms; for simplicity, let us assume that the self-financing of firms is equal to zero and that bank credit is the only source of financing for firms. Let us further assume that banks meet firms' demand for credit to finance the desired investments; this equation describes Keynes's finance motive as credit demand.[9] Equation (4) specifies the balance sheet condition of the banks; the sum of the deposit flow ΔD and the financing that banks receive from the central bank ΔFINB, corresponds to the sum of the credit flow ΔL and the flow of required reserves ΔR. Equations (5)–(7) describe the monetary base market. It is assumed that only banks demand monetary base to constitute the required reserves; Equation (5) specifies that the amount of the required reserves depends on the flow of deposits ΔD. Equation (6) determines the banks' demand for monetary base from the central bank ΔFINB; this demand corresponds to the amount of the required reserves ΔR. Finally, Equation (7) determines the monetary base flow ΔBM created by the monetary authorities to meet the demand from banks; it is assumed that the central bank sets the official discount rate r^* and meets the bank's demand for monetary base. This first set of seven equations determines r_l, I, ΔL, ΔD, ΔR, ΔBM and ΔFINB.

Given the investment flow I, it is possible to determine the income level. Equation (8) determines the level of income Y as a function of investment, public spending G and the propensity to save s:

$$Y = Y(I, G, s). \tag{8}$$

The equations described so far determine the flow of new money created by banks as a function of the loans granted, but they do not specify under which conditions the wealth owners are willing to accumulate the money created by the banks.[10] These conditions can

be defined by considering the money market:

$$D = D_{t-1} + \Delta D, \tag{9}$$

$$D = f(W;r_D;r_b), \tag{10}$$

$$W = W_{t-1} + S(Y). \tag{11}$$

Equation (9) determines the stock of money (D); let us recall that in this model, money corresponds to bank deposits (D). The stock of money corresponds to the stock existing at the beginning of the period $D_{t\text{-}1}$ to which is added the flow of deposits created in the current period. Equation (10) describes the money demand function that depends on the stock of wealth W, the rate on deposits r_D which is assumed given, and the rate on bonds $r_{b.}$ Finally, Equation (11) determines the value of the stock of wealth as a sum of the stock existing at the beginning of the period $W_{t\text{-}1}$ and the saving flow $S(Y)$ that is registered in the course of the period. Equations (9)–(11) determine the unknowns r_b, D and W.

This model is very rough as it overlooks some important issues: (1) it envisages the firms' continuous indebtedness to which corresponds households' accumulation of wealth and it does not consider the loan repayment phase and the consequences of the failure to repay loans, issues that are central to the analysis of Minsky (1975, 1980, 1986); (2) it overlooks the fact that firms can finance themselves by using existing money, owned by wealth owners, obtained by issuing shares or bonds, and it does not consider that firms can substitute their debt with the banks by the issue of shares or bonds; (3) it overlooks the fact that bank credit can also be used to finance the acquisition of existing capital goods; (4) it overlooks the presence of non-bank intermediaries.[11]

However, this model has an important advantage: the specification of the process of investment financing that is carried out within the credit market makes it possible to justify the Keynesian thesis that investments determine saving and not vice versa.[12] The inversion of the relation between investment and savings with respect to the tenets of the neoclassical theory 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. The process of credit money creation through which banks finance investment decisions was described by specifying the credit market and the monetary base market (Equations (1)–(7)). Central banks, banks and firms are the main actors in this phase. Investment decisions generate an increase in income, giving rise to a savings flow that is equivalent to investments. As well as deciding how much of his income to save, a saver must decide 'in what form he will hold the command over future consumption which he has reserved' (Keynes 1936, p. 166). The specification of the money market (Equations (9)–(11)) makes explicit the conditions under which the wealth holders are willing to accumulate the money created by the banks. The savings flow determined by investment decisions constitutes, as shown by Equations (10) and (11), a necessary element in order to determine these conditions. The explicit consideration of the presence of bank money enables us to affirm that investments and savings are determined in two separate logical steps: in the first step, the firms carry out the investments thanks to the money obtained from the banks, and at a different time, which is later than the first step from a logical point of view, an equivalent flow of saving caused by the variation of the income is determined. The rate of interest

therefore cannot be determined by saving and investment decisions because there is no ex ante saving to contrast with ex ante investment of firms.

