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Do information asymmetries constitute a solid foundation for the elaboration of a Keynesian theory of credit and financial institutions?

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Introduction

In the last 20 years, the New Keynesians (henceforth, NKs) have developed a theoretical approach which aims to elaborate an alternative monetary theory to the one traditionally associated with Keynes. The distinctive feature of this new approach is its emphasis on the credit market and the role played by financial intermediaries rather than the money market; the importance given to the credit market is justified by the presence of asymmetrical information.

The objective of this paper is twofold: i) to show that the presence of asymmetric information constitutes a weak premise on which to build a Keynesian theory of credit and financial intermediaries; ii) to outline the elements on which a theory of credit consistent with Keynes's thinking can be built. The paper is divided into three sections. In the first one, the most important aspects of the NKs' theory are described; the limitations of this theoretical approach are then demonstrated in the second section; in the third section, the elements which should characterise a Keynesian theory of credit and financial institutions are outlined.

1. The theory of credit and financial intermediaries formulated by the New Keynesians.

This presentation of the most important aspects of the NKs' theory is essentially based on the works of J. Stiglitz and his collaborators, in particular B. Greenwald and A. Weiss. The NKs set out to highlight aspects of Keynes's thought neglected by the traditional interpretation.¹ The NKs' research develops along two lines: the first aims to provide a sound justification for the price rigidity hypothesis, while the second sets out to furnish a satisfactory explanation of Keynes's theory that the flexibility of prices and

¹ See: Greenwald and Stiglitz 1987.

wages can accentuate the instability of the economic system.² Following this second approach, the NKs formulate a theory that provides new justifications for the thesis of the non-neutrality of monetary variables.

The NKs start off by abandoning the perfect capital market hypothesis underlying the neo-classical theorems which support the theory of the irrelevance of money and the financial variables. The NKs maintain that the imperfections in the capital market caused by the presence of imperfect information give it an essential role in explaining how modern economies work.³ They stress that the credit market is profoundly different from other markets where a simultaneous exchange of goods for money takes place; in the case of credit, a given amount of goods or of money, available today, are exchanged against the promise of receiving a given amount of goods or money at a future date. The temporal dimension of the credit contract prompts creditors to gather information, which allows them to evaluate the debtors' ability to keep their promise to pay back the loan. The NKs make a distinction between two situations; the first one, in which there is symmetric information, corresponds to the case in which debtors and creditors have equal access to all the available information. In the second situation, characterised by asymmetric information, the creditors do not have at their disposal all the information possessed by the debtors. The conclusions reached by the NKs can be summarised in the following four points:

- i) the presence of asymmetric information renders the Modigliani-Miller theorem inapplicable;
- ii) the presence of asymmetric information justifies the existence of financial intermediaries and, in particular, of banks;
- iii) the presence of asymmetric information can determine a credit rationing equilibrium;
- iv) the presence of asymmetric information influences the characteristics of the monetary policy transmission mechanism.

The first result obtained by the NKs was to show that it is not the same for a firm to finance an investment project by issuing equities or by borrowing. They maintain that, in the presence of asymmetric information, it is more costly to get financing by a share issue than by borrowing, and they therefore conclude that the latter is the prevalent form of financing chosen by firms. The NKs reach this conclusion by applying to the capital market the results of a study carried out by Akerlof (1970).⁴ In Akerlof's model, the potential buyers of used cars are unable to discern the quality of the cars; in the case of the capital market, the NKs assume that potential share subscribers know only the expected return on the investment projects, while the firms have at their disposal information allowing them to know what the actual return on their project will be. If it is assumed that the yield expected from all the projects is the same, it must be concluded that the shares of all the firms will be issued on identical terms and that the best firms will be penalised. In this situation it is onerous for the best firms to issue equities; if the best firms finance themselves by borrowing, the firms with the less

² See: Greenwald and Stiglitz 1993.

³ "Capital is at the heart of capitalism... it is imperfections in the capital market – imperfections which themselves can be explained by imperfect information – which account for many of the peculiar aspects of the behavior of the economy which macroeconomics attempts to explain." Stiglitz 1992, p. 269. See also: Greenwald and Stiglitz 1991.

⁴ The influence which Akerlof's analysis had on the NKs' theory is important; on this point see: Stiglitz 1987, 2000; Ardeni, Boitani, Delli Gatti and Gallegati 1999; Messori 1999; De Meza and Webb 1987, Myers and Majluf 1984.

profitable investment projects will have to do likewise in order to avoid being identified by the market. In conclusion, in the presence of asymmetric information, the prevalent form of investment financing is borrowing.⁵

The second result obtained by the NKs is to show that the form of borrowing used by the firm is not the direct issue of bonds, but rather bank borrowing. Akerlof observed that the presence of asymmetric information stimulates the creation of institutions whose aim is to reduce information costs; in particular, Akerlof drew attention to the activity of the merchants who specialise in evaluating the quality of the goods.⁶ The banks play the same role in the capital market as the merchants play in Akerlof's used car market.⁷ The NKs introduce a key assumption; they observe that the banks are unable to perfectly screen firms, in other words, they are unable to gather all the information necessary to fully define the features of every investment project, which the firms intend to carry out.⁸ This hypothesis allows the NKs to state that, despite the presence of financial intermediaries, the capital market is still characterised by asymmetric information and so it works in a different way from a world in which there is perfect information.

The most important result that illustrates this conclusion is the demonstration that it is possible to reach a rationing equilibrium on the credit market. This result is the third element that characterises the NKs' theory. Starting from the hypothesis that every investment project has two features, the expected return and the risk, the NKs assume that the banks are able to identify the expected return of each project but not the degree of risk. The banks classify firms into different groups depending on the expected return on their investment project, and they apply the same interest rate to the firms belonging to the same group even if they know that these firms are not perfectly homogenous as far as the degree of risk is concerned.⁹ The presence of asymmetric information has an important consequence, as Akerlof points out in his analysis of the used car market: the quality of the merchandise exchanged depends on the price; in the case of the credit market the degree of riskiness of the loans granted by the banks varies in accordance with the interest rate applied. If it is assumed that the expected return on the investment projects is the same for all the firms which belong to the same group, then it can be demonstrated that if the interest rate applied by the banks rises, the probability of the loan being repaid declines, and this can cause a rationing equilibrium. Due to the adverse selection and incentive effects, an increase in the interest rate can bring about a sufficient increase in the riskiness of the loans to cause a reduction in the banks' expected profits. If there is an excessive demand for credit at the interest rate which maximises the banks' expected profit, there will be no reason for them to raise the

⁵ See for example: Myers and Majluf 1984; Greenwald, Stiglitz and Weiss 1984; Greenwald and Stiglitz 1987, 1990, 1993a, 1993b.

