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THE POST KEYNESIAN THEORY OF BANKING AND THE ENDOGENOUS MONEY SUPPLY

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Abstract:

This paper seeks to contribute by presenting an assessment of the relevant literature on *banking* and the *endogenous money supply*. The focus is placed on the Post Keynesian perspective, though traditional approaches are briefly discussed as well. The paper argues that, due to scope economies, banks are mistakenly confused with financial intermediaries; a common finding in the traditional literature. This is not the case of both the Post Keynesian view and the Circuit approach. Those perspectives, on the contrary, by reversing the causal link implied by the quantity theory of money, the base-multiplier and the saving-investment cycle as well as by focusing on a flow-perspective of money and on the asset side of banks' balance sheets, are both able to explain the core of the banking business and, hence, the very nature of the endogenous money supply. The paper shares the view of Screpanti (1997) for whom "*...Banks make the generic credit risk saleable*". They transform risky, illiquid, nonmarketable assets based on personal credit into safe, liquid, and marketable bank deposits which are socially perceived as money. The paper considers as well the major divergence among the Post Keynesian Horizontalist approach and the Post Keynesian Structuralist or Partial Accommodation approach; namely the exogeneity of the interest rate. Here, as in Screpanti (1997) and Wray (2004), such a divergence is assessed rather as the result of an imprecision in the definition of time horizons, or as a misinterpretation of the impact of cyclically increasing risk upon the determination of mark-ups and bank rates.

Keywords: Endogenous money supply, horizontalist, structuralist, generic and specific risks.

1. INTRODUCTION

As it is well known from the literature, there is no room neither for money nor banks in General or Partial Equilibrium models and approaches based on the walrasian and Arrow-Debreu worlds. Orthodox models concerned with the study of money require *ad-hoc* assumptions in order to justify its exogenous presence, and hence, involve the acceptance of the direction of causality implied by the quantity theory of money.

Similarly, the explanation for the existence of banks has commonly been misguidedly linked to the justification for the presence of financial intermediaries, namely the persistence of *private* informational transaction costs. While financial intermediation may well be explained by the alleviation of informational

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asymmetries-*specific risks* not taken care of by the market mechanism, endogenous money and banking can only be explained by the reduction of the *generic risk* involved in the monetisation of personal credit.

This paper contributes by providing a review of the most relevant literature regarding banking and endogenous money. Due to the vast extent of the space involved, topics such as credit rationing, the lender-borrower relationship, optimal contracting, bank risks and regulation are not considered. Thus, Section 2 starts by explaining the redundancy of money and banks in General and Partial Equilibrium frameworks based on the walrasian and Arrow-Debreu worlds. Section 3 deals with the traditional approach to the existence of banks and financial institutions which, as previously argued, is unable to disentangle the core of the banking business from that of financial intermediation, and hence, cannot explain the endogenous money supply.

Section 4 is concerned with the study of credit specific risks and generic credit risk. It reflects a Post Keynesian view on banks and endogenous money which is mainly based on the transformation of personal credit (e.g. loans) into endogenous bank money (e.g. deposits). Section 5 is concerned with the Post Keynesian perspective on uncertainty, liquidity, and precautionary behaviour.

Section 6 studies the most relevant literature on the Post Keynesian and Circuit approaches to endogenous money and banking. It attempts to identify the major differences among the Post Keynesian Horizontalist approach and the Post Keynesian Structuralist or Partial Accommodation approach. In doing so, it aims at reconciling both perspectives in order to rescue the main message of the Post Keynesian view on money. Section 7 provides an extensive summary of the most relevant aspects considered in all previous sections. Finally, Section 8 identifies potential areas for further research.

2. GENERAL EQUILIBRIUM, MONEY AND FINANCIAL INSTITUTIONS

The most serious challenge that the existence of money poses to the theorist is this: the best developed model of the economy cannot find room for it (Hahn, 1981: 1).

After citing the above paragraph from Hahn (1981), Davidson (1988) argues that, it is precisely the axiom of the absence of money illusion which yields money as irrelevant in orthodox theory. For the author, it is unsurprising the fact that there is «no room» for money in a theory in which "money does not matter". Moreover, he argues that the assumption of the absence of money illusion may better be labelled «the axiom of reals». As Hahn (1981) presents it, it can be summarised as:

> the objectives of agents that determine their actions and plans do not depend on any nominal magnitudes. Agents care only about «real» things, such as goods (properly dated and distinguished by states of nature), leisure and effort. We know this as the axiom of the absence of money illusion, which it seems impossible to abandon in any sensible analysis (Hahn, 1981: 34).

In addition to the well known result that money has no role in orthodox theory, it is for the same reason true as well that in the Arrow-Debreu economy there is no role for financial firms either. It is only in the presence of market frictions and imperfections that financial institutions come into the scene. Indeed, as it is well known from the literature, Freixas and Rochet (1997) argue that in the presence of perfect and complete markets, and under competitive equilibrium, banks, besides making zero profits, cause no effect upon other economic agents.

Thus, being the price vector the device that coordinates actions among individuals who act independently, all that is necessary to know at the time of commitment are the relevant prices associated to the securities or contingent claims under every (future) possible state of nature. This is only possible under unbounded rationality, perfect information, observability and verifiability of all possible states. Thus, as Freixas and Rochet (1997) indicate, under market completeness and under access to perfect frictionless markets, full diversification and optimal risk sharing, the Arrow-Debreu economy leads to a framework in which banks and financial institutions are simply redundant[1].

3. ON THE TRADITIONAL APPROACH TO THE EXISTENCE OF BANKS AND FINANCIAL INSTITUTIONS

3.1 The Industrial Organisation approach to Banking

As Freixas and Rochet (1997) indicate under the Industrial Organisation approach to banking, banks are defined as *financial intermediaries* whose presence merely depends on the existence of frictions in transaction technologies (e.g. the possibility to save on transportation costs). In the simplest

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[1] Mata's (2006) heterodox approach represents an interesting exception. He proposes a non-walrasian general equilibrium framework with two phases of adjustment occurring at different speeds; in his own terminology, a *Financial Pre-adjustment Theory*. While financial (or "stocks") markets pre-adjust instantaneously through prices and quantities, real (or "flows") markets, namely the goods market and the labour market, adjust ex-post mainly through changes in quantities. Banks and money are explicit and play crucial role.

setting banks buy *loan securities*, and sell *deposit securities* under given banking technologies. Thus, the analysis centres upon the determination of equilibrium under different assumptions about the type of competition.

In the case of competitive equilibrium, banks take all prices as given, including the interest rate on loans (r_L), deposits (r_D), and the interbank market (r). Profits after management costs are defined as:

$$\pi = r_L L + r\, M - r_D D - C(D,L) \qquad (1)$$

$$M = (1-\alpha) D - L \qquad (2)$$

where M is the net position of the bank within the interbank market, and α represents the level of compulsory reserves as a proportion of deposits. Thus, (1) can be rewritten as:

$$\pi(D,L) = (r_L - r)L + (r(1-\alpha) - r_D)D - C(D,L) \qquad (1)$$

After management costs are covered, banks' profits result from the intermediation margins on both loans and deposits. As Freixas and Rochet (1997) indicate in this setting a competitive bank controls its volume of loans and deposits so as to equalize both intermediation margins $(r_L - r)$ and $(r(1-\alpha) - r_D)$ to its marginal management costs.

Thus, an increase in the rate of deposits (r_D) will necessarily involve a decrease in the bank's demand for deposits. Equivalently, an increase in (r_L) will imply an increase in the bank's supply of loans. Economies of scope arise in the joint production of loans and deposits whenever $\partial^2 C(D,L)/\partial L \partial D \prec 0$, and contrarily, diseconomies of scale are present where $\partial^2 C(D,L)/\partial L \partial D \succ 0$.

In this simple framework, in which self-financing and direct access to capital markets are not considered, the investment demand of firms is entirely financed by the supply of loans. Furthermore, under the assumption that Treasury Bills (B) and bank deposits are perfect substitutes for households, the competitive equilibrium of the banking sector is easily described at the aggregate level whenever:

$$I(r_L) = \sum_{n=1}^{N} L^n(r_L, r_D, r) \qquad \text{Equilibrium of the loans market (3)}$$

$$S(r_D) = B + \sum_{n=1}^{N} D^n(r_L, r_D, r)$$ Equilibrium of the savings market (4)

$$\sum_{n=1}^{N} L^n(r_L, r_D, r) = (1-\alpha)\sum_{n=1}^{N} D^n(r_L, r_D, r)$$ Equilibrium of the interbank market (5)

As Freixas and Rochet (1997) indicate, in this simple setting, an increase in the supply of Treasury Bills (B) involves a decrease in both loans and deposits; and an increase in the compulsory deposit reserve ratio (α) leads to a reduction of credit loans and to an ambiguous effect upon deposits.

Regarding, the case of imperfect competition, which could be considered to be more appropriate to the study of the banking sector due to the well-known barriers to entry, the Monti-Klein model of monopolistic competition is, perhaps, the best representative of the Industrial Organisation approach to banking.

Such a model assumes a monopolistic bank facing a downward sloping demand curve for loans, and an upward sloping supply curve of deposits. The level of equity in the model is taken as given so that the control variables for the bank are, as earlier, both, the volume of loans and deposits. The main difference with respect to the case of perfect competition is that under monopolistic competition, banks take into consideration the effects of the volume of loans and deposits upon the determination of their corresponding rates, while the interbank interest rate remains as given perhaps due to the fact that it might be fixed by the central bank or the international market.

In this setting, profits after management costs are defined as:

$$\pi(D, L) = (r_L(L) - r)L + (r(1-\alpha) - r_D(D))D - C(D, L)$$ (6)

And optimality implies:

$$\frac{r_L^* - (r + C_L')}{r_L^*} = \frac{1}{\varepsilon_L(r_L^*)} \qquad \frac{r(1-\alpha) - C_D' - r_D^*}{r_D^*} = \frac{1}{\varepsilon_D(r_D^*)}$$ (7)

As Freixas and Rochet (1997) argue, in the above framework, a monopolistic bank sets its quantities of loans and deposits so as to equalize the so-called Lerner indices (the ratio of the marginal benefit to price) to the inverse elasticities. The evident implication from the above result is that the introduction

of substitutes to banking loans (e.g. corporate firms' securities) and to banking deposits (e.g. money market funds) have an adverse immediate impact upon the bank's intermediation margins.

The extension of the Monti-Klein model to the case of oligopolistic competition is straightforward. Oligopolistic competition in this framework leads to a Cournot-type imperfect competition setting, in which N banks participate in the market. The profit of bank n is hence given by:

$$\pi(D_n, L_n) = \left\{ \left(r_L\left(L_n + \sum_{m \neq n} L_m^* \right) - r \right) L_n + \left(r(1-\alpha) - r_D\left(D_n + \sum_{m \neq n} D_m^* \right) \right) D_n - C(D_n, L_n) \right\} \quad (8)$$

Optimality implies an N-tuple of vectors $\left\{ D_n^*, L_n^* \right\}_{n=1,\ldots,N}$ such that (8) is maximised:

$$\frac{r_L^* - (r + \gamma_L)}{r_L^*} = \frac{1}{N\varepsilon_L(r_L^*)} \qquad \frac{r(1-\alpha) - \gamma_D - r_D^*}{r_D^*} = \frac{1}{N\varepsilon_D(r_D^*)} \quad (9)$$

if costs are assumed to be linear, then it is the case that[2] $C(D_n, L_n) = \gamma_D D_n + \gamma_L L_n$.

Perhaps a more realistic approach to imperfect competition would be that of Bertrand Competition, or more precisely, Double Bertrand Competition since it takes place simultaneously in both the loans and the deposits market. In such a case banks (or financial intermediaries, in this setting) make use of rates as their strategic instruments. However, as Freixas and Rochet (1997) indicate, two major shortcomings arise from competition à la Bertrand: (i) there is no guarantee of the existence of equilibrium, and (ii) the presence of two firms –in this case banks or financial intermediaries– immediately leads to perfect competition[3,4].