4. Bank money and the characteristics of a monetary economy

The thesis put forward in this paper is that, in contrast to what Tobin stated, the presence of banks and bank money constitutes the necessary element for explaining the structural changes that distinguish a *monetary economy* from a *real exchange economy*. To illustrate this theory it is necessary to highlight the function of banks that Tobin neglected; that is, it is necessary to highlight the process of money creation carried out by the banks to finance firms' investment decisions. It will be shown that the specification of the presence of bank money and of the two phases of the money creation process allows us to provide an explanation of the monetary nature of the fluctuations in the effective demand which is sounder than that based on the liquidity preference theory and on Tobin's theory of financial intermediaries.

To this end, it is useful to recall the key aspects of the liquidity preference theory. Keynes 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.[13] He 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 states 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, p. 32). In Chapter 13 of the *General Theory,* Keynes criticises the classical theory that states that the interest rate does not depend on saving decisions but on the liquidity preference. 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.[14] Moreover, 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 authorities and that it can vary independently of the money demand. He therefore concludes 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 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. Tobin set out to create a more general macroeconomic model than the one associated with the *General Theory*, which is based on the assumption that all assets other than money are perfect substitutes, and concludes that the elimination of the assumption of perfect substitutability and the presence of financial intermediaries does not modify the nature of the monetary policy transmission mechanism defined in the *General Theory*, even though the quantitative effects of a given variation in the quantity of money will, of course, be different (see Tobin 1969).

Unlike Tobin, I believe that the explicit consideration of the presence of banks and the process of bank money creation reduces the relevance of the explanation of income

fluctuations and of the criticism of Say's law based on the liquidity preference theory. I think that the liquidity preference theory and Tobin's approach tend 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 e.g. 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 e.g. 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 that coherent with full employment. We must recognise that the explicit consideration of the bank money creation mechanism that characterises the theory of money endogeneity reduces the importance of the liquidity preference theory in explaining the fluctuations in aggregate demand and therefore in income and employment.

I further hold that there is a second limitation in the liquidity preference theory: this theory assumes, as recalled above, that there is uncertainty. Uncertainty, in particular about the future rate of interest, is the exogenous element starting from which Keynes, in the *General Theory*, justifies the store of wealth function of money and formulates the liquidity preference theory. 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.[15] Keynes defines the fluctuations in aggregate demand that give rise to booms and depressions as 'a monetary phenomenon' (Keynes 1933b, p. 85) in as much as these fluctuations depend on the particular characteristics of money used in a *monetary economy*. He explains this concept by observing that in a *monetary economy* or, as it is otherwise defined, in an *entrepreneur economy,* the presence of money changes the law of production compared 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. (Keynes 1933a, pp. 81–82)

The presence of money not only changes the unit of measurement with which the marginal proceeds are expressed, but above all it changes the nature of the marginal 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* or, as it is otherwise defined, in an entrepreneur economy, the marginal productivity of labour as the presence of money makes fluctuations in the aggregate demand possible; in this case firms are not sure that they will sell everything they produce:

> 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 economy the fluctuations of effective demand may be the dominating factor in determining the volume of employment. (Keynes 1933a, p. 80)

In a *monetary economy*, entrepreneurs take their decisions on the basis of an expectation of future revenues expressed in monetary terms. The relevant aspect of this conclusion does not, of course, relate to the unit of measurement as expectations could be expressed in terms of unit of production, but it relates to the fact that expectations are elaborated by entrepreneurs in conditions of uncertainty due to the fluctuations in the effective demand which makes it impossible to predict future profits in probabilistic terms. As Keynes considers fluctuations in effective demand a monetary phenomenon, we must conclude that the presence of money constitutes the necessary condition to justify the importance of the dimension of uncertainty. In other words, we must conclude 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 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 as an element that distinguishes a *monetary economy* from the economy described by the classical theory, to become central.