⁶ "In *our* picture the important skill of the merchant is identifying the quality of merchandise; those who can identify used cars in our example and can guarantee the quality may profit by as much as the difference between type two traders' buying price and type one traders' selling price. These people are merchants." Akerlof 1970, p.117.

⁷ See: Stiglitz and Weiss 1990; Blinder and Stiglitz 1983.

⁸ See: Jaffee and J. Stiglitz 1990; Stiglitz and Weiss 1990; Greenwald and Stiglitz 1991.

⁹ "Screening is, of course, never perfect: potential borrowers are placed into different loan categories but the bank is fully aware that, within any loan category, there are some risks (loans) which are better, or much worse, than others. Separating these good and bad risks perfectly is, however, if not impossible, at least too costly." Stiglitz and Weiss 1990, p. 93.

interest rate, as such a decision would trigger a drop in their expected profits; in such a case, a rationing equilibrium occurs.¹⁰

The fourth result obtained by the NKs concerns the description of the characteristics of the monetary policy transmission mechanism. The NKs observe that if there are no strict substitutes of bank credit, a monetary policy intervention based on credit supply control is much more efficient.¹¹ Moreover, if the credit market is in a rationing equilibrium, the monetary authorities can trigger substantial variations in the demand for investment goods by means of a monetary base manoeuvre, at a parity of interest rates.¹²

2 Some observations on the New Keynesians' theory.

It will be shown that the NKs' approach is conditioned by some weak elements; in particular, this approach:

- i) gives excessive importance to the presence of information asymmetries as a factor on which basis to elaborate a theory of credit and financial institutions;
- ii) considers dimensions such as time and uncertainty in a very different manner from Keynes;
- iii) elaborates a theory of financial intermediaries which seems somewhat incoherent.

In the following three paragraphs the reasons behind these critical evaluations shall be explained.

2.1 Information asymmetries and the NKs' theory of financial intermediaries.

The NKs' theory is based on two assumptions, the first of which is the presence of asymmetric information in the capital market. The second one concerns the behaviour of financial intermediaries: the NKs assume that banks are only able to partially screen debtors. This second assumption plays a fundamental role; if banks were actually able to obtain the same information possessed by the debtors, the conditions of perfect information would be created under which, according to the NKs, the creditors would directly finance the debtors and the intermediaries would not have any *raison d'être*. The NKs' thesis that the presence of asymmetric information justifies the existence of financial intermediaries implies acceptance of the specular thesis that if the condition of asymmetric information were eliminated, creditors would directly finance the debtors without any need for bank intervention.¹³ The NKs maintain that if the banks were able to obtain the same information as the debtors, the interest rate would behave just like

¹⁰ See: Stiglitz and Weiss 1981.

¹¹ See: Blinder and Stiglitz 1983, p. 300.

¹² See: Blinder and Stiglitz 1983; Greenwald and Stiglitz 1990; Stiglitz and Weiss 1992.

¹³ This approach is largely shared by scholars of the theory of financial intermediaries; see for example: James and Smith 1994, Lewis 1995.

any other price, and the equilibrium between credit demand and supply would coincide with the equilibrium between savings and investments:¹⁴

“What ensures that the number of individuals certified to be credit worthy, combined with those with cash resources, generates a demand for *current* resources equal to current supplies?... The answer provided by traditional micro-economic analysis is simple: if there is an excess demand for current resources, the real rate of interest will rise: as this happens, the demand for credit, i.e., the number of individuals seeking certification from the banking institutions... is reduced until demand equals supply at full employment for current resources. Similarly, potential borrowers with high expected yield projects will bid more for resources, resulting in an efficient allocation of resources. ... We now argue that, in economies characterized by ... information imperfections ... the price system may well not serve the information-equilibrating role assigned to it by conventional theory...”¹⁵

Hence, the presence of information asymmetry is the element that justifies a credit rationing equilibrium and prevents the credit market from reaching a position of equilibrium consistent with full employment.¹⁶

It will be argued that the presence of asymmetric information is a weak justification on which to base a Keynesian theory of credit and financial institutions, for two reasons. The first weak aspect concerns the assumption that financial intermediaries are unable to obtain all the information, which firms possess. This assumption was challenged by Allen and Santomero (1998), who observed that the spread of the IT revolution produced a significant reduction in information costs and therefore they conclude that these costs do not constitute a convincing explanation for the presence of financial intermediaries.¹⁷ I share Allen and Santomero's view on the impact of the technological revolution on information costs, especially if the assumption introduced by the NKs that there is information which enables the future results of investment projects to be specified is accepted. Let us assume that it is possible to represent the future results of an investment project using a probability distribution whose parameters can be defined once the necessary information has been obtained. It then becomes reasonable to conclude that the IT revolution tends to eliminate the costs necessary to define the returns on an investment project and the degree of risk it involves. Thus, if the banks' existence is justified by the presence of asymmetric information, it must be

¹⁴“...what impedes the standard equilibrating forces from working? In particular, why does not the interest rate adjust to equilibrate the demand and supply for credit at a full employment, non-inflationary level... Considerations of imperfect information impede the use of the interest rate as equilibrating mechanism.” Stiglitz and Weiss 1990, p.89.

¹⁵ Stiglitz and Weiss 1990, p. 101

¹⁶ “The fact that the return received by lender may *decrease* with an increase in the interest rate has one ..effect: it means that there may be credit rationing... It should be emphasized that these arguments apply so long as the bank does not have *perfect* information concerning borrowers. Banks categorize potential borrowers... But the categorization is never perfect... So long as either the adverse incentive or selection effects from raising interest rates is sufficiently strong, interest rates will not be used to equilibrate the loan market.” Stiglitz and Weiss 1990, p. 98.

¹⁷ “... the advent of the technological revolution has substantially reduced the cost of information and reduced information asymmetry. Yet it did not reduce the need for intermediary services and encourage direct lending by households. In fact, the data suggest the opposite. In short, the decline in frictions which were allegedly the market imperfections that led to a need for intermediation services has not reduced the demand for them. Intermediation is growing and prospering even as the frictions decline.” Allen and Santomero 1998, p. 1465; see also: Scholtens and Van Wensveen 2000.

concluded that the elimination of information costs drives the economy towards a situation in which the banks no longer have a *raison d'être*.