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[2] Note that two limiting cases of interest arise; when $N \to 1$ monopoly, and when $N \to \infty$ perfect competition.

[3] Note that Bertrand-Edgeworth competition analysis which takes into consideration capacity constraints certainly cannot be easily justified in the case of the banking sector.

[4] Stahl (1988) and Yanelle (1989) study the case of Double Bertrand competition interestingly leading to outcomes different from the walrasian equilibrium.

3.2 The Incomplete Information Paradigm

While reviewing the Industrial Organisation approach to banking which innocently treated banks as financial intermediaries (or security retailers), it was made evident that economies of scope may arise from the opportunity to save on transactions costs such as transportation costs[5]. Even though from the historical point of view, it is accepted those types of transaction costs have significantly contributed to the emergence of financial intermediaries, Freixas and Rochet (1997) argue that a major shortcoming of the previous analysis arises from its reliance upon the exogeneity of transaction technologies.

Clearly, if one takes into account the progress in telecommunications and information based technologies, as well as the resulting advance in sophisticated financial instruments aimed at reducing costs of transactions, one should expect financial intermediaries to disappear. Thus, a different type of transaction cost must be considered in order to explain the persistence of banks and financial intermediaries; those are informational asymmetry costs.

Freixas and Rochet (1997) claim as well that, the Industrial Organisation approach to banking fails to capture the complexity of banking activities precisely because of two major reasons: (i) banks' financial contracts both, loans and deposits, cannot be easily retailed or marketed[6] mainly due to the fact that the identity of the bank (or holder) matters–non-anonymity[7]; and (ii) the terms and characteristics of the contracts issued by debtors (or borrowers) are typically different from those required and desired by depositors (or creditors).

The original contribution of Gurley and Shaw (1960) as well as the subsequent works by Benston and Smith (1976), and Fama (1980), deal with the previously mentioned complexity. However, *it is important to note once again*, that their views generally apply not only to banks but as well to financial intermediaries such as mutual funds and insurance companies[8].

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[5] Further examples such as the advantageous simultaneous supply of safekeeping and deposit services for coins and metals, and of international trading and payment services clearly add significant historical explanatory value.

[6] Recall once again that the Industrial Organisation approach to banking views banks merely as security retailers.

[7] The securitisation of bank assets brings about doubts on the veracity of such a statement. However, it is still true that securitisation is strongly limited by asymmetric information.

[8] The patient and careful reader must have noted that no major difference has yet been identified between banks and financial intermediaries. Sections 4 and 6 will attempt to

Precisely, the previously mentioned contributions view the core of banking, mutual funding and insurance provision, as a transformation of financial contracts in a way that allows for greater risk sharing and diversification[9].

Following the above setting, financial intermediaries are conceived as coalitions of individual creditors or borrowers who take advantage of economies of scope and economies of scale arising from transaction technologies[10]. Precisely, regarding economies of scale, a major contribution is Diamond and Dybvig's (1983) work on liquidity insurance[11]. They show that by the law of large numbers, a great coalition of individuals is able of investing in illiquid but more profitable assets, while simultaneously retaining sufficient liquidity to satisfy individual requirements.

In the above framework, Diamond and Dybvig's (1983) result formally implies that the market allocation is not Pareto optimal, and therefore can be improved by introducing a deposit contract issued by financial intermediaries. The justification for their result relies precisely on their assumption about the independence of individual liquidity shocks affecting economic agents in an uncorrelated fashion.

Under the above mentioned assumption, complete contingent markets are absent due to two reasons: (i) the state of economy is not observable by anyone because the list of consumers receiving liquidity shocks is unknown, and (ii) the remaining non-contingent financial market (the bond market) is unable to provide sufficient risk-sharing by itself.

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provide clarification on what are perhaps two of the most critical notions on the topic. The apparently simple distinction between specific and generic credit risk; and between short-term credit money (initial finance) and long-term securities (final finance) will be presented as fundamental for both, understanding the core of the banking business, and comprehending the very notion of money; certainly, something not clearly achieved neither by all academics nor even by all bankers.

[9] As previously argued, in an Arrow-Debreu world, frictionless and complete markets would suffice to obtain perfect diversification and optimal risk-sharing.

[10] Economies of scale arise in the presence of fixed transaction costs, or simply under increasing returns to the transaction technology. Under fixed transaction costs, the formation of coalitions allows redistributing the fixed cost among numerous depositors or borrowers. Equivalently, the presence of non-convexities or indivisibilities implies that the formation of coalitions may allow individuals to hold more diversified portfolios than the ones they could separately hold.

[11] Once again, the patient reader should wait until next sections for an explanation on liquidity and its association with the economy's generic risk.

Both, the previous result regarding economies of scale arising from liquidity insurance activity or from the distribution of other transaction costs across a large number of individuals belonging to a coalition, and the earlier approach which focused on economies of scope arising from savings on non-informational transaction costs are unable to grasp the characteristic peculiarities associated with banks.

The latter is true because of the initial previous reasoning. Under the Industrial Organisation approach to banking, banks are innocently considered as security retailers under an assumption of exogeneity of transaction technologies. The former is true as well because economies of scale arising from liquidity insurance activity or from the absorption of other transaction costs by a large coalition are present not only in the case of the banking sector, but as well in the case of regular insurance, and inventory management.

However, when major transaction costs arise from asymmetries of information, be them in either their ex-ante form of adverse selection, their interim form of moral hazard, or their ex-post form of costly state verification, the justification for the presence of banks and intermediaries becomes evident.

As Bhattacharya and Thakor (1993) argue, the work by Leland and Pyle (1977) may be considered as the starting point of this branch of literature. It represented a major impulse to modern financial intermediation theory since it provided a rationale for financial intermediaries which, being able to discover the quality (or mean returns) of given individual projects, become capable of selling claims to primary investors upon a diversified portfolio of their assets.

As Leland and Pyle (1977) sustain, banks may be able to communicate relevant information about borrowers in a better way and at lower costs. As Bhattacharya and Thakor (1993) indicate the previous point was crucial since "...it suggested that an information-based foundation for the banking firm could be built that subsumed both brokers and asset transformers".

In the view of Bhattacharya and Thakor (1993), financial intermediaries provide brokerage and qualitative asset transformation services. Thus, economies of scale and economies of scope arise from both services. Precisely, regarding brokerage, they argue that brokers develop special skills that allow them interpreting subtle informational signals while being able to exploit (or profit from) cross-sectional –across customers– and intertemporal reusability of information. In relation to qualitative asset transformation services, they underline

the major modifications of asset attributes such as: maturity, divisibility, liquidity and credit risk transformation[12].

Returning to the problem of information asymmetries, or what is the same, to the previously mentioned information-based foundation of the banking firm, Freixas and Rochet (1997) underline that as discussed in Akerlof's (1970) seminal paper[13], asymmetric information is relevant for the explanation of market inefficiencies. Precisely, in the case of financial markets, when individual borrowers have private information on the quality of the projects they wish to finance, the competitive equilibrium may turn to be inefficient. However, as shown by Leland and Pyle (1977), the adverse selection problem arising from asymmetric information may be partially reduced if borrowers can use retained equity as a signal to investors[14]. As firms cannot obtain perfect risk sharing, such a signal represents a cost which can be considered as an informational transaction cost.

As a reaction to the contribution of Leland and Pyle (1977), further works such as those by Diamond (1984) and Ramakrishnan and Thakor (1984) were able to prove that economies of scale may be present under certain conditions. Precisely, if firms are able to form coalitions (intermediaries) under the absence of frictions in internal communication, the cost of capital per firm becomes a decreasing function of the number of firms belonging to the coalition. In this setting, diversification reduces monitoring costs. The major distinction among these last two contributions is that, while Diamond (1984) focuses on depository financial intermediaries who provide qualitative asset transformation

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[12] In the *conventional literature*, while maturity transformation implies the financing of long-term bank assets with shorter-term liabilities, divisibility transformation implies, for instance, mutual fund holding of assets of a larger unit size than the average corresponding liabilities. Equivalently, while the *traditional literature* refers to liquidity transformation as the bank funding of illiquid loans trough liquid liabilities, it refers to credit risk transformation as bank monitoring efforts aimed at reducing default probability.

[13] The original contribution by Akerlof (1970) established the fundamentals of asymmetric information theory. Roughly speaking, his contribution has been taken to describe how the presence of quality heterogeneity and asymmetric information may lead to market inefficient outcomes, and even to the disappearance of a particular market (e.g. the used car market). When quality is ex-ante undistinguishable for a buyer due to asymmetric information, incentives exist for the seller to offer a low-quality good as if it were a high-quality one. The buyer anticipates this problem and takes into consideration the uncertainty about the quality of the good. In such a framework, only the average quality of the good is considered, implying an adverse selection problem in which higher than average quality goods are driven out of the market.

[14] This is analogue to the theory presented by Spence (1973) for the job market.

services, Ramakrishnan and Thakor (1984) concentrate on non depository financial intermediaries.

Thus, one of the pioneer works on the delegated monitoring theory of financial intermediation is that by Diamond (1984) who argues that, the presence of increasing returns to scale associated to monitoring activity implies a specialisation under which lenders delegate monitoring functions instead of undertaking them by themselves. In such a framework, in order to trust the information provided by monitors, they must be given the appropriate incentives to perform in the interest of those who delegate.

Diamond (1984) argues that whenever investors are able to impose non-pecuniary penalties on those monitors who do not perform well, the optimal deal resembles a deposit contract[15]. Furthermore, diversification of loans allows the monitor (or banker) to reduce the cost of delegation so as to approximately offer riskless deposits. Calomiris and Kahn (1991) argue that demand deposits represent the optimal banking arrangement as they are the best instruments to impose discipline upon bank managers since, whenever anything goes wrong, investors withdraw their deposits.

Holmström and Tirole's (1997) work is outstanding. It sustains that outside investors require the involvement of the monitor in the project through its participation in the financing, thereby creating the opportunity for economies of scope between monitoring and lending activities, while simultaneously emphasising the role of banking capital. Their framework smartly captures the substitutability between capital and monitoring. Without assuming complete diversification as in Diamond (1984), banking capital in Holmström and Tirole's (1997) model, deals with the moral hazard problem at the bank level[16].

Further research such as that by Hellwig (1991) refers to monitoring in an ampler sense. It may involve ex-ante screening activity in a context of adverse selection as in Broecker (1990) and prevention of the borrower's opportunistic behaviour during project implementation (moral hazard) as in Holmström and Tirole (1997). Finally, it may consider as well the case of punishing as in

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[15] Some criticism has been raised regarding Diamond's (1984) assumption of non-pecuniary penalties which were modelled in accordance to the borrower's cash flow reports. The reason is that more realistic non-pecuniary costs such as loss of reputation, jail, and so on, may better be considered as lump-sum.

[16] A major difference between Diamond's (1984) framework and that of Holmström and Tirole (1997) is that, while in latter perfect correlation among projects (financed by banks) is assumed, in the former, project returns independence is considered.

Diamond (1984), and auditing as in Townsend (1979), Gale and Hellwig (1985), and Krasa and Villamil (1992), with both punishing and auditing taking place under (costly state verification arising from) a failure of compliance with contractual obligations.

As perceived by Bhattacharya and Thakor (1993), the theory of financial intermediation based on informational asymmetries explains the existence of financial intermediaries as a response to the incapability of the market-based mechanisms to efficiently deal with informational problems. Consequently, in such a framework financial intermediaries contribute to reducing informational anomalies.