To define this relation, it is necessary to explain what are the characteristics of money that permit us to consider the fluctuations of effective demand as a monetary phenomenon. Keynes stresses that the characteristic of money that allows us to define the fluctuations of effective demand as a monetary phenomenon is the fact that it is not produced by means of labour.[16] If money was a good which could be produced by labour, as in the case of gold, fluctuations in the aggregate demand would not lead to persistent unemployment because the unemployed could, at least theoretically, set about mining gold (Keynes 1933a, p. 85). In the *General Theory,* Keynes defines two essential properties of money: (1) zero elasticity of production and (2) 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). In his works written after the *General Theory,* as we have seen, Keynes considers a particular money that is not produced by labour, that is bank money.

The thesis put forward in this paper is that the explicit consideration of the presence of bank money and of the endogenous money theory enables us to highlight two fundamental characteristics of a *monetary economy*: (1) a *monetary economy* is characterised by the presence of uncertainty and (2) fluctuations of effective demand are a monetary phenomenon and Say's law does not apply. In the following two sections, these two characteristics of a monetary economy will be analysed.

4.1. *Money and uncertainty*

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.[17] Naturally, it would be excessive 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. 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 breakout 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. 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 years 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 easily foreseeable because they do not coincide with the productivity of some specific productive factors 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 realisation of a new product, the introduction of a new productive method or the opening of new markets.

Just like the innovations of the Schumpeterian entrepreneur, the investments of the Keynesian entrepreneur do not consist of merely adding to the existing stock of capital goods new units of capital goods identical to the existing ones, i.e. they do not simply consist in the production of new fishing boats. Instead, these are the characteristics of the investments described by Tobin; in fact, he assumes that there is a stock of homogenous physical capital, for example a certain number of fishing boats, and that these capital goods last forever and generate a perpetual stream of returns. He therefore assumes that the investment decisions consist in adding to the existing stock of capital new units of capital identical to the existing one. He further assumes that the value of existing capital goods can be different from the price of newly produced capital goods and that investment decisions increase when the market value of existing capital goods exceeds their cost of reproduction, that is, when Tobin's q is greater than one.

Keynes recognises that the variations in the prices of the existing capital goods represented by the changes in the quotation of shares in the security markets can influence current investments, but he separates these investments from those that he associates with the figure of the entrepreneur and the concept of enterprise.[18] The investments of the Keynesian entrepreneur can be considered as the tool through which innovations are introduced, so the Keynesian entrepreneur who takes the investment decisions coincides with the Schumpeterian entrepreneur who introduces innovations.[19] 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 using whatever they produce either as a consumer good or as an investment good 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, p. 65).

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.*[20]

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 10 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 also be built in a *corn economy*[21]; 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.

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 10 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.

The risks associated with the railway construction do not fall on the corn producers but on the bank and on all those who accumulated 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; 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; 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.

4.2. *Bank money and Say's law*

The second important structural change that can be associated with the presence of bank money relates to the fact that in a *monetary economy* Say's law does not apply. The typical Keynesian explanation is based on the liquidity preference theory; in the previous paragraphs we underlined the limits of this explanation. We can formulate a different explanation for the reasons why in a monetary economy that uses bank money and in which the endogenous money theory holds, Say's law does not apply. In order to illustrate this thesis, we can suppose that there exists a positive value of the interest rate so low to cause a flow of demand for investment goods coherent with the full employment income.[22] In the world described by the classical theory when the interest rate assumes that value, which, following Wicksell, we can define the natural rate of interest, there will be a flow of credit supply, determined by saving decisions, which is equal to the flow of investment coherent with the full employment income. In this case, Say's law is satisfied and banks are only intermediaries, which lend what is lent to them by savers.