The second weak element is the NKs' unconvincing reasoning that, in the absence of asymmetric information, the credit market should reach a full employment equilibrium. The NKs maintain that the presence of asymmetric information provides a satisfactory answer to the question to which it is widely held that a theory of financial intermediaries should respond. This question is formulated by starting from the seemingly obvious and common sense consideration that the presence of creditors and debtors is the necessary premise to justify the existence of financial intermediaries; intermediaries can only emerge in a world in which debtors and creditors exist. In this situation, the recourse to financial intermediaries involves a cost for debtors and creditors, therefore the theory should explain what are the advantages, deriving from the presence of the intermediaries, which can offset costs.¹⁸ The presence of asymmetric information seems to provide a good answer; the service offered by the intermediaries consists in information gathering. If you follow this view, you must accept the conclusion that when information costs tend towards zero, the reasons that justify financial intermediaries are no longer valid. Moreover, if you believe that the credit supply depends on savings decisions, it must be concluded that in the absence of asymmetric information the neo-classical theory of credit holds.¹⁹

To show the weakness in this argument, I present two models in which the absence of asymmetric information does not lead to the acceptance of the neo-classical credit theory. The first example is the theory of credit and financial intermediaries formulated by Tobin in the 1960s.²⁰ There are two interesting aspects to this theory: i) as in the case of the NKs, the presence of debtors and creditors is considered a necessary condition for the existence of financial intermediaries; ii) there is no reference to the presence of asymmetric information. As is well known, Tobin maintains that the function of financial intermediaries is to satisfy the different portfolio preferences of two groups of operators: the wealth owners and the debtors. The intermediaries play this role by differentiating the risk and liquidity characteristics of their assets and liabilities; they are able to do this because they exploit the advantages gained from handling a large number of financial operations.

For the purposes of our analysis, the important element of this theory regards the specification of the factors that determine the quantity of credit given by the banks. Tobin analyses how the credit market works by using capital account models in which only those wishing to buy capital goods greater than their wealth ask for credit. In these models, the credit supply is independent of saving decisions. Tobin maintains that bank size depends on the same factors that influence the size of the other intermediaries, in particular, the banks' credit supply depends on the willingness of the public to absorb bank deposits. Since the willingness to absorb liabilities issued by the banks reflects a choice concerning the composition of wealth, the credit supply is independent of the savings decisions, and the credit market equilibrium by no means implies full employment.

¹⁸ See: Hellwig 1991.

¹⁹ Bernanke (1993, p. 50) also emphasizes the link between savings and credit supply: "By credit creation process, we mean the process by which, in exchange for paper claim, the savings of specific individuals or firms are made available for use of other individuals or firms..."

²⁰ See: Tobin 1961; 1963; 1969; 1982; Tobin and Brainard 1963.

Tobin's analysis departs from the NKs' in that it does not give much importance to the relation between credit demand and investment decisions which characterises a model describing flow variables. The second example is elaborated by incorporating this relation and it shows that, also in this case, the absence of asymmetric information does not imply acceptance of the neo-classical credit theory. This result is justified by the characteristics of the credit supply function defined on the basis of the theory developed by Keynes after the publication of the *General Theory*. The model is presented in the third section, after Keynes's views have been recalled.

2.2 Credit, time and uncertainty.

The attention given to the credit market leads the NKs to underline the importance of the temporal dimension of economic decisions. The second weakness in the NKs' approach is, in my view, that it gives importance to time in a way which differs significantly from Keynes's; I believe that Keynes's comments allow us to elaborate a more meaningful explanation of the banks' role than the one put forward by the NKs.

As is well known, Keynes stresses that the fundamental difference between his own theory and the classical one regards the assumptions about the way in which expectations regarding future results of economic decisions are formulated. The classical theory assumes that it is possible to define the future results of economic decisions through objective criteria defined by the probability theory and by actuarial mathematics. Keynes, however, deemed that criteria inappropriate, and maintained that economic decisions are taken in conditions of uncertainty.²¹

The NKs' approach varies significantly from Keynes's: the asymmetric information assumption presupposes that information which enables the future results of investments to be predicted does exist, and in many examples it is assumed that if the operators had the same information they would come up with the same forecasts.²² Keynes held that there are no objective methods for representing the future results of an investment project; the presence of uncertainty is linked to the continuous structural change in the economic system which prevents the use of the past and the present as a reliable guide for forecasting the future consequences of economic decisions.²³ As is well-known, Keynes develops an explanation for the income fluctuations based on two elements, both of which are influenced by the presence of uncertainty: the first is the instability of demand for investment goods; the second is the presence of speculative money demand on which the Keynesian theory of interest rates is based. In the third section of this paper it is argued that the presence of uncertainty constitutes an important element in the formulation of a theory of credit and financial institutions.

²¹ See: Keynes, 1937a, CW. XIV.

²² The difference between the NKs and Keynes in relation to the concept of time and the definition of the future investment results is forcefully underlined by the post-Keynesians; see for instance: Davidson 1991, Crotty 1996; Wolfson 1996; Dow 1998; Isemberg 1998; Piegay 2000.

²³ Keynes 1937, p. 114. On this point, see: Davidson, 1991, 1998; Dow 1998.

2.3 Asymmetric information and the presence of banks: a weak explanation

The final weak component of the NKs' approach is the way in which it explains the presence of banks. As we have seen, this explanation is based on the following points: i) the presence of asymmetric information makes financing through a share issue more costly than financing through borrowing; ii) the presence of asymmetry stimulates the creation of intermediaries who specialise in information gathering; iii) the banks' ability to collect information is imperfect; despite their presence, a situation of asymmetric information, which makes a credit market rationing equilibrium possible, persists. It can be shown that there is a contradiction in this sequence. Let us recall that the NKs' approach is based on the assumption that it is possible to attribute values representing the expected yield and the degree of risk to the future yield of each investment project; the asymmetric information between debtor and creditor can relate to one or both of these values. The first result obtained by the NKs, that it is more costly to finance projects through shares than through borrowing, is based on the presence of asymmetric information regarding the yield. In this case, the cost of the share issue stimulates the creation of intermediaries, such as the banks, which specialise in information gathering. The NKs assume that banks are able to obtain information concerning the expected yield on investment projects but they are unable to identify the degree of risk; the persistence of this situation of asymmetric information between banks and firms justifies the existence of a rationing equilibrium. This result appears to me to have a shortcoming: it has been shown that in the presence of asymmetric information concerning solely the degree of risk, the form of optimal financing becomes the issue of shares and not bank borrowing.²⁴ The reason for this result is intuitive: if the banks are not able to know the risk involved in each individual project, they will finance all the firms at the same interest rate. This situation penalises the less-risky firms, who will find it more convenient to issue shares since, if the expected return on the firms' investment projects is the same, the issue of shares will not penalise the best firms and it will eliminate the possibility of rationing taking place.²⁵

To overcome this criticism, Hellman and Stiglitz (2000) have formulated a model in which there are two types of financiers specialising in the provision of two types of financing instruments: the banks which give credit and the private equity funds which subscribe shares; they assume that the two intermediaries do not know either the expected profit or the riskiness of the investment projects and they show that, in these circumstances, rationing can again occur.²⁶

Hellman and Stiglitz's analysis seems to suffer from one limitation: if it is assumed that banks do not know either the expected yield or the risk, then it can no longer be said that their role is to collect information. To save the credit rationing result, Hellman and Stiglitz do not bother to explain the reasons for the banks' existence and consider

²⁴ See: Cho 1986; De Meza and Webb 1987; Hillier 1997.