In spite of the progress of the above mentioned literature, and as pointed out by Freixas and Rochet (1997), while it is true that monitoring activities for which Diamond (1984) suggests banks may have a comparative advantage[17], and which may include all the above mentioned forms of, ex-ante screening, prevention of opportunistic behaviour, punishing and auditing, all improve the efficiency of the lender-borrower contracts, it is also true that all those monitoring activities may as well be undertaken by individual lenders themselves or by specialized firms such as rating agencies, brokers, security analysts, auditors and so on. An alternative explanation must then capture the particular complexities of banking and money; those complexities are the concern of the next sections.

4. CREDIT SPECIFIC RISK AND CREDIT GENERIC RISK: A POST KEYNESIAN VIEW ON BANKS AND MONEY

As argued by Screpanti (1993, 1997), the (*credit*) *specific risk* is that related to the *insolvency risk* of a particular debtor. In as much as such *insolvency risk* refers to the actual possibility that the debtor will not be effectively capable of repaying his debt, it should naturally constitute the objective foundation of the (*credit*) *specific risk*. However, as in practice the latter is frequently reduced to the creditors' *subjective evaluation* of the debtor's capability to repay, it is

[17] Several assumptions are crucial for such a comparative advantage. Scale economies must be present, implying that a bank must finance many projects simultaneously. Additionally, divisibility arguments, such as small capacity of investors relative to the dimensions of the investment projects, that is, each project requires the funds of several investors. Finally, low costs of delegation, implying the costs of controlling the bank itself must not exceed the gains from scale economies associated to the direct monitoring of the investment projects.

common to observe substantial divergences among the different estimations reached by diverse potential creditors.

It is precisely this divergence among different evaluations of a debtor's insolvency risk what complicates the monetisation of personal credit. Equivalently, it is such a divergence among different evaluations what reduces as well its marketability. Thus, it is exactly because of the fact that the debtor's ability to generate income is usually not fully observed because of the presence of hidden or private information on the part of the borrower (asymmetric information) that personal credit lacks moneyness, liquidity, and marketability. Particularly these are some of the conditions allowing banks to flourish.

Thus, even though banks cannot fully remove the specific credit risk associated to a particular borrower, they can greatly contribute to ameliorate informational asymmetries, and in so doing, they can reduce the discrepancies among the different evaluations of risk. Screpanti (1993) argues banks are endowed with relatively greater proficiency and technical skills for the evaluation of the debtor's business, and moreover, by establishing durable relations with their customers, they are capable of accruing a stock knowledge regarding the evolution of their cash flow capacity and wealth conditions.

Additionally, Screpanti (1997) sustains that by applying differential interest rates and collaterals, banks are able to enforce truthful revelation of borrowers' information (and type), and therefore are able to discriminate among different risks. The reason is simply that, while those borrowers with low-risk projects are interested in revealing information, those with risky projects are interested in hiding it. Furthermore, just as financial intermediaries do, banks as well can make use of diversification strategies in order to reduce the overall credit risk faced by their creditors. Thus, the overall risk bank-creditors take will always be lower than the sum of risks banks tolerate from debtors.

As previously mentioned, Freixas and Rochet (1997) have pointed out that all the above mentioned activities precisely designed in order to deal with the problems related to the presence of asymmetric information and risk diversification may as well be undertaken or at least partially undertaken by individual lenders themselves, by specialized firms such as rating agencies, brokers, security analysts, auditors and so on.

Equivalently; however, with greater emphasis, Screpanti (1993, 1997) clarifies the fact that, even though it is correct to recognise that the management of *credit specific risk* –either through the direct partial removal of informational asymmetries or through the indirect reduction of overall (credit) risk by means of diversification– represents an important part of the banking business, *it is not its*

essential part, and indeed, it can be conducted by non-bank institutions. Precisely, he sustains that: "...as far as the gathering of information on specific risks and the diversification of investments is concerned, there is still no need for banks" (Screpanti, 1997: 125).

If the management of *specific credit risk* can take place without banks, what is that so particular about banks, what is the core of their business? As Screpanti (1993, 1997) argues, after a great deal of *specific risks* are reduced either by the attenuation of informational problems, or by means of diversification, there prevails an aggregate substantial amount of risk; such a risk is the *credit generic risk.*

Generic risk refers to that risk common to all. It is independent of particular characteristics of the debtor, and therefore, mainly responds to causes which out of control to him; for instance: crises, recessions, natural disasters, social tensions, political problems, and so on.

Screpanti (1997) points out that under times of tranquillity specific risks of borrowers are regularly not strongly correlated. In as much as this is true, diversification strategies are able to allow for a major reduction of risk. However, as soon as unstable times arrive, two major factors contribute to the increase of *generic risk*: instability itself increases the level and comovement of *specific risks* (under recessions, crises, prosperity, and booms) and with it, of course, the level and variability of *generic risk*, but as well, and on top of it, instability presents itself under no specific frequency, and for this, no accurate estimation or forecast can be obtained for *generic risk.*

As Screpanti (1993) indicates, the fact that *generic risk*, on top of being high and variable, cannot be accurately estimated represents the greatest disincentive for potential creditors. In such scenery, which Davidson (1988) may typify as not coming from an "ergodic random draw" from any given and unchanging probability distribution, is where banks certainly play a role.

Indeed, as Screpanti (1993, 1997) holds, banks besides being efficiently prepared (with special abilities and technical skills) to carry out the task of managing specific risks –which as previously argued may be managed as well by financial intermediaries, brokers and others– banks are especially endowed to play a role which is not only essential but as well particular to them; "they take upon themselves the generic risk of their debtors and transform into a bank wealth [insolvency] and liquidity risk *Banks make the generic credit risk saleable*" (Screpanti, 1997: 571; italics added).

Why are creditors willing to accept much more liabilities from banks than from banks' debtors? The author sustains four fundamental instruments are used

by banks for that to happen. Those instruments which he calls risk transformation instruments are: (i) base money and quasi-money reserves; (ii) liability insurance (e.g. deposit insurance, and hedging instruments); (iii) membership into a network of relationships with other banks, allowing for the provision of mutual assistance and therefore for the socialisation of part of the risks (e.g. interbank markets, etc.); (iv) they may belong as well to a system of banks led by a central authority playing the role of lender of last resort; and (v) and most important, they bear part of the risk by investing their own capital and reserves into the business.

Clearly, as argued by the author, the major economic consequences of the use of the above set of risk transformation instruments are that: (i) banks' insolvency risks are publicly perceived as very low; (ii) and for the previous reason, the public is willing to accept bank money (liabilities); and (iii) banks are able to profit from charging relatively high rates for their risky assets while paying relative low rates for their safe liabilities.

The above is a Post Keynesian approach to banking, which interestingly enough, views the risk transformation process precisely in the opposite way conventional literature does. Thus, while it is commonly read when referring to banks that: "...Specifically, they transform deposits of convenient maturity, such as demand deposits (without any restriction on the minimal amount and with a low risk), into nonmarketed loans (with a longer maturity and in larger amounts, and with credit risk)" (Freixas and Rochet, 1997: 18), the Post Keynesian literature, instead, emphasises exactly the opposite direction, that is, it views asset (risk) transformation as a process which goes from assets (loans) to liabilities (deposits): "*The business of banks consists of transforming potential credit into money*" (Screpanti, 1993: 123; italics added).

5. UNCERTAINTY: LIQUIDITY AND PRECAUTIONARY BEHAVIOUR

5.1 On economic agents

Orthodox theory studies economic agents under methodological reductionism as it concentrates upon the study of individual behaviour. Heterodox theory, on the contrary, even while recognising the relevance of individual relatively free, rational, and self-interested choices, places a great attention upon what Screpanti (1993) labels *collective agents*.

Screpanti (1993) argues that individuals act independently only within the boundaries defined by a potentially large set of institutional and cultural elements; at least those which influence the structure of their needs, interests

and objectives. As in the Post Walrasian framework studied by Bowles (2004), Screpanti (1993) considers how endogenous institutions may shape individual behaviour by defining the set of rules to act under uncertainty

In particular, Screpanti (1993) identifies three hypotheses under which institutions are found to play a crucial role in the determination of individual behaviour under uncertainty. A first hypothesis which he labels "the criterion of institutional compliance", argues that individuals appeal to strategies of simplification (e.g. they like simple rules). In doing so, the individual pursues a reduction of the number of control variables upon which decisions must be made, either by disregarding some potential but irrelevant "excess" options, or simply by focusing his attention upon the relevant ones[18]

It is precisely because these strategies are not always necessarily either fully conscious or consistent, that institutions play a role in the selection of simple rules. Thus, as sustained by Screpanti (1993), individuals will likely follow those options which have been socially proved to work. In doing so, be it in a more or less conscious way, they will be making extensive use of the aid of institutions and socially prevalent rules of behaviour.

A second hypothesis about individual behaviour is that, once the set of choice variables has been identified, the individual will chose the option he considers best. In doing so, the individual is assumed to make use of certain evaluators (e.g. preferences, decision-making rules or any other judgement) to allow himself choose under what Screpanti (1993) labels the "criterion of conditional improvement". It is an *improvement* because the individual selects what he considers best[19]. It is *conditional* because it depends on the previously discussed constraints set by institutions and therefore upon a reduced set of options from which to choose. Finally, because of such conditionality and because of the fact that many evaluators may be used, neither maximisation nor optimality is guaranteed.

Precisely, the fact that neither maximisation nor optimality is guaranteed, and as argued by Screpanti (1993), because all choices change the data of the problem,

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[18] As the author argues, this could simply be put into mathematical terms. For instance, in a system of equations in which the unknown are the variables which represent the choices or controls of the individual, while the parameters and the functional forms of the equations assimilate the elements affecting their decisions, disregarding a variable could be captured by taking as constant or parameters those variables which under a simplifying strategy facilitate the determination of the system.

[19] Notice that, as indicated by the author, the *status quo* could be one of the possible choices.

and as many of them may be mistaken ex-post as clearly may be the case under uncertainty, it is always possible that the adaptive behaviour of individuals constrained by their own rules and institutions, could lead to a path-dependent dynamics in which optimum outcomes may turn to be repeatedly rejected.

However, as systematic errors cannot persist over time, a third criterion which gives the first two a rational substance, and which Screpanti (1993) has labelled "institutional revision", implies that the individual behaviour will remain linked to the previous criterions of institutional compliance and conditional improvement as long as no continuous worsening of his situation takes place. Thus as in Bowles (2004), Screpanti (1993) presents a framework in which endogenous evolution of institutions and preferences dominate.

The above Post Walrasian setting, when merged with the Post Keynesian view of a monetary production economy, allows for a description of the institutions of precautionary behaviour and money contracts as fundamental and evolutionary stable within modern capitalist economies. Next subsections deal with the role of money under uncertainty.

5.2 When money matters

Post Keynesian economist Paul Davidson (1988) refers to Arrow and Hahn's demonstration of the fact that in an economy functioning along a calendar time including past and future, whenever contracts are specified in money terms, all existence theorems of general equilibrium are jeopardised (Arrow and Hahn, 1971: 361). In terms of Davidson (1988) this implies that "there need never exist, in the long run or the short, any general equilibrium market clearing price vector". Davidson's (1988) quotation of Arrow and Hahn (1971) shows they have noticed that:

> ...the terms in which contracts are made matter. In particular, if money is the goods in terms of which contracts are made, then the price of goods in terms of money are of special significance [nominal magnitudes matter!]. This is not the case if we consider an economy without past and future....If a serious monetary theory comes to be written, the fact that contracts are made in terms of money will be of considerable importance. [Arrow and Hahn, 1971: 356-357, in Davidson, 1988: 153].

Keynes (1973, 13: 411) had long before argued that money was not neutral, and that, therefore, money plays a fundamental role affecting motives and decisions both in the short run and the long run. Equivalently, Davidson (1982-1983) argues that: (i) in an economy which moves through calendar time, and (ii) in a world in which uncertainty about the future cannot be reduced to an "ergodic

random draw from a given and unchanging probability distribution", and (iii) as "...production takes time", the optimal way to organise the production process is through the use of forward monetary contracts (Davidson, 1988: 152).