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.[23] However, this conclusion is based on a weak hypothesis which assumes that investment decisions depend only on the rate of interest and that banks always create the flow of money necessary to finance the investments desired by firms. Kaldor and other supporters of the endogenous money theory maintain that the banks meet only the credit demand of firms they deem to be creditworthy. This means that once they have fixed the rate of interest on money, the banks are not necessarily willing to satisfy the whole credit demand from firms.[24] The banks could, for example, consider the construction of the railway too risky; in this case the workers who could have built the railway will not be employed and there will not be sufficient demand for corn to absorb all the production. 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.

This bank behaviour can be explained by the presence of uncertainty which, as we have seen, characterises a *monetary economy* in which there is a consistent flow of investments financed through the creation of bank money. In condition of uncertainty, that is, in a situation in which, according to Keynes (1937a, p. 114): 'there is no scientific basis on which to form any calculable probability whatever' on the future returns on investment decisions, we may suppose that banks and entrepreneurs have different expectations about the future results of the same investment projects; this triggers fluctuations in the flow of investments and therefore in the aggregate demand that can be defined a monetary phenomenon in that they are associated with the presence of bank money.

4.3. *The question of the financial system regulation*

The arguments presented above enable us to draw some observations about the role of the banking system in the global financial crisis and about the question of the financial system regulation. We have seen that in a *monetary economy* the banking system is not a neutral institution. The presence of banks and the use of bank money are the necessary condition for the development of an economic system based on the introduction of innovations that uninterruptedly change the production structure. In a *monetary economy* uncertainty is not merely an exogenous dimension, but it becomes a factor whose presence is explained by the spread of bank money: banks and bank money create uncertainty.

Awareness of the banks' social function of selector of innovating entrepreneurs leads Schumpeter (1939, pp. 90–91) to specify the features of the banker's behaviour. In the first place, the banker must know how to assess the characteristics of the investment project to be carried out and the personality of the entrepreneur. Secondly banks must stay independent of the firms and political power.[25] Schumpeter (1939, p. 91) underlines that if the banks behave improperly the consequences can be disastrous; the wrong decisions of the banks are 'sufficient to turn the history of capitalism evolution into a history of catastrophes'.[26] Schumpeter's remarks about the disastrous effects of the improper behaviour of banks have also been taken up in some contemporary studies. The most important example is the analysis carried out by Minsky (1975, 1980, 1982), who had been a student of Schumpeter, which highlights the crucial role of the banks in explaining the instability of capitalism. Minsky's analysis of the financial nature of the instability of capitalism is closely connected with the observations that in the presence of uncertainty the banks' evaluation can change suddenly, causing considerable instability in the economic system. Minsky explains that the alternation of phases of boom and bust is due to changes in banks' criteria in appraising firms' investment projects. There is an endogenous tendency towards instability, since, in normal periods, firms' ability to repay their loans constitutes a confirmation of the validity of their forecasts, and induces banks to believe that they applied excessively rigid criteria in evaluating the firms' requests for credit. The upshot of this is that firms will be encouraged to consider more risky investment projects, and banks will be led to adopt less rigid selection criteria. This behaviour transforms a normal situation into a boom fuelled by speculative investments. The relationship between bank money and innovations described above can bolster the explanation of the alternating boom and bust phases. The introduction of innovations is a phenomenon capable of raising profit expectations owing to the conviction that a new era replete with unprecedented opportunities, arising out of unfolding events, is afoot.[27] The anticipation of a new era founded on innovations can render any project, even the most unlikely one, worthy of financing, as long as it is connected with the new innovating revolution.[28]

The specification of the relationship between bank money and innovations allows us to highlight another feature that characterises a monetary economy: speculation. The example of the financing of the building of the railway described previously shows that the implementation of innovations may require long-term financing and then determines the creation of long-lasting credit and debt relationships. This means that a monetary economy is characterised by the presence of two groups of agents, wealth owners and debtors, and of financial markets in which assets that represent positions of credit and debit are continuously exchanged. Under these conditions it becomes important to distinguish between enterprise and speculation; Keynes assigns 'the term *speculation* for the activity of forecasting the psychology of the market, the term *enterprise* for the activity of forecasting the prospective yield of assets over their whole life' (1936, p. 158). The aim of speculators is to try to make a profit thanks to the continuous variation in prices of financial assets. These concepts allow us to explain the explosion of the phenomenon of securitisation that has transformed the banks and that Stiglitz describes it this way:

> The lure of easy profits from transaction costs distracted many big banks from their core functions. The banking system in the United States and many other countries did not focus on lending to small and medium-sized businesses, which are the basis of job creation in any economy, but instead concentrated on promoting securitization, especially in the mortgage market. It was this involvement in mortgage securitization that proved lethal. In the Middle Ages, alchemists attempted to transform base metals into gold. Modern alchemy entailed the transformation of risky subprime mortgages into AAA-rated products safe enough to be held

> by pension funds. And the rating agencies blessed what the banks had done. Finally, the banks got directly involved in gambling. (2010, p. 6)

The uncontrolled growth of the phenomenon of securitisation is in contrast with the first Schumpeter's precept on the behaviour of the banker who 'must not only know what the transaction is which he is asked to finance and how it is likely to turn out, but he must also know the customer, his business, and even his private habits, and get, by frequently "talking things over with him", a clear picture of his situation. . . . if banks finance innovation, all this becomes immeasurably more important'. (Schumpeter 1939, p. 90) This rule of behaviour is justified by the fact that banks by financing the construction of the railway push the whole society to bear the risks of this operation, so they have the institutional duty to assess with care the characteristics of the project to be financed. The securitisation process removed the conditions that induce the banks to behave in this way, so it is necessary to reform the process of securitisation in order to lead the banks to finance the entrepreneurs that they consider creditworthy. As noted by Roubini and Mihm:

> The most important angle of securitization reform . . . is the quality of the ingredients. In the end, the problem with securitization is less that the ingredients were sliced and diced beyond recognition than that much of what went into these securities was never very good in the first place. Put differently, the problem with originate-and-distribute lies less with the distribution than with the origination. What matters most is the creditworthiness of the loans issued in the first place. (Roubini and Mihm 2010, p. 194)

The bad behaviour of banks is not the only factor that explains the housing bubble, so we mention two measures that have been proposed in order to make harder the recurrence of financial bubbles. The first provides a change in the strategy of the central banks that should worry not only about the prices of goods that make up the gross national product (GNP), but also about the prices of financial assets.[29] The second measure is the introduction of a financial transactions tax to deter financial speculation, following Tobin's proposal presented in 1971.[30]

The objection usually raised against the introduction of measures aimed at regulating the financial markets is that they hinder the process of financial innovation, and then they cancel the linked benefits. In this respect, it seems appropriate to recall what was claimed by Galbraith (1990), according to whom financial transactions are not suitable for innovation. He said, in fact, that any financial innovation is nothing but the merely repetition of fundamental innovation which consists in the creation of bank money that makes possible the process of expansion of debt which is the requirement of any bubble and financial crisis.

5. Conclusions

Tobin's objective is to construct a more general theoretical model than that associated with Keynes's *General Theory*, a model in which the assumption of perfect substitutability between assets other than money is eliminated, and in which the presence of financial intermediaries is explicitly considered.

Tobin defines the role of banks by using a model of the capital account and concludes that there are no reasons to attribute a special role to banks. He criticises the 'mystique of money' and underlines the store of wealth function of money; this vision leads him to underline that the quantity of money and banks' dimensions are determined by the wealth owners' decisions and thus concludes that there are no reasons to invest them with any special role with respect to other intermediaries. According to Tobin, the presence of banks

and financial intermediaries does not alter the structure of the economic system whose essential aspects can be described by means of the money–capital goods model. Tobin concludes that the liquidity preference theory provides a good explanation of the reasons why a *monetary economy* is characterised by changes in income and employment and therefore of the reasons why Say's law is not valid.