²⁵ See: Cho 1986; D Meza and Webb 1987; Hillier 1997.

²⁶ "If there is asymmetric information about both (expected return) and (risk), and if there are two types of investors specializing in debt and equity respectively, then it is possible that there is credit rationing, equity rationing or both." Hellman and Stiglitz 2000, p. 295.

their presence as given.²⁷ I believe that this is an important limitation because, if the banks do not collect information, it is difficult to see why the creditors do not directly finance the debtors, thereby avoiding to pay the intermediation costs.

3 Credit, financial institutions and uncertainty

In the next section, three elements that I believe should characterise a Keynesian credit theory are described, while the subsequent section contains a discussion on three outstanding issues, which must be dealt with in order to develop a complete theory.

3.1 Credit and spending decisions

The first element that, in my opinion, should characterise a Keynesian credit theory is the definition of the credit market that emerges from Keynes's response to Ohlin's criticisms of the interest rate theory contained in the *General Theory*. Responding to Ohlin, Keynes recognises that, in a monetary economy, the availability of money constitutes the necessary condition for the realisation of a spending decision. He also emphasises the fundamental role of the credit market, understood as a place in which the new money created by the banks or the existing money available to wealthholders is given to firms that ask for credit to finance investments. Keynes recognises that spending decisions can be influenced by the lack of liquidity but, in contrast to Ohlin, he underlines that the credit supply does not depend on savings decisions:

“... 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. On the other hand, there will always be *exactly* enough *ex post* saving to take up *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.”²⁸

Building on Keynes's reasoning, we can define the credit market as the place in which purchasing power is put at the disposal of firms which intend to make

²⁷ Bhattacharya and Takor (1993, p. 19) assert that: “... rationing models fails to address the role of the bank itself: the bank is merely a conduit for moving resources from savers to borrowers without any further justification”

²⁸ Keynes, 1937, CW XIV, p. 222.

investments; in this market are not transferred resources generated by savings decisions, but rather liquidity, newly created or already available means of payment. This definition of the credit market diverges from the neo-classical theory's logic of the exchange, namely, that in the credit market resources are transferred from savers to debtors. According to the Keynesian framework, the credit supply is determined by the financial institutions and it is independent of the saving decisions. The credit relation concerns the banks and the debtors, while the savers' accumulation of the financial instruments issued by the banks is a consequence of, and not a requirement for, the provision of credit. The presence of the credit market prompts us to modify Clower's well-known statement that a monetary economy is an economy in which money buys goods, goods buy money but goods do not buy goods. A monetary economy in which the credit market functions is an economy in which it is not necessary to either sell goods or reduce the demand for consumer goods in order to have money.²⁹ Starting from this definition of the credit market, it is obvious that a key role is played by the banks, which, as Keynes remarks, are institutions which grant credit by creating new means of payment.

Building on these elements, it is possible to describe a second example which shows how the absence of asymmetric information does not imply that the neo-classical theory is valid. Unlike the Tobin case, in this example it is assumed that the credit demand is justified by the firms' investment decisions. Let us consider a system composed of four markets: money in the form of bank deposits, bank credit, shares and goods. Let us suppose that the banks' balance sheet can be represented as follows:

a) $D + CD = ROB + L$

The banks issue two types of liabilities: deposits (D) which have a return equal to zero and certificates of deposit (CD); we assume that the CDs are considered by the wealth owners to be perfect substitutes of the shares and so the banks pay an interest rate equal to the bond rate r_b on these liabilities.³⁰ The banks' assets comprise the loans (L) and the required reserves (ROB) which are proportional to the deposits according to the equation:

b) $ROB = q_k D \quad q_k < 1$

Let us suppose that the banks provide financing by means of a standard debt contract which provides that the firms, if successful, repay the loans plus the interest; if unsuccessful, the banks shall obtain the whole result of the investment. Let us assume that the banks behave in an oligopolistic manner; their objective is to obtain an expected profit rate ρ^* , applying a mark-up $(1 + q)$ at the rate r_b , according to the equation:

c) $\rho^* = (1 + q)r_b$

To achieve this objective the banks will have to apply an adequate interest rate value r_l to the loans given to firms. In order to determine this value we have to make some assumptions about the characteristics of firms and the information available to banks. Let us suppose, as a preliminary approximation, that the firms which ask for

²⁹ This definition of the credit market is also found in Schumpeter, who maintained that: "... we define the kernel of the credit phenomenon in the following manner: credit is essentially the creation of purchasing power for the purpose of transferring it to the entrepreneur, but not simply the transfer of existing purchasing power. The creation of purchasing power characterises, in principle, the method by which development is carried out in a system with private property and division of labor." Schumpeter 1912 (1934), p.107.

³⁰ See: Romer and Romer 1990.

credit are perfectly homogenous: every firm intends to realise an investment project whose cost is equal to K , and asks for an amount of credit equal to K . All the projects have the same characteristics: if successful, they enable a result equal to $R > K$ to be obtained with probability equal to p , and, if unsuccessful, a result equal to K with probability equal to $(1-p)$. If we suppose that firms are indifferent to risk, they will decide to ask for a loan if their expected return $E(\Pi)$ is higher than zero; since the banks give loans at the rate r_l , we get:

$$d) E(\Pi) = [R - (1 + r_l)K]p$$

The maximum interest rate which firms are willing to pay will therefore be:

$$e) r_l^* = R/K - 1$$

The profit expected by the banks will be equal to:

$$f) E_b(\Pi) = p(1 + r_l)K + K(1 - p)$$

from which we get the expression of the expected rate of return:

$$g) \rho = (E_b(\Pi) - K)/K = r_l p$$

To obtain an expected rate of profit of ρ^* , the banks will have to apply an interest rate of $r_l^* = \rho^*/p$ on the loans; the banks will be able to set this rate if: $r_l^* = r_l$.

We can describe the model using the following equation:

$$1) D = (1/q_k)MB$$

$$2) D = D(Y; r_b)$$

$$3) \rho^* = (1 + q)r_b$$

$$4) r_l^* = \rho^*/p$$

$$5) L = L(I(r_l^*))$$

$$6) CD = L + MB - D$$

$$7) Y = Y(I(r_l^*))$$

This model is composed of seven equations and seven unknowns: D ; Y ; r_b ; ρ^* ; r_l^* ; L ; CD , Y . By manoeuvring the monetary base (MB), the monetary authorities determine the quantity of deposits (eq. 1); the equations 2, 3, 4 and 7 determine: r_b ; ρ^* ; r_l^* , Y . Equations 5 and 6 describe the credit market: given the variables: ρ^* and r_l^* , equation 5 determines the quantity of credit requested by firms as a function of the investment flow, while equation 6 determines the amount of DCs which must be created by the banks in order to adjust the supply of credit to the demand. As the reserve requirement regards only that component of liabilities which is composed of deposits, D , the banks can expand the credit independently of the amount of the monetary base, creating CDs. Credit is an endogenous variable, independent of the saving decisions; in this case, the banks adjust the credit supply to the demand. The credit supply is not influenced by saving decisions, the savings flow is a consequence of investment decisions; there is no guarantee that the credit market equilibrium is compatible with full employment.