Moreover Davidson (1988) argues that, it is precisely the consciousness about calendar time, the uncertainty about the future, and the fact that production itself is time-consuming what creates a need for liquidity, a concept he argues: "only has meaning and relevance in a world which does not rely on the axiom of reals"[20].

Equivalently, following Davidson (1988), apart from the organisation and efficiency of production and consumption processes of non-*homo sapiens* lower life forms, the recognition of the passage of time and the uncertainty associated to a "non-ergodic" world, as well as the complexity of the interrelation between consumption and monetary processes, makes of the utilisation of monetary contracts an essential evolutionarily stable institution of human economic activity. Money as a means of payment is anything legally and legitimately able to discharge a contractual liability. Thus, legal enforcement, and the authority of law are fundamental for all parties involved in a monetary contract.

As claimed by Davidson (1988: 154-155): "Forward nominal contracts for the sale of goods and services are human institutions devised to enforce money wage and price controls over the life of the contracts". They contribute to the reduction of potential conflicts by guaranteeing both parties that even under uncertainty of future events any lack of compliance with the terms will be penalised by law. Thus, it is precisely the unpredictability of money wage and nominal price flexibility, two major characteristics of neoclassical economics, what firms and households are exactly most averse to, and therefore, what they are readily interested to contract in order to reduce.

Thus, in a monetary production economy, the presence of nominal contracts and means of money allowing for the termination of contractual obligations affect both, real production, and general decisions and motives of economic agents. Precisely, the latter are the immediate concern of the next subsection.

5.3 Precautionary behaviour, liquidity and solvency

In the view of Screpanti (1993, 1995) precautionary behaviour is linked to bounded rationality and to tolerance thresholds. Those thresholds are usually

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[20] For the concept of the "axiom of the reals", see Section 2.

defined by reservation measures. Some examples include the selection of levels of inventories of intermediate, semi-processed, and final goods; the selection of production capacity; and the choice about holdings of financial assets, quasi-money, and money. All of them operate as shock absorbers when dealing with perturbations, errors and uncertainties.

As Screpanti (1993) argues those thresholds, which are decided by individuals, tend to be collectively defined using as benchmarks distinct habits, conventions, and beliefs which are socially proved to effectively work. As previously argued those conventions are susceptible of being revised as any other institution is, but as long as they do not incur systematic worsening, they will be perceived as correct and therefore will persist.

Money is a particular asset representing an important component of the economy's wealth. Besides being unit of account for economic transactions, it is characterised by four major properties: (i) it is a reserve of value like any other asset; (ii) it is marketable like securities and quasi-money are but certainly personal credit and many other assets are not, (iii) it is liquid as quasi-money is as well; and finally and above all, (iv) it is an instrument of credit accepted as means of exchange and as means of payment.

Screpanti (1993) indicates that firms hold money balances at a rather low level, but to some extent in a fixed or stable ratio to the expected long-run flow of production. Moreover, he sustains that this minimum reservation level for money holdings is insensitive to: changes in interest rates and short-run fluctuations in output (demand).

The reason why the money reserve ratio of firms is relatively insensitive to both changes in interest rates and short-run fluctuations of output is clear-cut. At least at the aggregate level, two major factors tend to offset each other. While opportunity costs increase with the amount of money holdings and with the rate of interest on money substitutes (e.g. quasi-money), renewal costs which are associated to the monetisation of such money substitutes, increase with the number of transactions and decrease with their unit size.

Thus, while for the case of large firms the level of money holdings tend to be high, their ratios to output are regularly low; and while for the case of small firms the level of money holdings tend to be low, their ratios to output are usually high. Following the previous reasoning, one would expect however, that because of the intermediate levels of money holdings of average size firms their reserve ratios should be more sensitive to potential gains and therefore should be more reactive to changes in interest rates and short-run fluctuations of output. However, either because their share in the economy is low, or perhaps simply

because firms do not follow a maximising behaviour, it is a regular circumstance to observe that at the aggregate level, a low elasticity of money holdings to interest rates persists (Screpanti, 1993).

Equivalently, in relation to short-run fluctuations of output (demand), as inflows and outflows tend to approximately vary in the same direction during cyclical fluctuations, reservation ratios remain mostly unchanged. Moreover, a second shock absorber is always available in the form of quasi-money or short-term non-monetary holdings. These are used as well to cope with any short-term monetary requirements. Thus, as indicated by Screpanti (1993), firms' cash management activity contributes to the procyclicacity of the income velocity of money.

When referring to banks, Screpanti (1993) holds that the banking sector benefits from the existence of increasing returns to scale. Banks' profits derive mainly from the spread among credit and debit rates, and from the composition and size of their assets. In deed, hypothetically speaking, he argues that, if it not were for the presence of psychological and institutional factors, rather than technological ones, banks all together, by reducing credit rates, would be able to expand their volume of loans almost indefinitely and hence the volume of their deposits in such a way that debit rates would decrease as well. However, banks as well as corporate firms hold reserves in order to deal with illiquidity risks[21].

Indeed, banks hold primary reserves in the form of monetary base[22] but additionally, they hold secondary reserves in the form of quasi-money. Primary reserves are accepted for immediate compensation, but yield no income[23]. Secondary reserves must first be monetised if they want to be used for clearing, but they do yield an interest, though inferior to that of loans. Thus, the major difference derives from the fact that while primary reserves are monetary, liquid and marketable, and while secondary reserves are liquid and marketable but non-monetary, loans are non-monetary, non-liquid and non-marketable.

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[21] A bank's illiquidity risk mainly refers to the risk associated to the possibility that net compensations of customers' deposits among banks may lead to an extensive cash deficit for a particular bank. In dealing with this type of risk, banks are expected to manage their assets and liabilities in an efficient way. However, not even efficient management of assets and liabilities can guarantee full elimination of this risk.

[22] Usually banks' money base holdings include: cash under the bank's custody, and reserves under the custody of the central bank.

[23] The exception is the case of non-compulsory remunerated reserves under the custody of the central bank.

It is precisely the fact that loans are non-marketable what forces banks to hold secondary reserves. And, equivalently, it is in particular the fact that quasi-money cannot be used for compensation what forces banks to hold primary reserves. Thus, while the profit motive creates incentives for banks to keep their primary ratio as low as possible, the precaution motive does exactly the opposite. The reason is that under a low primary ratio, a shortage of secondary reserves would immediately force banks to look for "urgent money". This in turn, implies the risk of facing either excessively high interest costs, or simply having to deal with difficulties posed by the market or the central bank.

As sustained by Screpanti (1993) under such circumstances, the reserve ratio depends on three major factors. Firstly, it depends on the subjective or psychological preference for money. Secondly, it depends on the objective or market based rate of return on assets. And, thirdly, it depends on various institutional elements such as: the degree of organisation of the money market, and the financial and monetary policy of the central bank.

It is clear that; on the one hand both, well organised and deep money markets as well as interest rate-smoothing monetary policies contribute to the reduction of reserve ratios; on the other hand, it is evident as well that lower asset returns, and therefore, lower opportunity costs, increase reserve ratios.

What perhaps calls for greater clarification is the so-called banks' preference for money. Contrarily to the case of the public's liquidity preference which mainly concerns the choice of composition among non-monetary short-term and long-term assets in the case of creditors (e.g. households), and non-monetary short-term and long-term liabilities in the case of debtors (e.g. corporate firms), banks' preference for money regards the choice among low-risk monetary assets and high-risk non-monetary assets-e.g. risky loans whose counterpart are safe deposits (Screpanti, 1993).

Thus, while for the case of the public both households (creditors) and firms (debtors), the major concern is the maturity composition of their assets and liabilities respectively, for the case of banks, the major concern is the ratio between primary reserves and deposits. This is true because bank's liabilities mainly consist of liquid obligations (e.g. deposits, interbank loans, etc). Thus, quasi-money itself cannot suffice to provide psychological relief.

As argued by Screpanti (1993), banks are not only concerned about illiquidity. They are also concerned about the possibility of not being able to recover the whole value of their credit loans. As safeguard, banks hold equity capital and pay close attention to the evolution of their debt to assets ratio. This as well forms fundamental part of the banks' precautionary behaviour; banks'

capital is both a signal of their ability to generate profits but as well a buffer against possible losses and insolvencies. A low capital to assets ratio represents a condition of high profitability but as well of high exposure. Thus, regularly, monetary authorities are the ones who impose capital adequacy ratios. However, the effective ratio held by banks varies in accordance to their evaluation regarding customers' solvency, and therefore is highly associated to the bankers' perception regarding the overall evolution of the economy.

6. CREDIT MONEY AND ITS ENDOGENOUS SUPPLY

Rochon (2001) points out that American Post Keynesians regularly refer to the initial contributions of both Hyman Minsky and Nicholas Kaldor as the starting point of the theory of endogenous money. Thus for instance, while Wray (1992: 161) and Dymski and Pollin (1992: 41) have referred to the original works by Minsky (1957a, 1957b), Musella and Panico (1993) and Targetti (1992) have referred to Kaldor's (1958) Memorandum to the Radcliffe Committee as a major initial contribution to the theory.

However, Rochon (2001) argues that the two Cambridge economists Richard Kahn and Joan Robinson had already provided a "well-defined" theory of endogenous money by the late 1950s. Moreover, he argues that in numerous considerations their analysis is superior to the *initial contributions* by Minsky and Kaldor whose critiques of Monetarism mainly referred to the variability of the income velocity of the money stock –explained either by financial innovations in the case of Minksy or by the existence of "near moneys" in the case of Kaldor– rather than by focusing directly on the rejection of the directionality of the causality implied by the quantity theory. Previous to studying the major contributions to the theory of endogenous money, the notion of exogenous money supply is considered.

To say that the money supply is exogenous accounts to say that the central bank –in response to changes in the demand for money and by making use of open market operations, the discount rate, reserve requirements, or some other instrument– has the ability to adjust the economy's overall volume of money so as to bring it to that particular level corresponding to its policy objectives (Rousseas, 1986). This is completely refuted by all Post Keynesian economists.

As argued by Rousseas (1986) both Monetarists and "bastard" Keynesians[24] consider the money supply as exogenous. On the one hand, Monetarists

[24] Joan Robinson is responsible for coining such an expression.

disagree with the possibility to make effective use of monetary policy in order to countercyclically control the "exogenous level of the money supply". For them it is sensible to ignore short-run business fluctuations in order to play for the long-run. On the other hand, "bastard" Keynesians do allow for the presence of short-run "leakages" or fluctuations in the income velocity of money. Those fluctuations which are considered a reaction to interest rate changes undermine the effectiveness of monetary policy; the latter being assumed to affect directly the supply side.

Thus, in terms of the famous Cambridge equation ($MV = Y$) both, Monetarists and "bastard" Keynesians consider nominal income (Y) to be a function of the money supply (M); though the latter conceive such a link as unpredictable. Nevertheless, for both, the causal arrow runs from money to nominal income ($M \Rightarrow Y$). Particularly, in the case of Monetarism, as the income velocity of money is assumed to be constant in the long-run ($\bar{V}$), and as the economy is expected to naturally tend toward a unique full-employment equilibrium, then the price level itself ($P = Y / y$) is uniquely linked to the money supply in a proportionate way. Thus, from this viewpoint, a change in the money supply (M) yields no effect either on the real sector of the economy or on the interest rate since the latter is linked to marginal productivity and the former is at its full employment level.

On the other hand, Neoclassical (or "bastard") Keynesians refute both the idea of the natural tendency toward full-employment equilibrium and the stability of the income velocity of money. Thus, they argue in favour of discretionary monetary policy which, when mixed with an appropriate fiscal strategy, allows for a fine-tuning of the economy toward a full employment level of equilibrium characterised by relative price stability; Rousseas (1986) refers to this as "Samuelson's artificial restoration of Say's law through the «skilful use of fiscal and monetary policy»".