This paper outlines that Tobin describes the analysis of the banks only partially as his models focus on the capital account of an economic system; if we extend the analysis and consider also the income account, a function of banks emerges that Tobin overlooks. We can define this function as the monetary function carried out by banks; this function does not consist so much in creating a liquid asset which satisfies wealth owners' portfolio preferences, but it consists, above all, in creating new money and in making existing money available for financing firms' investments.

It was recalled that Keynes explicitly considers this function of banks in the works in which he responds to the criticism levelled at the *General Theory* by supporters of the loanable funds theory such as Ohlin and Robertson; in these works Keynes uses the presence of bank money to eliminate the relation between saving decisions and the rate of interest that characterises the classical theory. In Section 4, it is underscored that the specification of the monetary function carried out by banks allows us to conclude, differently from Tobin, that the presence of banks and bank money radically changes the structure of the economic system. It has been emphasised that the specification of the process of bank money creation through which investments are financed allows us to formulate an explanation of the characteristics of a *monetary economy* which is sounder than that based on the liquidity preference theory. In particular, the explicit consideration of the presence of bank money enables us to highlight two fundamental characteristics of a *monetary economy*: (1) a *monetary economy* is characterised by the presence of uncertainty and (2) fluctuations of effective demand are a monetary phenomenon and Say's law does not apply.

Notes

1. 'A model of the capital account of the economy specifies a menu of the assets (and debts) that appear in portfolios and balance sheets, the factors that determine the demands and supplies of the various assets, and the manner in which assets and interest rates clear these interrelated markets'. (Tobin 1969, p. 16)
2. Tobin (1963, p. 411) specifies the factors that allow intermediaries to carry out their functions: 'The reasons that the intermediation of financial institutions can accomplish these transformations between the nature of the obligation of the borrower and the nature of the assets of the ultimate lender are these: (1) administrative economy and expertise in negotiating, accounting, appraising, and collecting; (2) reduction of risk per dollar of lending by the pooling of independent risks, with respect both to loan default and to deposit withdrawal; (3) governmental guarantees of the liabilities of the institutions and other provisions ... designed to assure the solvency and liquidity of the institutions'.
3. Tobin (1963, p. 415) concludes that even in the absence of reserve requirement, banks' dimensions are limited by the same factor that determines the size of other intermediaries: the presence of wealth owners who wish to hold intermediaries' liabilities. He maintains that 'it is more accurate to attribute the special place of banks among intermediaries to the legal restrictions to which banks alone are subjected than to attribute these restrictions to the special character of bank liabilities'. (Tobin 1963, p. 416)
4. 'Intermediation permits borrowers who wish to expand their investments in real assets to be accommodated at lower rates and easier terms than if they had to borrow directly from lenders'. (Tobin and Brainard 1963, p. 385)
5. Keynes uses the term *real exchange economy* to denote an economy in which money is just an instrument that makes it possible to reduce the costs of the exchange; the use of money does not change the structure of the economic system with respect to a barter economy. By the term

monetary economy, Keynes refers to an economy in which the presence of fiat money radically changes the nature of transactions compared with a *real-exchange economy*. (Keynes 1933a, p. 408)