In this model, the presence of asymmetric information does not change the characteristics of the credit markets and in particular of the credit supply function, it simply influences the value of the interest rate applied on loans by the banks. Let us, in fact, suppose that firms can be divided into two groups depending on the characteristics of the investment projects which they intend to realise.³¹ Let us also suppose that the projects of the firms which belong to group i obtain, if they are successful, a value equal to R_i with probability p_i and, if they are not successful, a value equal to K with

³¹ The assumptions introduced are the same as those used by the NKs to illustrate the possibility of a rationing equilibrium.

probability $(1 - p_i)$. On the other hand, the projects of the firms which belong to the group $-j-$ shall obtain, in the event that they are successful, a result equal to R_j with probability p_j and in the event that they are not successful, a value equal to K with probability $(1 - p_j)$. Let us further suppose that the expected value of the two investment projects is the same; hence we get:

$$h) E(R_i) = E(R_j) = M > K$$

As the expected return of the two projects is the same, the less risky project is also the project that, if successful, will produce the lower result. If, for example, it is the case that: $p_i > p_j$, then we will also get: $R_i < R_j$. This implies that the maximum interest rate that the firms of group $-i-$ will be willing to pay shall be inferior to the one that the firms of group $-j-$ are willing to pay. On the basis of equation e) we can state that the maximum rate that firms of group $-i-$ are willing to pay will be equal to: $r_i' = R_i/K - 1$, while the maximum rate that the firms of group $-j-$ are willing to pay will be equal to: $r_j' = R_j/K - 1$.

The banks' problem is to stabilise the interest rate to apply to firms in order to obtain an expected rate of return equal to ρ^* . The solution to this problem will depend on whether or not there is asymmetric information. If the banks were perfectly able to recognise to which group each firm belongs, they would apply two different interest rates. On the basis of equation f) we can observe that the expected profit flow deriving from the loans to firms of group $-i-$ will be equal to:

$$i) E_b(\Pi_i) = p_i(1 + r_i)K + K(1 - p_i)$$

from which we get:

$$l) \rho_i = (E_b(\Pi_i) - K)/K = r_i p_i$$

So, in order to obtain an expected rate of return of ρ^* on the loans granted to the companies of group $-i-$, the banks will have to apply to them a rate equal to: $r_i^* = \rho^*/p_i$. In the same way, in order to obtain an expected rate of return of ρ^* on the loans granted to firms of the group $-j-$, the banks will have to apply to them a rate of: $r_j^* = \rho^*/p_j$.

In the case in which the banks are not able to distinguish between the firms belonging to the two groups, they will apply just one rate of interest. As r_i' is the maximum value of the interest rate which the companies of group $-i-$ are willing to pay, for values of $r_i = r_i'$, both groups of firms shall ask for credit; therefore the expression of the expected rate of return of the banks shall be:

$$m) \rho_{ij} = r_i p_i n_i + r_j p_j n_j = r_i (p_i n_i + p_j n_j)$$

where n_i and n_j represent the proportion of group $-i-$ and group $-j-$ firms out of the total.

In this case, in order to obtain an expected rate of return of ρ^* the banks will have to apply an interest rate of:

$$n) r_i^* = \rho^*/(p_i n_i + p_j n_j)$$

This value will be between r_i' e r_j' ; in the presence of asymmetric information, therefore, the firms of group $-i-$ pay a higher rate than they would in the case of perfect information.

We can illustrate these different situations of equilibrium using figure 1, which plots the expected rate of return of the banks on the ordinates, and the interest rate applied on loans on the abscissae.³²

³² This figure is taken from Hillier 1997.

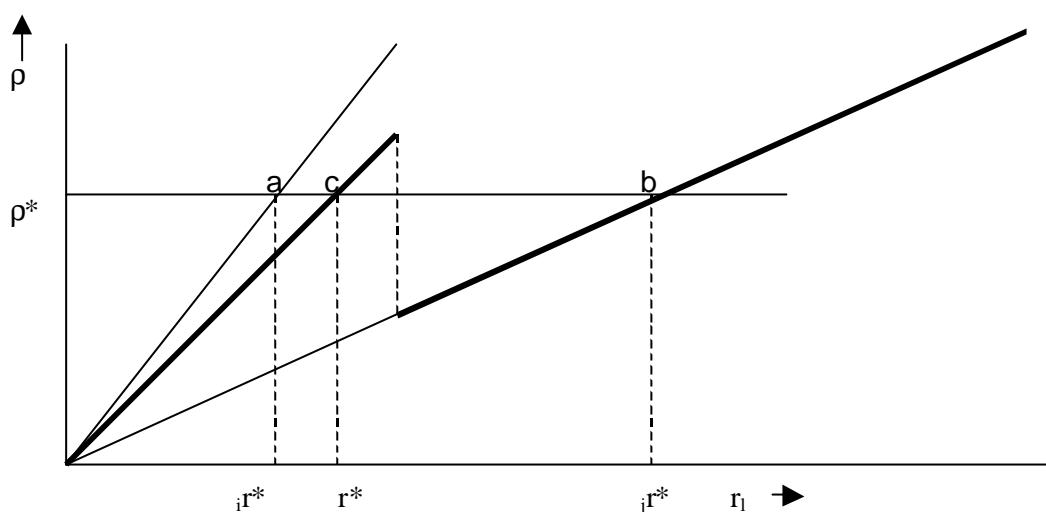


Figure 1

In the case of perfect information we get two different relations: the steeper line, with slope equal to p_i , represents the relationship between the profit rate expected by the banks and the interest rate applied on the loans granted to the firms of group $-i-$; the less steep line, with a coefficient of p_j , represents the relation which corresponds to the loans provided to the firms of group $-j-$. The broken curve represents the relation between the interest rate applied and the expected rate of return in the case of asymmetric information. This curve is discontinuous at the point where the interest rate is r_l^* . Given the target value of the expected rate of return ρ^* , the values of the interest rate which should be applied by the banks can be read on the plotted curves. In the case of perfect information, the banks will apply two different rates: the rate which corresponds to point $-a-$ will be applied to the group $-i-$ firms, and that which corresponds to point $-b-$ to group $-j-$ firms. In the presence of asymmetric information, on the other hand, the banks apply the rate which corresponds to point $-c-$ to all the firms.

It must be emphasised that, in this model, the presence of asymmetric information does not alter the characteristics of the credit market: in both the case of perfect information and asymmetric information, the amount of credit granted is in no way influenced by the savings decisions.