In view of the previous arguments and regardless of their disagreements, both Monetarist and "bastard" Keynesians consider the money supply as exogenously fixed by the central bank. As argued by Rousseas (1986), contrary to the original view of Keynes who denied the validity of the quantity theory of money[25] and for whom the rate of interest was a monetary phenomenon and hence a "reward for parting with liquidity", in the orthodox view, the rate of interest is regarded as the reward for abstinence.

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[25] Rousseas (1989: 477) points out, however, that Keynes in the *General Theory* had not yet fully freed himself from the quantity theory of money.

Lavoie (1992) following Keynes, holds that, in opposition to the orthodox view, savings can only stem from a previous act of expenditure. The generation of income resulting from an increase in investment leads to the generation of savings, hence savings cannot finance investment; savings are just a residual of the system that reduces aggregate demand.

Arestis (1992), Davidson (1972: 270), Lavoie (1992), Moore (1988b), and Rochon (2001) sustain that commercial banks finance the credit firms demand in order to remunerate workers and to cover other production and investment expenditures. Rochon (2001) referring explicitly to Moore (1996) and Wray (1999), argues all Post Keynesians accept that the central bank sets the rate of interest and acts as a lender of last resort.

Similarly, Pasinetti (1974: 44) argues that the base rate is "determined exogenously with respect to the income generation process. Whether, in particular, liquidity preference, or anything else determines it, is entirely immaterial". Thus, Rochon (2001) argues Post Keynesians reject the Hicksian IS-LM which treats the monetary and real sector as independent[26]. As sustained by Rochon (2001) money is not neutral both in the short and long-run; money is an effect instead of a cause; expected output drives money supply, and prices are a mark-up over costs and the desired rate of return.

In addition, Rochon (2001) argues that even though the New Keynesian approach (as in Gertler and Gilchrist, 1993) underlines the role of banks, the theory is utterly flawed in the sense that it treats banks as financial intermediaries who simply bring borrowers and lenders together. In such a framework, the money supply is not endogenous, and the central bank is able to control reserves, loans, and *"prior deposits"*. It is a reassertion of the wrong direction of causality, namely from savings to investment; banks' prior deposits are supposed to finance bank loans; "money is credit driven but supply-determined" (Rochon, 2001: 293). This is completely refuted by all Post Keynesian economists, as well as by Keynes himself.

As pointed out by Rousseas (1986) apart from one of Keynes' major works, namely the Treatise (1930) in which the disequilibrium approach is prevalent[27], and apart from the General Theory (1936) which is not at all the major reference for the case of Post Keynesian economists, Keynes' three most celebrated

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[26] Rochon (2001) argues as well that Post Keynesians reject the notion of the natural rate of interest.

[27] Rousseas (1986: 32) argues, however, that the *Treatise* was "neoclassical in its theoretical core".

articles posterior to the General Theory are: "The General Theory of Employment" (Keynes, QJE, February 1937a), the Alternative Theories of the Rate of Interest" (Keynes, EJ, June 1937b), and "The Ex-ante Theory of the Rate of Interest" (Keynes, EJ, December 1937c).

Post Keynesians often refer to the last two of the above mentioned articles since they introduce the concept of the "finance motive". As argued by Rousseas (1986), contrarily to the stocks approach predominant in Keynes' study of the demand for money balances including both the transactional component and the speculative component (idle balances), the finance motive is rather a flows approach under which the notion of time is made explicit in order to capture the idea that firms make at least some of their investment decisions ex-ante, and hence generate a "temporary demand for money before [actual investment] is carried out" (Rousseas, 1986).

Thus, the finance motive concerns a planned investment for which provision of funds must be secured before investment itself takes place. In the view of Rousseas' (1986) interpretation of Keynes, ex-ante investment plans imply an increase in the demand for ex-ante finance which (citing Keynes) "cannot be met without a rise in the rate of interest unless the banks are ready to lend more cash...at the existing rate of interest"; the latter being unlikely in the view of Rousseas' (1986), who once again, quoting Keynes, underlines that the role of banks becomes crucial in the "...transition from a lower to a higher scale of activity". Moreover, he argues that, under insufficient accommodation of ex-ante demand for finance, congestion takes place in the short-term loan market and the rhythm of investment is severely constrained. Thus, the notions of the finance motive and overdraft facilities are extremely crucial to Post Keynesian analysis. Keynes refers to both of them arguing that:

> [T]o the extent that the overdraft system is employed an unused overdrafts ignored by the banking system, there is no superimposed pressure resulting from planned activity over and above the pressure resulting from actual activity. In this event, the transition from a lower to a higher scale of activity may be accomplished with less pressure on the demand for liquidity and the rate of interest. [Keynes, in Rousseas, 1986: 37-38; italics supplied].

From above it is easy to infer that if overdraft facilities were unlimited, no major interest rate change would have to take place, and therefore the money supply would have to be considered as perfectly elastic (horizontal). This is precisely the basis on which major theoretical differences across Post Keynesian economists are found.

For Rousseas (1986: 73), a complete theory of endogenous money supply entails: (i) the denial of the notion of the natural tendency toward a long-run full-employment equilibrium, or equivalently, the acceptance of inherent instability of capitalist economies; (ii) the rejection of the stability of the income velocity of money and of its independence on the rate of interest, what accounts to equivalently accept that the demand for money is an unstable function of real income, and that the economy's financial structure is subject to continuous financial innovations in response to (tight) monetary policies; and above all, (iii) the rejection of the causal arrow of the quantity theory which goes from money supply to nominal income ($M \Rightarrow Y$) in favour of the opposite direction ($Y \Rightarrow M$) from nominal income to money supply.

While there is plenty historical evidence in support of (i) and (ii), though as argued by the author many Post Keynesian economists disregard the second, it is the interpretation of the third point which generates the most profound debate among Post Keynesian economists. In the view of Rousseas' (1986), the most extreme version of the third point, regards to it as implying that: "...any increase in nominal income causes an increase in the supply of money sufficient to accommodate the resulting increase in the demand for money". He refers to this "most extreme" version as "*full accommodation*", arguing that:

> The critical question is whether the supply of money fully and automatically accommodates any increase in the demand for it or whether it does so only partially, with changes in the income velocity making up a part or all of the shortfall. If the former is the case, as indeed some Post Keynesian « monetarists» believe it to be, then the theory of an endogenous money supply implies its own version of Say's law as applied, in reverse, to the monetary sector, namely that demand creates its own supply. If the latter is the case, the argument is more complicated but less simple-minded and less subject to controversy –while attaining essentially the same results, although posing at the same time a critical problem for the continued viability of capitalism that the proponents of the Say's law in reverse avoid by recourse to their own Post Keynesian version of the neoclassical fine-tune hypothesis. [Rousseas, 1986, 74; italics supplied].

Thus, as previously argued major discrepancies within Post Keynesianism concern whether *full accommodation* takes place or not. Jarsulic (1989: 37) identifies as well the disagreement that has taken place among those economists who have tried to develop a Keynesian perspective of money and finance. The author argues that Robinson and Eatwell (1973: 218-219) and Davidson (1972: 246-281) have stressed the relevance of banks' decisions for the investment process. From this perspective, banks' willingness to supply the flow of credit needed for the increase in investment is viewed as a necessary if not sufficient condition for the success of the economy. Indeed, Davidson (1972) points out that:

> If additional finance is to be obtained, and if the banks are unwilling to create it, then some members of the community must be induced to give up some of their portfolio money holdings in exchange for securities, if entrepreneurs are to carry through their orders of fixed capital goods. Hence the market price of securities must initially fall [the rate of interest must rise]...Of course, the equilibrium level of output in t+1 will be lower and the interest rate higher than if money supplied had expanded in pace with the additional investment demand. [Davidson, 1986: 279; italics supplied].

Jarsulic (1989: 37) implicitly places Kaldor (1982) and Moore (1983, 1985) in the list of Horizontalist Post Keynesian economists when he argues that they usually regard to the money supply as a passive demand-driven magnitude, so that accumulation can only be constrained to the extent that the cost of reserves exogenously determined by the central bank affects the market rate of interest. The next subsection deals more profoundly with the view of The Horizontalist Approach.

6.1The Horizontalist Approach

In the previous section it was argued that one of the many crucial contributions of Keynes' was the introduction of the notion of the "finance motive". Instead of focussing its attention on the stock of money balances, it concentrates on the flow-of-credit demand for money. For Kaldor (1982), Lavoie (1992), Moore (1983, 1988a. 1988b), Rochon (2001) and many others, the response of the money supply to changes in the demand for it is seen as perfectly elastic. That is the short-run money supply curve is conceived as horizontal for any given level of the short-term interest rate. This section examines such a perspective.

As argued by Moore (1983), the historical evidence suggests that the ability of the FED to control the rate at which bank credit expands is extremely limited. Moreover, he argues that the behaviour of money wages, both because of being the greatest component of firms' working capital and because of being a major determinant of disposable personal income, is crucial to the determination of private demand for bank credit.

Moore (1983) sustains as well that, the central bank, in accordance to its objectives of providing support to the financial system, seems to tolerate the accommodation of the money stock to increases in the demand for bank credit; "Whenever money wages are rising rapidly, it will prove very difficult for the Federal Reserve to restrict the rate of monetary growth...The economics profession in general must come round to the view that the supply of money is horizontal at every going short-term interest rate" (Moore, 1983: 555).

More emphatically, he upholds that as the quantity of money is always demand-determined, there can never be an "excess" supply of money balances. Moreover, from his viewpoint, bank reserves cannot be quantity rationed; central banks can set the short-term interest at which they will provide liquidity, but the overall level of the money stock is out of their control.

In a posterior article, Moore (1988a: 381) argues that the money supply is endogenously determined, and that credit money is credit driven in the sense that loans generate deposits rather than the contrary. Moreover, he asserts that in all modern economies, as long as borrowers have access to large unused overdraft facilities, the amounts of loans outstanding are determined by bank borrowers and not by banks themselves. Thus, as long as money is accepted in exchange for non-monetary goods and services, the supply of credit money is as well demand determined; there is no such "excess" supply of money; rather money supply and demand are interdependent.

In his view, banks are price setters and quantity takers in both their retail loan and their deposit markets; so both loans and deposits are demand driven. The mark-up of the loan rate over the deposit rate must cover costs and targeted profits; and the amount of total loans and deposits demanded must preserve some desired ratio, which at the aggregate level of the banking system should not deviate far from unity.

Thus, as indicated by Moore (1988a), provided that banks' loan collateral standards are met, any increase in the demand for bank credit will simultaneously result in an increase in loans and deposits. As these deposits are spent by borrowers, either in the purchase of financial or real assets, the providers of these goods, including workers, will accept bank money in exchange; so as long as bank deposits preserve moneyness –which in terms of Screpanti (1993) would imply the acceptability of bank money as means of exchange for goods and services– bank deposits will always be demanded.

Thus, as plainly indicated by Moore (1988a), all economic agents who receive credit money (bank deposits) in exchange for real and financial goods and services are indeed selling those goods and services on credit. They are willing to accept and increase their holdings of deposits, and hence to expand their "convenience lending" to banks only provided they expect all other economic agents will do the same. It is precisely the fact that such "convenience lending" requires no sacrifice of contemporaneous consumption or investment expenditures what results in the absence of any need to incur additional interest "bribe"; "*There is no need for the supply of credit money to be upward sloping*" (Moore, 1988a: 382).

Moore (1988a) argues as well that, for both, individual banks and the banking system as a whole, any short-run excess or deficiency of the demand for loans over the deposit supply of funds will be taken care in the wholesale markets (e.g. CDs, TBs, etc.) in which, as opposed to the case of the loans and deposit markets, banks are price takers and quantity setters. Over longer runs, instead, Moore (1988a) argues that the lending and deposit rates will be adjusted so as to guarantee that the total amount of loans supplied to borrowers is approximately equal to the total amount of deposits received from lenders.