6. '*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)
7. '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)
8. To describe the action of intermediaries, Tobin also specifies two distinct markets: that of their liabilities, the deposits in the case of the banks, and that of their assets. The difference between Tobin's analysis and the model described here is the fact that in this paper the credit demand is associated with investment decisions and therefore the credit market is associated with the income account.
9. This way of specifying the 'finance motive' differs from Keynes's definition, which considers finance as 'essentially a revolving fund' necessary to finance 'the planned activity by the entrepreneur or the planned expenditure by the public' (Keynes 1937c, pp. 219 and 221). The definition used in this paper coincides with that elaborated by Dow (1997, p. 72). It is moreover assumed that credit serves to finance only investments and not consumption. The demand for investment goods and consumption goods is financed in different ways: the first is financed by new money created by the banks while the second is financed by income received by workers. This point was underlined by Minsky (1980) and Dalziel (1996, 2001).
10. As Arestis and Howells state (1996, p. 541): 'The (flow) demand for new bank lending, on which the endogeneity case focuses, originates with one set of agents while the (new) deposits that are created by this lending have to be held by a different set. The first set, ("deficit units") is a subset of the latter ("wealth holders"). For the former, what is involved is an income–expenditure decision; for the latter it is a portfolio consideration'. See also Wray (1990, 1992), Howells (1995, 2006), Dow (1997), Palley (1996), Rochon (1999), Bertocco (2001, 2005), Fontana (2003) and Docherty (2005).
11. Examples of more elaborated models are contained in Godley (1999), Bossone (2001), Dalziel (2001) and Docherty (2005).
12. The relation between the presence of bank money and the causal nexus between investments and saving has been underlined in particular by Chick (1986). See also Kaldor (1982, 1985) and Kaldor and Trevithick (1981).
13. '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, p. 489)
14. '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)
15. '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, pp. 410–411)
16. 'It is the essence of an entrepreneur economy that the thing (or things) in terms of which the factors of production are rewarded can be spent on something which is not current output, to the production of which current output cannot be diverted ... and the exchange value of which is not fixed in terms of an article of current output to which production can be diverted without limit'. (Keynes 1933a, p. 85)
17. '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 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)

18. 'There is no sense in building up a new enterprise at a cost greater than that at which a similar existing enterprise can be purchased; whilst there is an inducement to spend on a new project what may seem an extravagant sum, if can be floated off on the Stock Exchange at an immediate profit. Thus certain classes of investment are governed by the average expectation of those who deal on the Stock Exchange as revealed in the prices of shares, rather than by the genuine expectations of the professional entrepreneur'. (Keynes 1936, p. 151)
19. 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) and Vercelli (1997); for a more detailed analysis see Bertocco (2007).
20. '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 animals 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, pp. 161–162)
21. In Bresciani-Turroni (1936) there is a similar example.
22. If we consider the discussion in the previous section regarding *animal spirits* and uncertainty, it does not necessarily follow that there must be a value of the rate of interest rate higher than zero with these characteristics.
23. The concept of optimal rate of interest 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, p. 21)
24. See for example Tobin (1980), Lavoie (1992, 2006) and Wolfson (1996). The credit rationing described in these works has different characteristics from that defined on the basis of the presence of asymmetric information (see Bertocco 2005, 2009).
25. '[Banks] must first be independent of the entrepreneurs whose plans they are to sanction or to refuse. This means, practically speaking, that banks and their officers must not have any stake in the gains of enterprise beyond what is implied by the loan contact. ... But another kind of independence must be added to the list of requirements: banks must also be independent of politics. Subservience to government or to public opinion would obviously paralyze the function of that socialist board. It also paralyzes a banking system. This fact is so serious because the banker's function is essentially a critical, checking, admonitory one. Alike in this respect to economists, bankers are worth their salt only if they make themselves thoroughly unpopular with governments, politicians, and the public'. (Schumpeter 1939, p. 92)
26. Schumpeter considers the bank/industry collusion as an element that can destroy entrepreneurial activity and innovations (see e.g. De Vecchi 1995, chap. 8).
27. Perez (2002, 2007) uses the Schumpeterian concepts of innovation and credit to explain the occurrence of boom phases marked by phenomena of speculation, financial innovation and 'irrational exuberance'.
28. With the introduction of innovations: 'Opportunities grow explosively. Innumerable entrepreneurs will offer their projects to the also growing number of financiers. If they seem to follow the new paradigm, all projects, good and bad, honest and crooked, are likely to have access to the required funds'. (Perez 2007, p. 792)
29. 'We don't mean to suggest that policy makers should impose drastic interest hikes to curtail bubbles. That would be dangerous. But a moderate, preemptive approach is appropriate, and far preferable to the current policy of doing nothing as bubbles grow, and then pulling out the stops when they finally pop'. (Roubini and Mihm, pp. 235–236) See also European Central Bank (2010).
30. See for example Krugman (2009).

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