It should be pointed out that, although the NKs generally conceive of the credit market as a place in which the resources accumulated through savings are exchanged, they sometimes define the credit market in a manner similar to that found in Keynes's response to Ohlin. For example, Stiglitz and Weiss (1990, p. 105) state that:

“Credit is not like an ordinary good. It is not only that credit is not allocated by the price system. It is possible to create credit seemingly out of thin air. And by the same token, credit can disappear: a confidence crisis can suddenly lead to the shrinking of credit. Thus, the magnitude of credit outstanding may not be easily predictable...”

In some cases, the NKs consider credit as a substitute of cash in its function as a means of payment; Greenwald and Stiglitz (1991) observe that there are no reasons which justify the existence of a stable relation between quantity of money and income, since it is possible to make spending decisions by using credit.³³ In this case, the NKs consider credit as a monetary variable and not, as the neo-classical theory holds, as a real variable.

Finally, we note that in Keynes's approach an important difference emerges between the credit market and Akerlof's used-car market. In the latter case, we can think that the quantity of cars is independent of the choices of the intermediaries who specialise in evaluating the quality of cars (the merchants). However, in the credit market, the amount of credit depends on the decisions of the financial institutions.

3.2 The role of the banks in the presence of uncertainty

The presence of uncertainty constitutes an important element on which to build a Keynesian theory of credit and financial institutions, as it provides a sounder basis for explaining the role of banks than asymmetric information does. Keynes points out that the need to act has led us to develop a strategy which allows us to take decisions even when we don't know anything about the future results of our actions. He notes, for example, that in conditions of uncertainty, individuals think that other people are more informed and so they take their own decisions on the basis of the predominant opinion.³⁴

Following this approach, it can be said that the banks that finance firms by creating new money are the institutions which, in a world of uncertainty, are given the responsibility of deciding which investment projects can be carried out by firms. The presence of such project-screening institutions "save our faces as rational, economic men". Not even the banks, of course, possess instruments which allow them to know the 'true' probability distribution of future investments returns; they select the applications for credit on the basis of subjective criteria, based on a conventional judgement.

There are two aspects of the banks' action in the presence of uncertainty which are worth highlighting. To introduce the first one, it is a good idea to recall that Keynes believed that the conventional judgements necessary to take decisions in conditions of uncertainty are subject to sudden changes.³⁵ It can thus be assumed that also the

³³ This reasoning is linked to the definition of liquidity introduced by the Radcliffe Report and used by Kaldor in his critique of monetarism. On this point see: Bertocco 2001.

³⁴ "Knowing that our own individual judgment is worthless, we endeavour to fall back on the judgment of the rest of the world which is perhaps better informed. That is, we endeavour to conform with the behaviour of the majority on the average. The psychology of a society of individuals each of whom is endeavouring to copy the others leads to what we may strictly term a *conventional* judgement." Keynes 1937, p. 114.

³⁵ "Now a practical theory of the future based on these ... principles has certain marked characteristics. In particular, being based on so flimsy a foundation, it is subject to sudden and violent changes. The practice of calmness and immobility, of certainty and security, suddenly breaks down. New fears and

evaluation criteria applied by the banks can change rapidly, provoking deep instability in the economic system. Minsky explains that the alternation of phases of boom and bust is due to changes in the banks' criteria in appraising firms' investment projects. The application of permissive criteria drives the boom phase, encouraging firms to increase their borrowing and, consequently, their debt repayment commitments; this creates the conditions for a crisis caused by events that prevent firms from honouring their repayment obligations.³⁶

The second aspect worth noting is that, in the presence of uncertainty, banks can choose to ration credit despite the fact that they are able to create credit endogenously.³⁷ Reasoning within the NKs' approach, the two concepts of credit rationing and credit supply endogeneity appear to be contradictory. Indeed, we must remember that, according to Stiglitz, the rationing equilibrium depends not only on the presence of asymmetric information, but also on the characteristics of the credit supply function. We must assume that the credit supply is constrained by the availability of monetary base, or else that it is an increasing function of the banks' expected rate of return. If the credit supply function was perfectly elastic at the interest rate that maximises the banks' expected profits, there would be no rationing equilibrium. In the presence of uncertainty the situation is different; it would be possible to have a credit rationing even if the banks were able to satisfy all the credit demand corresponding to any interest rate level. Let us assume that banks set the interest rate by applying a mark-up at a benchmark rate which could be the bond rate or an interest rate controlled directly by the monetary authorities; in this case, rationing can occur even when banks have the same information as firms. In conditions of uncertainty, credit rationing arises due to the fact that firms and banks may formulate different expectations regarding the future results of the same investment project even when the same information is available to them; the bank might be less optimistic about the project's future returns, or it could be more risk averse. As Tobin (1980, p.10) states:

“Typically (debtors) indebtedness is rationed by lenders, not just because of market imperfection but because the borrower has greater optimism about his own prospects and the value of his collateral, or greater willingness to assume risk and to die insolvent, than the lender regards as objectively and prudently justified.”

This rationing phenomenon has different characteristics from the one described by the NKs; Stiglitz, in fact, points out that, at the rationing equilibrium, the demand for credit from firms which are - from the banks' standpoint - identical to firms which do obtain financing, is not satisfied. However, in the presence of uncertainty, the banks refuse to finance firms which they consider different from the others, in other words, firms which they do not deem to be credit worthy.³⁸

Thus, we can say that, in a Keynesian framework, the role of the banks is defined by the combination of two functions: in the first place, banks are institutions which, in conditions of uncertainty, assume the responsibility of choosing the investments which should be made; secondly, the banks grant credit by creating new money. As we have

hopes will, without warning, take charge of human conduct. The forces of disillusion may suddenly impose a new conventional basis of valuation .” Keynes, 1937, pp. 114-5.

³⁶ See : H.Minsky 1975.

³⁷ See: Lavoie 1992; Dow 1992; Wolfson 1996.

³⁸ See: Wolfson 1996.

mentioned, the NKs maintain that there is no reason to expect a stable relationship between quantity of money and income, since the spending decisions can be financed through credit. It is paradoxical that after having maintained that credit can substitute money, the NKs do not highlight the monetary role of banks, that is, their ability to offer credit by creating new money; as a matter of fact, they claim that the unique feature of banks is the nature of their assets rather than their liabilities. Such lack of interest in the monetary function of banks is probably due to the conviction that, in the last analysis, the credit supply depends on savings decisions. In contrast, the significance attributed to the monetary function highlights the fact that the credit supply does not imply a saving decision, and that the presence of savers is not a prerequisite for the existence of a credit relation; this relation regards first and foremost banks and debtors.