For Moore (1988a), the marginal and average cost of wholesale assets is identical. Consequently, banks –at least in particular markets– set their lending rates to the extent allowed by their market power as a mark-up over the wholesale rate. Additionally, as the marginal cost of funds to banks is primarily dependent upon the supply price of bank reserves which, in turn, in the closed economy, is mainly exogenously set by the central bank, reserves must always be endogenously supplied.

In the case of the open economy, Moore (1988a: 383) argues that as bank reserves may also be provided from outside the system at a supply price which is set by foreign central banks, national central banks must determine the exchange rate as well as the local interest rate at the same time. Thus, while whenever a flexible exchange rate regime is in place the central bank enjoys greater freedom to set the domestic rate, when a fixed exchange rate regime is chosen, central banks loose control over short-rates unless they resort to exchange controls. The previous argument is also found in Mata (2003) and Wray (2004). The former, in the case of open developing economies and in order to gain control over monetary policy, proposes the implementation of a flexible exchange rate regime under *Financial Bimonetarism* and currency-matching rules later described in García (2004)[28].

For Moore (1988a), the money supply endogeneity is misunderstood by many who interpret it as implying the passivity of the central bank in the sense that the monetary authority is unable to affect the money growth. He argues that: "An endogenous money supply simply denotes that the money supply is determined by market forces" Moore (1988a: 384). In his view central banks are still capable

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[28] García (2004) does not argue in favour of full liability de-dollarisation. Instead in García (2004), the establishment of a currency-matching rule is advocated for the case of small open economies in order to guarantee that foreign currency-denominated bank loans are uniquely offered to the export business sector. The proposal aims at eliminating balance sheet problems and currency mismatches at both the corporate level and the bank level. The paper shows that both the control over the short-term rate and the benefits of asset partial dollarisation may be simultaneously retained.

of administering the level of short-term interest rates in an exogenous way. This is in turn, he argues, may still allow affecting the level of credit and money demanded and therefore, indirectly, the behaviour of money growth.

Moreover, it is argued that money supply endogeneity implies the central bank pegs the short-term interest rate indefinitely over time; and that since this has not been always observed, money supply endogeneity corresponds to a particular short historical period of time. In opposition to that Moore (1988a) sustains that this is a misconception, in the sense, it is not true that money supply endogeneity requires indefinite short-term interest rate pegging. Rather, central banks usually adjust the short-term rate depending on their view regarding the state of the economy, as well as depending on their objectives regarding their monetary policy.

Furthermore, Moore (1988a: 384) argues that "...a long-run money supply curve does not exist, since the level of interest rates cannot be specified independently of demand conditions. But the central point is that the short-run money supply curve is always horizontal...Only once it is fully comprehended that the supply of credit money is inherently endogenous and that the money supply function should be viewed as *horizontal* in the interest-money space, at a level of short term interest rates established by the central bank, can the base-multiplier relationship be understood for what it is: a pure descriptive tautology...". This view is shared as well by Rochon (1999, 2001).

Rochon (2001) argues that the very initial contributions by Minsky (1957a, 1957b) and Kaldor (1958) focused on the instability of the income velocity of money under an exogenous money supply assumption. Their purpose was to question the view that inflation was a monetary phenomenon, but as well to argue that financial innovations allowed banks to economise on reserves and hence to supply new loans.

In the view of Rochon (2001), the problem with the above argument is that it implied that the causality between savings and investment was not broken. Moreover, he argues that: "*The argument that output can be financed through a change in the velocity of money is not consistent with a theory of endogenous money since it re-establishes the Quantity Theory of Money*" (Rochon, 2001: 290; italics supplied).

Furthermore, he argues that as loans are placed and deposits are created, money supply increases, but: "In fact, banks only seek reserves after they have made loans and created deposits. Consequently, reserves do not constrain the ability of banks to make loans." (Rochon, 2001: 293). Equivalently, Moore (1989: 12) argues that: 'Since reserves are ordinarily supplied endogenously on

demand, they have no causal role in the money supply process". Additionally, Hewitson (1995: 287) sustains that "loans are made, deposits are created, and banks only later seek the reserve assets required to support these deposits and meet reserve requirements".

Rochon (1999, 2001) argues that even if the central bank does not fully accommodate, money is still fully endogenous; "banks are generally not constrained in terms of their reserves" (Rochon, 2001: 293). Equivalently, Kaldor (1982) holds that to a greater or lesser degree central banks will in general meet the demand for reserves. Forman et al. (1985: 30) sustain that: "The central bank, in order to maintain the liquidity of the financial system, is forced to purchase government securities in the open market so as to accommodate, at least in part, the need for additional credit as the pace of economic activity quickens". Moreover, as argued by Rochon (2001: 293) when referring to Moore (1988b) and Palley (1991) respectively: "At the very limit, banks can borrow reserves from the central bank, albeit at a 'frown cost'...They can even borrow them from other banks in overnight markets".

Thus, as in Kaldor (1982), Moore (1988b), Lavoie (1992), Rochon (2001) and many others, the full accommodation approach views the endogenous money supply as regularly characterised by a given interest rate on bank loans with a horizontal line as its best graphical representation. Furthermore, as argued by Thirlwall (2000: 14): "Credit-money only comes into existence if it is demanded, so that in a pure credit money economy, supply can never be in excess of the amount individuals wish to hold".

In short, the Horizontalist Approach may be summarised as in Rochon (2001): (i) the direction of causality of the quantity theory is reversed so that it runs instead from firms' expected income to demand for credit, and then from money to effective income; (ii) the causality between reserves, deposits and loans is reversed so that loans create deposits and hence reserves are endogenous as in Pollin (1991), Lavoie (1992) and Eichner (1987); (iii) firms first finance production and then savings are generated, so that the direction of causality between savings and investment is as well reversed as in Kregel (1973), Davidson (1972) and Shapiro (1977); (iv) the interest rate is not determined by supply and demand schedules, and hence is exogenous as in Lavoie (1996), Hewitson (1995), Smithin (1994) and Wray (1995); (v) the supply of credit is endogenous and money is a continuous credit-driven circular flow which is destroyed through the repayment of loans as in Eichner (1987), Lavoie (1992) and Parguez (1984, 1987).

6.2 The Circuit Approach

The Circuit Approach is essentially represented by the so-called French-Italian School. Some major contributions are Cencini (1984, 1988) and Graziani (1989)[29]. Circuit theorists usually emphasise the primary role of money as being a means of payment making the circulation of commodities possible. Thus, when money is kept idle, it is considered a stock of wealth but not as an instrument of circulation. As argued by Graziani (1989: 4): "In principle, in a perfect competitive credit market, no one would borrow money from a bank before a payment comes due. This is the simple consequence of assuming rational behaviour, since there would be no point in borrowing money and paying interest on it while keeping it idle. Money therefore *only comes into existence the moment a payment is made*".

In the view of Graziani (1989), the presence of commodity money is inconsistent with a true monetary system. "The ideal model of the theory of the circuit therefore resembles the so-called Wicksellian[30] model of a pure credit money, with the addition of a Central Bank" Graziani (1989: 3). Moreover, he argues that the existence of money requires: (i) the presence of a token currency (e.g. paper currency); (ii) the acceptance of money as a "means of final settlement"; and (iii) that money must not provide seignorage privileges to any payee. He argues this is satisfied when payments are made by means of "promises of a third agent", namely banks. Thus, in terms of Graziani (1989), any monetary payment must involve a triangular transaction between a payer, a payee, and a bank.

In the Circuit Approach, money is as well a strict endogenous variable. Money is created in response to the firms' needs of finance in order to pay for wages and means of production. Thus, as sustained by Graziani (1989), initial finance must cover current costs of production.

For the theorists of the circuit, fixed investment finance is not supplied by banks; rather firms' fixed investments require a final finance which is derived from the proceeds from sales or from new issues on the financial market. As explained by Graziani (1989: 8), "What matters to firms is that *final finance be sufficient to cover total initial finance*". When this occurs firms are able to repay their debts to the banks and money is destroyed. Thus, under this viewpoint it does not matter if money comes from consumption or from savings. However, it must be clear, that: "Only under the very special assumptions of the neo-classical

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[29] Graziani (1989) suggests as well the contributions in French by Schmitt (1984, 1986) and Parguez (1975, 1981).

[30] See Wicksell (1898).

equilibrium, proceeds from issues on the financial market equal the monetary value of investment, so that investment appears to be financed by means of long-term issues" (Graziani 1989: 21).

Thus, just as argued by Rochon (1997) money is different than credit, in the sense that credit is an ex-ante instrument which allows production to take place, and money is an ex-post variable which appears only when credit is used by firms. In Rochon (1997: 281), the demand for credit is different than the demand for money; and they are conceived as independent of each other: "It is, in fact, quite conceivable for the demand for money to be nil, while it is never the case that the demand for credit is nil". The latter is a stock concept and the former is a flows notion.

As sustained by Rochon (1997), credit is the starting point whose end is the destruction of money. The circuit period entails no time; investment plans start the process leading to a demand for credit, which in turn, as credit is used leads to the creation of money, and finally to the reimbursement of debt and destruction of money. Thus, bank credit is utilised in order to allow production take place, and savings as well as collections from sales are used as way of reimbursing the initial debt. From this viewpoint, contrary to the views which consider Keynes' finance motive either as an extra amendment or addition to the regular demand for money, as fourth motive for holding money, or simply as an extra source of money demand taking place during expansions, for the Circuit Approach, when the circuit closes, the initial finance has already been used and destroyed so that new credit must be demanded and used in order to start a new cycle.

6.3 The Partial Accommodation Approach

> The links between money and investment occur in two ways. Portfolios hold monetary assets, liabilities of financial institutions, as protection against contingencies, as well as assets, or claims upon assets, that enter into production. Secondly, investment spending has to be financed. [Minsky, 1991: 210; italics supplied].

As sustained by Rousseas (1986), Weintraub's explanation for the endogeneity of money is a consequence of his wage theory[31]. For a given level of real output, any increase of wages over the level of average productivity will give rise to a proportional increase in nominal output and prices. This, in turn leads to a higher transactions demand for money (credit), which as assumed by Weintraub, under a constant velocity of circulation, it must be the case that it is

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[31] See Weintraub (1978a, 1978b).

fully accommodated by the central bank if real output is to be kept constant. Thus, under a stable velocity of circulation, failure of accommodation, be it none or partial, would result in a higher price level and lower output (stagflation).

Rousseas (1986) sustains that in this framework, it is assumed the central bank can prevent an increase in the money supply. The reason for that is the critical assumption associated to the presence of a constant velocity of circulation. Thus, the traditional link between money supply and income cannot be said to be effectively broken. The causal link is just *politically* broken when it is assumed that the central bank fully accommodates the "needs of trade" in the face of political pressures exercised by those leaders responsible for full employment[32].

Rousseas (1986), Pollin (1991), and Palley (1991) disapprove the uncritical acceptance of the extreme position pioneered by Nicholas Kaldor. Such a position is based on the role of lender of last resort, which leads as well to a perfectly elastic money supply curve at any interest rate level set by the central bank. Succinctly, it argues that central bank's main responsibility is to guarantee the solvency of the financial system. As critically described by Rousseas (1986: 78): "Acting as a lender of last resort through the discount window (the bank rate), the central bank gets hoisted on its own petard. To prevent credit crunches from turning into disastrous debt deflations, the monetary authorities have no choice but to accommodate the 'needs of trade'".

In the view of Rousseas (1986), Weintraub's political argument in favour of full accommodation is substituted by Kaldor's emphasis on the lender of last resort role of the central bank. Rousseas (1986: 82) labels both approaches as a *Post Keynesian version of the neoclassical fine tuning*.

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[32] In Weintraub's model changes in the price level respond to changes in unit labour costs. The money supply is linked to real output and employment. Thus prices are a function of wages which in turn are predetermined by social bargaining; thus monetary policy can only affect prices indirectly whenever the central bank does not fully accommodate the demand for money, and hence when it brings about unemployment leading to a tampering of wage demands. For Weintraub, this is only possible in the case the central bank is able to defy the pressure exercised by political authorities. As argued by Rousseas (1986), Weintraub (1978b: 193) pulls back from the notion of full accommodation indicating that money supply endogeneity "may not be complete; it has been erratic and only intermittently predictable. Nevertheless it exists, though the relationship is not readily captured in a tidy analytical model". Moreover he argued that the extent of predictability of accommodation would entail information on the "psychological profile of the MA personalities and staff". Just as argued by Rousseas (1986: 85) prediction is simply not possible, and the degree of accommodation will change under different circumstances and pressures, and "...*with the response of the private financial sector in defiance of the policies pursued by the monetary authorities*".

Rousseas (1986, 86) when referring to Kaldor's *full accommodation position* argues that: "In the case of Kaldor, the exogenous interest rate coupled with a lender of last resort function of the central bank severs the Keynesian link between velocity and the rate of interest". Subsequently, when referring to Kaldor's acceptance of potential *partial accommodation*, he argues that Kaldor assumes that changes in the stock of money and changes in velocity are perfect substitutes, so that "...For Kaldor, any shortfall in the increase in the supply of money will be met in full by a rise in velocity to 'make up the difference', i.e., the *adjusted* or *effective* supply of money curve would be perfectly elastic and hence horizontal to the money axis".

In response to the previous arguments by Kaldor, Rousseas questions it by arguing that: "If, however, money and the income velocity of money are less than perfect substitutes, if, in other words, the velocity increase does not fully 'make up the difference', then the endogeneity of money does not imply a perfectly elastic or horizontal supply curve of money, and the relation of velocity to the rate of interest becomes an important consideration to be taken explicitly in any reformulation of an endogenous theory of the money supply, i.e., the rate of interest is no longer exogenously determined by the central bank and severed from the income velocity of money, as it is Kaldor's theory of endogeneity via the lender of last resort argument".

Rousseas (1986, 1989) proposes a less extreme Post Keynesian approach to the endogenous money supply. He argues that the theory of endogenous money supply must incorporate changes in the velocity of circulation as part of its rationalisation. He suggests a different graphical representation than the horizontal Post Keynesian approach and the vertical Monetarist approach (See Appendix). Following diverse contributions by Minsky, changes in velocity in response to higher interest rates are decomposed. On the one hand, movements along the velocity curve are considered as a demand-side result from the activation of idle balances and the economising of transaction balances. On the other, shifts of the velocity curve represent supply-side financial innovations taking place during long-lasting expansions, or simply as a reaction to extremely tightening monetary policies.

6.4 Post Keynesianism and Reconciliation

When referring to the discrepancies among the Horizontalists and Structuralists, Post Keynesian economist Wray comments: "*For the most part, I believe this particular debate was at best a result of misunderstanding, and I wish it had died a more timely death*" (Wray, 2004: 1; italics supplied).

Wray (2004) reviews the positions of Horizontalists and Structuralists. He argues that while both accept the view that the money supply should be treated as an endogenous variable, the latter do not believe the interest rate should be taken as exogenous[33].

Wray (2004) identifies four reasons why central banks accommodate the demand for reserves. Referring to Moore (1991), he argues the first reason is the lagged and contemporaneous reserve accounting. It implies that the level of reserves that must be maintained depends to a greater or less extent on past levels of deposits. As "the required portfolio adjustment could be too great", the central bank must, in practice, provide an automatic overdraft at the discount rate. A second, and in his view, "less satisfying" rationale for accommodation is that related to the lender of last resort role; the preservation of stability within the financial system. As argued by Wray (2004), "The problem with this explanation is that while it is undoubtedly true, it applies to a different time dimension...It would presumably take some time before refusal to accommodate the demand for reserves would be likely to generate the conditions in which bank runs and financial crises begin to occur. Once these occurred, the central bank would surely enter as a lender of last resort, but this is a different matter from the daily 'horizontal' accommodation".

The third explanation, which Wray (2004) finds more plausibly applicable "to the time frame over which accommodation takes place" is that associated to the need of maintaining an "orderly payment system". He argues, par clearing within the banking system and with the government demands opportune access to reserves. The fourth argument explained by Wray (2004) is that concerning the relative stability of the overnight interest rate. In absence of accommodation such a rate would be highly unstable due to the inelasticity of the demand for reserves as well as due to the fact that the private supply cannot be increased.

Regarding the major discrepancy among Post Keynesians, namely the exogeneity of the interest rates, Wray (2004) contributes by identifying which interest rates could be said to be exogenous in the control sense; that is which

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[33] Wray (2004) discusses on the different meanings of exogeneity. He argues that the definition most commonly adopted by Post Keynesians economists is that related to "the control sense: an exogenous variable is one whose value is set by government policy". A second meaning is that associated to causality; while a strongly exogenous variable must be independent of all other variables in a system, a weakly exogenous variable need only be independent of contemporaneous values of the endogenous variables, but may depend on their lagged values. The third definition of exogeneity he considers is related to the statistical sense; a variable is exogenous when it is independent of all unobserved explanatory variables of the model, and hence when it leads to unbiased estimates.

interest rates could be said to be fixed or directly controlled by the central bank. Firstly, he agrees –in terms of Moore– with the fact that the overnight rate is exogenously administered by the central bank. He argues as well that provided short-term sovereign debt is a good substitute of overnight reserve lending, the latter should closely track the former. Moreover, he argues that as long-term rates on sovereign debt greatly depend on expectations regarding the short-term rate and hence regarding the future course of monetary policy, they could be said to be largely affected by the central bank if it could announce its planned targets far into the future.

Additionally, Wray (2004) sustains that once risk considerations are accounted for, whether or not commercial bank rates on loans and deposits ought to be considered as exogenous –in the control sense– depends on the reaction of the mark-up (and mark-down). If the mark-up is itself independent of changes in monetary policy, then the central bank could straightforwardly affect the loan rate so as to reach any higher target. However, as sustained by Wray (2004) if the mark-up is not constant over time, perhaps, due to micro and macroeconomic reasons, then the complexity of the administration of loan rates increases; although, provided the central bank's rate cannot go below zero, the lower bound of the loan rate is the mark-up itself.

Wray (2004) comments on the criticisms raised against the Horizontalist position when the variability of the mark-up reacts to micro factors such as the state of the balance sheets of individual banks and particular borrowers as well as to overall macroeconomic factors associated with the state of the business cycle: " It is true that Moore does not deny that the mark-up might be variable -and I am sure he will agree that it can vary over the cycle– rising with pessimism and falling with optimism. This could even be seen as a reclassification of risks...Moore's horizontal loan supply curve is at a point in time, while theirs is a plot of interest rates over time. Moore's horizontalism is not inconsistent with a rising mark-up over time as risks in the economy increase, and the structuralist concern with innovation and evolution of practice can be incorporated within Moore's framework...the point that Hyman Minsky had tried to make is that over an expansion, and under some conditions, the balance sheets of both borrowers and lenders can become 'stretched' in such a way that loan rates tend to rise; this can be construed as either an upward sloping trend or as shifts due to rising risk".

Additionally, Wray (2004) admits that while it is true that households hold credit cards with pre-authorised credit limits and that corporate firms, as well, negotiate credit lines with their banks, it is also true that in both cases, full utilisation of the credit limits will certainly affect rates and fees charged on additional borrowing. He attributes this to a "transition to riskier classes". He acknowledges as well that commercial and mortgage loans entail individual negotiations and possibly variable

rates depending on institutional arrangements, with "loan quantities and uses carefully established at the time interest rates are quoted".

A further contribution which is as well aimed at reconciling the Horizontalist and Structuralist positions is that by Screpanti (1997). He derives a rising money supply curve based on what he labels "a reformulation of Kalecki's increasing risk hypothesis"[34]. In such a framework, the limit to credit expansion is based neither on rising marginal costs nor institutional constraints; rather he argues: "it is the very effect of credit expansion on the degree of risk that will impose those limitations...their main concern is to choose the level of activity and the composition of assets and liabilities so as to balance expected profits and perceived risks" (Screpanti, 1997: 573).

The above setting captures the relevance of banks' balance sheets and risks in the determination of loan and price policies. Precisely, it presents the risks borne by the bank in the form of a liquidity and solvency risk. Although it is assumed banks are price setters in both the deposit and loan markets, mark-ups are considered as fixed but adjustable, in the sense that: "the relationship existing between loan rates and the discount and deposit rates is no so strict as conventional mark up theories maintain...This is specially true when risk conditions change" Screpanti (1997: 574). Particularly he argues that banks control the spread in order to deal with increasing risk.

Thus, for a given cost of attracting reserves, the implicit mark up reacts upwards when both the bank's risk and its preference for money increase[35]. Precisely, for a given level or quantity of reserves, as loans, and consequently deposits, expand, the spread between credit and debit rates becomes wider. The same occurs as well when, for a given effective reserve ratio, the bank's subjective preference for money (risk aversion) increases. Thus, when bank risks increase, they resort to mark up increases in order to both, curtail the demand for loans, and prevent further reductions on the effective reserve ratio.

Succinctly, Screpanti's (1997) structural theory of endogenous money considers the short-run adaptation of supply to demand at the expense of interest

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[34] Screpanti (1997) associates the core of banking with the *transformation of generic risk by bearing part of it*. See Kalecki (1937).

[35] The preference for money, as argued by Screpanti (1997) is a measure of the bank's degree of risk aversion; the greater the preference for money the greater the desired reserve ratio. See Subsection 5.3 for the precise definition as in Screpanti (1993, 1997).

rate increases in the presence of expanding risk[36]. He shows that as long as the time horizon is properly identified, the Horizontalist approach to endogeneity becomes comparable to the accommodative approach. Moreover, he argues that, while in the short-run, supply could fully accommodate demand if banks are sluggish in modifying rates, in the long-run, the same could occur when central banks are unwilling to repress the banking system, or simply when financial innovations emerge as a reaction to monetary tightening.

7. Final Remarks

- There is no room neither for money nor banks in General or Partial Equilibrium models and approaches based on the walrasian and Arrow-Debreu worlds. This is corroborated by Hahn (1981), and it is no surprise for Post Keynesian economists (Davidson, 1988).
- The Industrial Organisation approach to banking, which is mainly based on the idea of the opportunity to save on non-informational transaction costs (e.g. transportation costs), is well suited to partially contribute to the explanation for the initial emergence of national and international physical depository and payment services, an hence, to explain the emergence of primitive financial intermediaries (Freixas and Rochet, 1997).
- However, as such a theory innocently considers banks as financial intermediaries and security retailers, it, unsurprisingly, does not capture the complexities of money and banking.
- Under asymmetric information –e.g. under the presence of private or hidden information– the contemporary theory of financial intermediation is mainly grounded on the opportunity to save on informational transaction costs through ex-ante screening (to reduce adverse selection), prevention of opportunistic behaviour (to reduce moral hazard), and ex-post punishing and auditing (to reduce costly state verification).
- On that ground, such as theory has greatly contributed to the explanation for the existence and persistence of financial intermediaries as a response to the incapability of the market-based mechanisms in efficiently dealing with informational problems, and therefore in providing full diversification and risk-sharing (Bhattacharya and Thakor, 1993).

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[36] Screpanti (1997) considers four different cases of adaptation depending on: (i) if banks try to follow demand; (ii) if banks try to encourage it; (iii) if they rather try to enliven reserves; and finally, (iv) if they try to attract reserves.