Finally, it must be mentioned that while, on the one hand, the NKs' comments about the working of the credit market and the role of the banks appear to be somewhat at odds with Keynes's views, on the other hand, we can find some statements which are coherent with the approach of Keynes and the post-Keynesians. Greenwald and Stiglitz seem on certain occasions to accept the argument that it is impossible to objectively represent the future results of economic decisions.:

“Capitalist economies are complicated...Decisions of individuals and firms today are based on future expectations, and are affected by past decisions. Individuals do not have perfect foresight or rational expectations concerning the future. The events that they confront often appear to be unique, and there is no way that they can form a statistical model predicting the probability distribution of outcomes. And there is little evidence that they even attempt to do so. At the same time, individuals are not myopic. They do not assume that the future is like the present.”³⁹

Moreover, they acknowledge that the activity of screening credit-seeking firms does not by any means imply that the banks have less information than firms. Stiglitz, Weiss (1990, p. 96) note that banks can refuse credit to the firms which promise to pay the highest interest rate because:

“... there may be systematic reasons for suspecting that those who are willing to offer to pay the highest interest rate are not among the best credit risks... among those who are most likely to bid high interest rates are risk lovers (who are willing to undertake very risky projects, with a small probability of success, but high returns if successful); optimists (who overestimate the probability of projects succeeding and the return if successful); and crooks (who, because they do not plan to pay back the money anyway, are virtually indifferent to the interest rate which they ‘promise’).”

If the banks' key function is to screen firms, then it must be concluded that their presence is not justified by the fact that the potential creditors do not have the same information as the debtors, but rather by the need to have an institution charged with the task of evaluating investment projects with valid criteria in the interest of society as a whole. This role is important in a world in which those who seek credit are not able to evaluate the characteristics of their own project in a socially significant way. Jaffee and Stiglitz (1990, pp.873-4) illustrates this concept by using the example of the selection criteria adopted by American universities:

³⁹ B.Greenwald, J.Stiglitz 1987, p. 131. See also: Jaffee and Stiglitz 1990; Stiglitz 2000.

“Some might find it appealing for American universities to auction the space in each incoming class to the highest bidders. After all, the individuals are presumably well informed concerning their own abilities - they *know* how hard they had to work to obtain the A- and might be the best judges of the expected value added of, say, a Harvard education. ... However, none of the major private universities uses an auction system. Presumably it is *not* believed that individuals are good judges of their own ability.... Similar arguments hold for credit markets, with particular force in changing environments... credit is used when there is a discrepancy between the availability of current resources and judgments concerning the returns on potential uses of resources. But are individuals judgments to be trusted? ... willingness to borrow (at any interest rate) may be affected as much by borrowers’ optimism concerning future interest rate, prices, and wages as it is by the ‘real’ characteristics of the project. The price system would work no better in allocating capital resources than it would in allocating scarce places in our major private universities.”

Hence the conclusion that banks should not screen the investment projects on the basis of debtors' income, but on the basis of their judgements regarding the quality of the project.⁴⁰

We can conclude this section by underlining another important difference between Akerlof's used-car market and the credit market; in the previous section it was observed that, unlike the situation in the used-car market, in the credit market, intermediaries can influence the quantity of credit offered. Furthermore, in the credit market intermediaries also influence the quality of the credit, as in the presence of uncertainty the banks evaluate loan applications by adopting subjective criteria. Therefore, by their choices, they attribute to the investment projects a certain level of quality.

3.3 Credit and development of the economic system.

The third element which should set a Keynesian theory apart is the emphasis on the role of credit in the process of change in the economic system. The presence of uncertainty characterises a world in which the past and present are not indicators of the future outcome of investment decisions. Investment decisions are unique decisions, capable of influencing the evolution of the economic system, so by selecting the investments to be made, the banks influence the process of change in the economic system. This point is forcefully underlined by Kaldor who, in his exposition of his money supply endogeneity theory, highlights the role of banks in the growth of economic systems.⁴¹

⁴⁰“The bank does not want to select among alternative borrowers on the basis of their projections of future interest rates: it wishes to discriminate on the basis of the quality of the projects” Jaffee, Stiglitz 1990 p. 874.

⁴¹“.. the most important difference between the ‘monetarist’ and the ‘anti-monetarist’ ... is the question whether the prevalence of credit money ... is a favourable factor in the functioning of capitalist market economies or the opposite. Adam Smith ... emphasized, in his chapter of Money in Book II of the *Wealth of Nations*, the favourable effects caused by the opening of banks on the general prosperity of particular regions. He cited the examples of numerous Scottish towns.... In Keynesian terms, Smith meant that the elasticity of bank credit made it possible to increase the volume of productive investment and thereby generate the additional savings necessary to finance the investment.” Kaldor and Trevethick 1981, p. 8.

Kaldor criticises the neo-classic approach because of the fact that it focuses on the allocative function of the market, without mentioning the factors which influence the process of change in economic systems. Moreover, he highlights the role of banks in the development of the economic system, stimulated by the presence of increasing returns:⁴²

“... the process of endogenous self-sustained growth requires... above all, a monetary and banking system that enables capital investment to increase in response to inducements, so as to generate the savings required to finance additional investment out of *addition* to production and incomes. This is the real significance of the invention of paper money and of credit creation through the banking system. It provided the pre-condition of self-sustained growth. With a purely metallic currency, where the supply of money is given irrespective of the demand for credit, the ability of the system to expand in response to profit opportunities is far more narrowly confined.”⁴³

The third element of this theoretical framework therefore is the focus on the relation between the credit market, financial institutions' decisions and the process of economic growth. The analysis of this relation must be carried out by abandoning the idea that the action of the financial institutions allows the real world to obtain the results possible in an ideal world with perfect information and perfectly competitive markets.

3.4 Some open issues

In concluding this paper, I mention three issues which must be tackled in order to develop a meaningful Keynesian theory of credit and financial institutions. The first one is the analysis of how the credit market and the financial institutions function within a model which considers both flows and stock. The NKs' analysis and the critical observations mentioned in the previous pages are developed in terms of flows: the demand for credit is used to finance investment decisions, and the credit supply coincides with the flow of new money created by the banks. The theory elaborated by Tobin in the course of the 1960s is, in contrast, an example of an analysis on how the credit market functions, elaborated by considering stock variables; the credit demand is expressed by operators who wish to acquire a stock of existing capital goods which is greater than the amount of their wealth. I think it is appropriate to describe the role of credit and of the financial institutions within a model which takes account both of the stock variables and of the flows, for two reasons: i) in the first place, the operators can request credit to buy not only new capital goods but also existing capital goods; ii) secondly, it must be remembered that the credit demand can be met through the creation of new money or through the use of existing money. Hence, to specify this second source of credit supply it is necessary to consider the stock variables.

The second issue to be addressed is the analysis of the role of the non-bank intermediaries. The NKs tend to identify the financial intermediaries with the banks, they are not concerned with explaining if the banks carry out a special role with respect

⁴² See Kaldor 1985.