However, as it is the case of the Industrial Organisation approach to banking, the contemporary theory of financial intermediation fails as well to disentangle the core of the banking business from that of financial intermediation which, mainly due to scope economies, is as well performed by banks. The theory of financial intermediation mostly deals with specific risks associated to private information, and therefore cannot capture the implications of generic risk for the existence of banks and money.

Banks besides being efficiently prepared to carry out the task of managing specific risks –what is done as well by financial intermediaries, brokers and others– banks are especially endowed to play a role which is not only essential but it is as well particular to them; "they take upon themselves the generic risk of their debtors and transform into a bank wealth [insolvency] and liquidity risk...*Banks make the generic credit risk saleable*" (Screpanti, 1997: 571; italics added).

To transform risky, illiquid, nonmarketable assets (personal credit) into safe, liquid, and marketable money assets (e.g. deposits), four fundamental risk transformation instruments are used by banks: (i) base money and quasi-money reserves; (ii) liability insurance –e.g. deposit insurance, and hedging instruments; (iii) they may enjoy the benefits from the membership to a network of relationships with other banks, allowing for the provision of mutual assistance and therefore for the socialisation of part of the risks– e.g. interbank markets, etc.; (iv) they may belong as well to a system of banks led by a central authority playing the role of lender of last resort; and (v) and above all, they bear part of the risk by investing their own capital and reserves into the business (Screpanti, 1993, 1997).

The major economic consequences of the use of the above set of risk transformation instruments are that: (i) banks' insolvency risks are publicly perceived as very low; (ii) for the previous reason, the public is willing to accept bank money (e.g. deposits and liabilities); and (iii) banks are able to profit from charging relatively high rates for their risky assets while paying relative low rates for their safe liabilities. "*The business of banks consists of transforming potential credit into money*" (Screpanti, 1993: 123).

Davidson (1982-1983) argues that (i) in an economy which moves through calendar time, and (ii) in a world in which uncertainty about the future cannot be reduced to an "ergodic random draw from a given and unchanging probability distribution", and (iii) as "...production takes time", the optimal way to organize the production process is through the use of forward monetary contracts (Davidson, 1988).

Moreover Davidson (1988) argues that it is precisely the consciousness about calendar time, the uncertainty about the future, and the fact that production itself is time-consuming what creates a need for liquidity.

For the previous reason, productive firms hold money balances at a rather low level, but to some extent in a fixed or stable ratio to the expected long-run flow of production. Moreover, this minimum reservation level for money holdings is insensitive to: changes in interest rates and short-run fluctuations in output–demand (Screpanti, 1993).

As previously argued, banks hold primary reserves of monetary base but additionally, they hold secondary reserves in the form of quasi-money. Primary reserves are accepted for immediate compensation, but yield no income. Secondary reserves must first be monetised if they want to be used for clearing, but they do yield an interest, though inferior to that of loans.

As argued by Screpanti (1993) under such circumstances, the reserve ratio depends on three major factors. Firstly, it depends on the subjective or psychological preference for money. Secondly, it depends on the objective or market based rate of return on assets. And, thirdly, it depends on various institutional elements such as: the degree of organisation of the money market, and the financial and monetary policy of the central bank.

Thus, while for the case of the public both households (creditors) and firms (debtors), the major concern is the maturity composition of their assets and liabilities respectively, for the case of banks, the major concern is the ratio between primary reserves and deposits. This is true because bank's liabilities mainly consist of liquid obligations–e.g. deposits, interbank loans, etc. Thus, quasi-money itself cannot suffice to provide psychological relief (Screpanti, 1993).

As argued by Screpanti (1993), banks are not only concerned about illiquidity. They are also concerned about the possibility of not being able to recover the whole value of their credit loans. As safeguard, banks hold capital and pay close attention to the evolution of their debt to assets ratio.

Banks' capital as well forms fundamental part of the banks' precautionary behaviour; it is both a signal of their ability to generate profits but as well a buffer against possible losses and insolvencies. A low capital to assets ratio represents a condition of high profitability but as well of high exposure.

Regarding money supply, exogeneity implies that the central bank –in response to changes in the demand for money and by making use of open market operations, the discount rate, and reserve requirements– has the ability to adjust the economy's overall volume of money so as to bring it to that particular level corresponding to its policy objectives. *This is completely refuted by all Post Keynesian economists* (Rousseas, 1986).

A complete theory of endogenous money supply entails: (i) the rejection of the notion of the natural tendency toward a long-run full-employment

equilibrium –or the acceptance of inherent instability of capitalism; (ii) the rejection of the stability of the income velocity of money and of its independence on the rate of interest– accepting that the demand for money is an unstable function of real income, and that the economy's financial structure is subject to continuous financial innovations in response to (tight) monetary policies; and above all, (iii) the rejection of the causal arrow of the quantity theory which goes from money supply to nominal income ($M \Rightarrow Y$) in favour of the opposite direction from nominal income to money supply ($Y \Rightarrow M$) (Rousseas, 1986: 73).

- While there is plenty historical evidence in support of (i) and (ii), it is the third point which generates the most profound debate among Post Keynesian economists. In the view of Rousseas (1986), the most extreme version of the third point refers to it as implying that: "...any increase in nominal income causes an increase in the supply of money sufficient to accommodate the resulting increase in the demand for money". He refers to "the most extreme" version as "*full accommodation*".

- All economic agents who accept credit money (bank deposits) in exchange for real and financial goods and services are indeed selling those goods and services on credit; and hence increasing their "convenience lending" to banks. It is precisely the fact that such "convenience lending" requires no sacrifice of consumption or investment expenditures, what results in the absence of any need to incur additional interest "bribe"; "*There is no need for the supply of credit money to be upward sloping*" (Moore, 1988a: 382).

- For Moore (1988a), the money supply endogeneity is misunderstood by many who interpret it as implying the passivity of the central bank in the sense that the monetary authority is unable to affect the money growth. He argues that: "An endogenous money supply simply denotes that the money supply is determined by market forces" Moore (1988a: 384). In his view central banks are still capable of administering the level of short-term interest rates in an exogenous way. This is in turn, he argues, may still allow affecting the level of credit and money demanded and therefore, indirectly, the behaviour of money growth.

- "...A long-run money supply curve does not exist, since the level of interest rates cannot be specified independently of demand conditions. But the central point is that the short-run money supply curve is always horizontal...in the interest-money space, at a level of short term interest rates established by the central bank..." (Moore 1988a: 384).

- The Horizontalist Approach may be summarised as in Rochon (2001): (i) the direction of causality of the quantity theory is reversed so that it runs instead from firms' expected income to demand for credit, and then from money to

effective income; (ii) the causality between reserves, deposits and loans is reversed so that loans create deposits and hence reserves are endogenous as in Pollin (1991), Lavoie (1992) and Eichner (1987); (iii) firms first finance production and then savings are generated, so that the direction of causality between savings and investment is as well reversed as in Kregel (1973), Davidson (1972) and Shapiro (1977); (iv) the interest rate is not determined by supply and demand schedules, and hence is exogenous as in Lavoie (1996), Hewitson (1995), Smithin (1994) and Wray (1995); and (v) the supply of credit is endogenous and money is a continuous credit-driven circular flow which is destroyed through the repayment of loans as in Eichner (1987), Lavoie (1992) and Parguez (1984, 1987).

- From the viewpoint of the Circuit approach, the existence of money requires: (i) the presence of a token currency (e.g. paper currency); (ii) the acceptance of money as a "means of final settlement"; and (iii) that money must not provide seignorage privileges to any payee. Graziani (1989) argues this is satisfied when payments are made by means of "promises of a third agent", namely banks. Thus, any monetary payment must involve a triangular transaction between a payer, a payee, and a bank.

- As sustained by Rochon (1997), credit is the starting point whose end is the destruction of money. The circuit period entails no time; investment plans leads to a demand for credit, this in turn, to money creation, and finally to the reimbursement of debt and destruction of money.

- Thus, bank credit is utilised in order to allow production take place, and savings as well as collections from sales are used as way of reimbursing the initial debt. For the Circuit Approach, when the circuit closes, the initial finance has already been used and destroyed so that new credit must be demanded and used in order to start a new cycle.

- Rousseas (1986, 1989) proposes a less extreme Post Keynesian approach to the endogenous money supply. He argues that the theory of endogenous money supply must incorporate changes in the velocity of circulation as part of its rationalisation.

- He suggests a different graphical representation than the horizontal Post Keynesian approach and the vertical Monetarist approach. Following diverse contributions by Minsky, changes in velocity in response to higher interest rates are decomposed. On the one hand, movements along the velocity curve are considered as a demand-side result from the activation of idle balances and the economising of transaction balances. On the other, shifts of the velocity curve represent supply-side financial innovations taking place during long-lasting expansions, or simply as a reaction to extremely tightening monetary policies.

As argued by Wray (2004): "Moore's horizontal loan supply curve is at a point in time, while theirs [the structuralists'] is a plot of interest rates over time. Moore's horizontalism is not inconsistent with a rising mark-up over time as risks in the economy increase, and the structuralist concern with innovation and evolution of practice can be incorporated within Moore's framework...the point that Hyman Minsky had tried to make is that over an expansion, and under some conditions, the balance sheets of both borrowers and lenders can become 'stretched' in such a way that loan rates tend to rise; this can be construed as either an upward sloping trend or as shifts due to rising risk".

Screpanti's (1997) structural theory of endogenous money may be seen as a contribution towards a reconciliation of the Horizontalist and Structuralist positions. It considers the short-run adaptation of supply to demand at the expense of interest rate increases in the presence of expanding risk. He shows that as long as the time horizon is properly identified, the Horizontalist approach to endogeneity becomes comparable to the accommodative approach. Moreover, he argues that, while in the short-run, supply could fully accommodate demand if banks are sluggish in modifying rates, in the long-run, the same could occur when central banks are unwilling to repress the banking system, or simply when financial innovations emerge as a reaction to monetary tightening.

8. Further Research

Clearly, there remain many potential areas of research associated with the study of endogenous money and banking. This section proposes some of the several possible investigations. One prospective area of research may be that leading to a deeper analysis regarding the adaptation of the money supply to demand, perhaps, as in the framework presented in Screpanti (1993, 1997) in which a reformulation of Kalecki's increasing risk hypothesis have proved to be crucial. Following the contributions by Minsky, a more insightful study of the cyclical evolution of the balance sheets of the average firm and the individual bank, will certainly lead to a deeper understanding of the implications of Minsky's financial instability hypothesis, and thus to a clearer interpretation of the consequences of increasing financial fragility.

As previously argued throughout this paper, banks' primary role, namely the creation of money, coexists with a secondary role associated with financial intermediation. Thus, the study of the interrelations among the two functions may contribute for the explanation of the adaptation of money supply to demand, perhaps by incorporating a more profound analysis of the role of bank liability and asset management.

Additionally, research conducted on the implications regarding the complexities of the institutional relations between banks, the rest of the financial sector, the central bank, and the fiscal sector, might be of great significance for both, the determination of the interest rate mark-up, and the overall level of the money supply.

Some economists argue that since 1973 with the collapse of the Bretton Woods agreement, several elements including the privatisation of the exchange rate risk (Eatwell and Taylor, 2000) have contributed to the continuing and accelerating growth of international capital markets. Many other Post Keynesians argue as well that money creation might not only respond to the demand for finance associated with real investment and production, but that it might react as well to financial speculative activities. Additionally, it is argued by Moore (1988a), Mata (2003), Wray (2004) and many other authors that the complexities regarding the exchange rate system are extremely relevant, as the short-term interest rate might become endogenous in the face of exchange rate pegging or fear of floating. Thus, the complexities of the coexistence of productive and financial speculative activities may prove as well to be a motivating research. Finally, the study of the evolutionary stability of banks and the co-evolution of international banking and money may lead to interesting results.

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APPENDIX

Graphical Representation of the Endogenous Money Supply when changes in velocity are incorporated (Rousseas, 1986):