⁴³ Kaldor 1972, p. 1250.

to other financial intermediaries; in this paper an analogous framework has been adopted. This analysis is not complete: it is necessary to clarify whether banks have particular characteristics which differentiate them from other intermediaries. We must ask ourselves if the fact that banks can grant credit by creating bank money gives them an advantage over other intermediaries. To answer this question it must be remembered that investment projects can be financed with newly created money or with circulating money. Consequently, if a significant stock of money existed which wealth-owners were willing to exchange for credit instruments issued at a suitable rate, it could be concluded that, in investment financing, the non-bank financial intermediaries which collect liquidity by placing securities carry out an analogous role to that of the banks.

The last issue regards the temporal dimension of the credit contract. Given that the contract envisages the exchange of money today against the promise of a certain amount being available at a given future date, the analysis of the credit phenomenon cannot be exhausted by stating demand and supply functions. It becomes important to state the factors which influence the firms' ability to honour their loan repayment obligations. The analysis of this point provides support for an important thesis which Keynes advanced, and which was taken up by the NKs, namely, that price flexibility does not automatically enable the full employment equilibrium to be reached. As a matter of fact, in the presence of debt contracts and of firms' repayment obligations fixed in nominal terms, price flexibility can have destabilising effects.⁴⁴ The specification of the factors which influence the ability of firms to repay loans is an important element of the theory of credit and financial institutions. Schumpeter held that, by financing the entrepreneur-innovator by means of the creation of bank money, the banks express the social consensus towards the project which the firms intend to finance. Hence, they attribute to the entrepreneur the control of a part of the resources to realise innovations whose effect will have repercussions on all of society. Following this approach, we can state that the social consensus which is expressed when an investment project is financed is partial; the substantial consensus towards these projects will be expressed by society as a whole, by creating the conditions which allow firms to repay the loans. It therefore becomes important to state which conditions allow the firms to repay the loans. This is one of the central themes of Minsky's analysis.⁴⁵

Conclusions

The basic merit of the NKs' approach is the importance it gives to the credit market and the issue of the financing of spending decisions. In the first part of this paper, some elements of weakness in the NKs' approach have been identified, and they can be listed as follows:

i) according to the NKs, the importance of the credit market and of the financial institutions is linked to the presence of asymmetric information; in a world of perfect information the savers directly finance the firms' investment projects and the financial institutions do not have any role. For the NKs, it is a fundamental point that the intermediaries, who have the function of gathering information in order to screen the loan applicants, are not able to fully carry out this function; if they were, a situation of

⁴⁴ See for example: Minsky 1980, pp. 29-30.

⁴⁵ Minsky 1984.

perfect information would be re-created, in which the neo-classical credit theory would hold. Two criticisms of this approach have been advanced. In the first place, it has been observed that the conclusions of Allen and Santomero that the IT revolution has substantially reduced the information costs seem well-founded, if you assume that there is information which allows the future results of investment projects to be defined by means of a probability distribution. Secondly, we have seen that there is no sound basis for the NKs claims that, in a world in which banks and firms have the same information at their disposal, the neo-classical theory of credit should apply;

ii) in their study of the credit market, the NKs highlight the temporal dimension of economic decisions. It has been shown that, on this point, the NKs' arguments are at odds with those of Keynes, who held that economic decisions are taken in conditions of uncertainty;

iii) finally, a contradiction in the approach of the NKs has been pointed out. To respond to some criticisms at the first demonstration of the possible existence of a credit rationing equilibrium, the NKs assumed that the banks do not know either the expected return, or the investment project risk; in this model the banks are not able to collect any more information than the potential creditors, so it is unclear why creditors and debtors do not finance each other directly, thereby avoiding intermediation costs.

On the basis of this critical analysis of the NKs' approach, the elements which should distinguish a Keynesian theory of credit and financial institutions have been identified:

a) in the first place, this theory should be based on the definition of the credit market contained in Keynes's response to Ohlin's criticism; Keynes conceives of this market as a place in which purchasing power is put at the disposal of firms in order to carry out investments. In this market are not transferred the resources which are generated by savings decisions, but rather newly created or already existing means of payment; Keynes attributes a fundamental role to the banks, which finance the firms by creating new means of payment. Following Keynes's suggestions, it is necessary to build a theory of credit that goes beyond the logic of exchange found in the neo-classical theory according to which in the credit market the creditors transfer resources saved to the debtors. On the contrary, in a Keynesian framework, the credit supply is determined by the financial institutions and is independent of the savings decisions; the credit relationship regards the banks and the debtors, while the accumulation of financial instruments by the savers is a result of the provision of credit by the banks;

b) the second element which should feature in a Keynesian theory of credit is a certain emphasis on the presence of uncertainty which allows important aspects of bank action to be demonstrated. In a world without objective criteria to represent the future results of economic decision, the banks are the institution given the responsibility to decide which investment projects can be made by firms. Banks do not necessarily act in conditions of less information than the debtors, but they screen the loan applications by adopting subjective evaluation criteria which are accepted by society at large. Two important aspects of the banks' action have been highlighted. Firstly, it has been observed that the banks' decisions condition the development of the economic system. In other words, they influence the structural changes which characterise a world with uncertainty, in which investment decisions are unique decisions, and the past and present do not constitute a reliable guide to project the future results of economic decisions. Moreover, it has been observed that the evolution of the economic system can be characterised by a significant degree of instability provoked by bank behaviour;

the alteration of conventional criteria used by the banks to evaluate the firms' investment projects can generate alternating periods of boom and bust, as has been shown by Minsky. The second significant aspect of bank action in conditions of uncertainty is the possibility of a credit rationing equilibrium occurring. This result is not due to the presence of asymmetric information but rather to the discrepancy between the evaluation criteria employed by the banks and that used by firms

In the final few pages, three issues which must be addressed in order to elaborate a complete Keynesian theory of credit were identified:

i) first, this theory should integrate the analysis of the stock and flows as the investment decisions can also be financed by using existing money. Moreover, the credit can be used not only to finance the acquisition of investment goods, but also the acquisition of existing capital goods;

ii) the second problem to be addressed regards the uniqueness of the banks with respect to the other intermediaries. This means verifying whether, in a world with high financial stock variables, the banks' ability to finance investments through the creation of new money gives them an important advantage compared to other intermediaries;

iii) the third question that must be dealt with is closely connected to the temporal aspect of the credit contract. Reference has been made to the concept of social consensus used by Schumpeter in order to highlight the responsibility vested in the banks, whose investment decisions condition the evolution of the economic system. In order to complete this analysis, it is important to study the factors which determine firms' ability to meet the loan repayment obligations. This entails explaining if the firms' ability to repay the loan can be interpreted as a sign of society's approval of the financing decisions made by banks.

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